

WARWICK OPEN SPACE AND RECREATION PLAN

2020 – 2027



Prepared by the Warwick Open Space Committee and
Warwick Town Forest Committee

with assistance from the

Franklin Regional Council of Governments

This project was funded by a Direct Local Technical Assistance Grant provided by the Massachusetts
Department of Housing and Community Development

TOWN OF WARWICK

OPEN SPACE AND RECREATION PLAN

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Prepared by the Warwick Open Space Committee (OSC) and Warwick Town Forest Committee (TFC):

George Day, Jr. (Chair, OSC)
Christine Duerring (Co-Chair, OSC; TFC)
Alan Berman (TFC)
Clare Green (OSC)
Mark Maynard (OSC)
Keith Ross (OSC; TFC)
Rod Whipple (TFC)
Mary Williamson (OSC; TFC)

With technical assistance provided by the

Franklin Regional Council of Governments
Planning Department
Peggy Sloan, Planning Director
Kimberly Noake MacPhee, Land Use and Natural Resources Program Manager
Alyssa Larose, Senior Land Use and Natural Resources Planner
Ryan Clary, Senior GIS Specialist
Benjamin Breger, Planning Intern



This project was funded by a Direct Local Technical Assistance Grant provided by the Massachusetts Department of Housing and Community Development

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SECTION 1

PLAN SUMMARY

The Warwick Open Space and Recreation Plan (OSRP) coalesces the interest, effort, and motivation of community members to identify, prioritize, conserve and protect Warwick's natural, recreational, cultural and historical resources. The purpose of the OSRP is to provide a framework for land use decisions and community planning efforts that may impact valuable natural resources and the lands that contain unique historical, recreational, and scenic values.

The 2020 Warwick Open Space and Recreation Plan reflects the high regard Warwick residents have for the forests, streams, wetlands, agricultural fields, scenic views, and significant historic and cultural resources that make the town unique. The OSRP illustrates the role that all undeveloped open spaces have in providing wildlife habitat and recreational opportunities and how appropriate economic development strategies, such as promoting agriculture and encouraging cottage industries, can help maintain the characteristics of the town that its residents cherish.

The Seven-Year Action Plan gives concrete substance to the goals and objectives, which were developed from the results of the 2019 Open Space and Recreation Survey and from community members' understanding of their Town's vast yet vulnerable natural resource base. The 2020 Warwick Open Space and Recreation Plan prioritizes actions that will help ensure that the Town of Warwick meets the following goals:

- Retains its rural, safe and quiet, small town character and sense of community, and its agricultural, cultural, historic and architectural resources.
- Maintains or improves the quality of its air and water, and the diversity and integrity of native fauna and flora through the conservation of locally important natural, open space.
- Maintains or improves the current quality, quantity, and accessibility of its recreational resources.
- Ensure the economic stability of the community by developing supportive infrastructure and encouraging economic activity compatible with the rural character of the town.

SECTION 2

INTRODUCTION

The Warwick Open Space Committee (OSC) began meeting with staff from the Franklin Regional Council of Governments in June 2018 to update the 2010 Open Space and Recreation Plan (OSRP), which had expired in January 2017. The collective knowledge of the Committee members about the town's flora, fauna, forests and cultural and historical resources has produced an updated Open Space and Recreation Plan that embodies the Town's commitment to protecting and enhancing its recreational, scenic, cultural, historical and natural resources, while encouraging appropriate economic activity.

A. ACCOMPLISHMENTS

Since 2010, the Warwick Open Space Committee has worked diligently and enthusiastically to accomplish many of the goals and objectives listed in the 2010 OSRP. The Open Space Committee is proud of their accomplishments and grateful to the many people who participated in the Committee's achievements. The Open Space Committee thought it helpful to note the accomplishments of the previous 7 years as a context for updating the OSRP and developing the new Seven Year Action Plan (2020-2027). The status of the Action Steps from the 2010 OSRP is described below.

2010 Ten Most Important Action Steps

1. Utilize teens and other volunteers to GPS and where appropriate make more accessible significant archaeological, geologic and historic sites – This step has been *partially completed*. The Warwick Historical Society published a book of historic houses in Warwick. The Open Space Committee has lead hikes to historic sites in town, including to the Metcalf Chapel original site, and the Indian caves.
2. Explore options for creating a meeting place for residents, especially teens and seniors – This step has been *partially completed*. The Town Hall is open once a week for seniors to convene for coffee and lunch.
3. Continue the inventory of ecological resources including certifying vernal pools – This step has been *partially completed*, and is ongoing. At least 30 vernal pools have been certified by the Warwick Conservation Commission since the last OSRP. The Commission holds an annual vernal pool day in the spring to help educate residents about vernal pools.

4. Develop a trail map of Warwick utilizing GPS and GIS with assistance from youths and other volunteers and establish a hiking club at the Community School – This step has *not been completed*.
5. Eliminate ATV damage to natural resources and trails – This step has *not been completed*.
6. Minimize the impact of invasive species – This step has been *partially completed*. The Conservation Commission is actively involved in invasive species control during site visits and through other field activities. More resident education is needed.
7. Minimize the impact of beavers – This step has *been completed* and is ongoing. The Conservation Commission provides assistance with beaver problems.
8. Mark the boundaries of town owned land – This step has been *partially completed*. Some volunteer survey work has been done on Town-owned land by a member of the Town Forest Committee, but more work is needed.
9. Permanently protect farmland, encourage big and small farming, and adopt a Right-to-Farm bylaw – This step has been *partially completed*. Warwick passed a Right to Farm bylaw in 2010. Mount Grace Land Conservation Trust (MGLCT) held a farm event at Town Hall and the Library, and completed a Warwick farm inventory in 2016. However, there have been no additional acres of agricultural land permanently protected in Warwick since the 2010 OSRP.
10. Construct dry hydrants and rehabilitate or build new fire ponds throughout town – This step has been *completed* and is ongoing. The Fire Department upgrades and improves fire ponds and dry hydrants on an ongoing basis.

Additional 2010 Action Step Status

11. Support the continued development of festivals and events to provide residents with opportunities to get to know their own community – This step has been *partially completed* and is ongoing. The Open Space Committee has held hikes as part of Warwick Old Home Days, and to celebrate the Shaw property acquisition.
12. Ensure that Town-owned open space is not used for institutional or commercial development, low income housing, or leased for private development or for private recreation – Discussion about Town-owned open space management is *ongoing*.
13. Develop a self-guided walking tour map that shows the cultural resources of the historic center of Warwick – This action step has *not been completed*.
14. Develop an Agricultural Commission – This action has been *completed*.
15. Prioritize town sponsored land protection projects and consider zoning changes that conserve open fields, farmland, forest land, streams, ponds, wetland, woods roads and trails, scenic vistas, and the town center – This action step is *ongoing*. The Town acquired the Victoria Shaw property in 2017, adding 88 acres to the Warwick Town Forest. The Open Space Committee continues to identify parcels of land for protection.

16. Accept land and easement donations and facilitate the activities of land trusts in the region – This action item is *ongoing*. The Open Space Committee works closely with Mount Grace Land Conservation Trust.
17. Take advantage of, or assign to a local land trust, the Town's right-of-first refusal with protection of high priority Chap. 61 lands – This action item has *not been completed*.
18. Develop a Land Protection Education program for townspeople to include estate planning, land protection options, and presentations by regional land trusts – This action item has *not been completed*.
19. Promote state and private investment in the protection of local and regional forested landscapes to conserve unique habitats of statewide importance, the value of which would be reduced significantly by development within the region – This action item is *ongoing*. The Open Space Committee works closely with Mount Grace Land Conservation Trust, MA DCR, and the North Quabbin Regional Landscape Partnership.
20. Inventory and work to develop the best methods for protecting special ecological, historical, and recreational resources in Warwick – This action item is *ongoing*. The Open Space Committee worked with MA DCR to protect a unique black gum swamp. The Conservation Commission continues to certify vernal pools.
21. Consider changes to Zoning bylaws and Board of Health regulations to better protect the public health by reducing the possibility of failed septic systems – This action item has *not been completed*.
22. Prepare a Cost of Community Services (COCS) study for the Town of Warwick – This action step has *not been completed*.
23. Protect wildlife corridor highway crossings – This action step is *ongoing*. Turtle crossing signs are reinstalled each year. Culvert assessment and upgrades are ongoing.
24. Assess the pros and cons of purchasing particular open space areas (e.g. beachfront property on Moores Pond and Hastings Pond), which could potentially provide public access to a valued recreational resource – This action step has been *completed*. Property on Moores Pond was purchased by the Town in 2010 to create a public beach and boat launch.
25. Consider the development of recreational resources for seniors as requested by them in a public comment session at the senior meal site in 2009 and in comments to the 2001 Open Space Survey – This action step has been *partially completed* and is *ongoing*. The Council on Aging and the Recreation Committee have added to the recreational activities offered since the last OSRP.
26. Encourage the Department of Conservation & Recreation (DCR) to develop recreational facilities on state forestlands to support public use of this resource for picnicking, hiking, swimming, equestrian use, and fishing – This action step has *not been completed*.
27. Develop recreational facilities and programming on town owned lands to support hiking, equestrian use, camping, and recreational sports, while recognizing the need to develop a regional recreational plan for services which Warwick cannot provide – This action step has been *partially completed*. The Recreation Committee is active in offering hikes and other recreational activities.

28. Plan a trail system and trail map for Warwick to link public holdings followed by a plan to acquire trail easements through gifts and by state and private grants – This action step has *not been completed*.
29. Encourage cottage industries and locally based economic activities with zoning and non-zoning techniques – This action step has *not been completed*.
30. Explore changes to zoning to protect homes and farms from adverse impacts on land use patterns by institutional or industrial development – This action step has been partially completed. Zoning is still needed for regulating large-scale solar installations.
31. Provide to townspeople through the newsletter and other methods, an educational program on the costs and benefits of housing, commercial, and industrial development – This action step has *not been completed*.
32. Consider acquiring more Town Forest land to provide income from timber harvests and carbon sequestration – This action step has been *completed* and is *ongoing*. The Town acquired the Victoria Shaw property in 2017, adding 88 acres to the Warwick Town Forest. The Open Space Committee continues to identify parcels of land for protection.

B. STATEMENT OF PURPOSE

The purpose of this plan is to provide an accurate and thorough basis for decision-making involving the current and future open space and recreation needs of the residents of Warwick in harmony with appropriate economic development. This plan brings together and builds upon the planning efforts and accomplishments of the past OSRP updates including the 1987, 2002, and 2010 Open Space and Recreation Plans, as well as the 2019 survey results. This OSRP represents more than a year of consensus building on the most important community and natural resource needs of the Town and the best solutions for addressing them. The Seven Year step-by-step Action plan, when carried out by the Warwick Open Space Committee and other town boards and commissions, will successfully implement the Town's open space and recreation goals and objectives.

C. PLANNING PROCESS AND PUBLIC PARTICIPATION

The process to update the 2010 Warwick Open Space and Recreation Plan officially began with the first public meeting on June 18, 2019. Over the next year and a half, the Committee met ten times to review sections of the plan, maps, and to develop a public survey with staff from the Franklin Regional Council of Governments. The agendas and minutes for each of these meetings are included as Appendix A. A survey was sent to all residents and the results were used to develop Sections 6 – 9 of this Plan. The survey and a summary of the survey results are included as Appendix B.

The Open Space and Recreation Plan Public Forum was held on January 28, 2020, and approximately 25 residents attended. Draft copies of the 2020 Warwick Open Space and Recreation Plan maps were on display during the Public Forum and attendees were encouraged to review the maps and write down any comments or suggestions for improving the maps and

numerous comments were made. Attendees were also given a copy of the draft Section 9 and the Seven Year Action Plan at the Public Forum, and were asked to identify their top five priority Objectives. A copy of the flyer advertising the Public Forum and the sign-in sheet and PowerPoint presentation given at the forum are included as Appendix C. Preceding and following the forum, copies of the draft maps and Seven Year Action Plan were made available for a public comment period at the Warwick Free Public Library. Comments expressed at the public forum were recorded and included in Section 10 – Public Comments. After review and discussion by the Open Space Plan Committee, all ideas, comments, and corrections received during the public forum and comment period pertaining to the different sections of the plan, maps and the action steps have also been included in the final version of the Warwick Open Space and Recreation Plan.

SECTION 3

COMMUNITY SETTING

Over the past several hundred years, human settlement and development has changed and shaped the landscape of the Town of Warwick. It is important that the Warwick Open Space and Recreation Plan include an analysis of growth and development and their effect on the landscape and natural systems upon which residents and the region's wildlife depend. Unplanned growth without consideration of its impact on the Town's rural character and natural resources will likely reduce the quality of life for future generations.

A. REGIONAL CONTEXT

The Town of Warwick is located in north central Massachusetts, in the eastern part of Franklin County. With 37.6 square miles, it is the fifth largest town in Franklin County. It is bordered by Royalston on the east, Orange on the south and southeast, Northfield and Erving on the west and southwest, and Winchester and Richmond, New Hampshire on the north. Bisecting the Town in a north-south direction, Route 78 is the principal highway serving Warwick. It provides access to State Route 2 via State Route 2A through West Orange. Route 2 is the major east-west transportation route across northern Massachusetts.

Warwick's geographic location has influenced its development and land use since its establishment in the 1760s. Its steep, forested hills and high-gradient fast running streams provided waterpower for all types of mills, but especially those that manufactured wood products. The town's extensive forest resources attracted entrepreneurs interested in establishing tanneries and saw, box, glass, and brick mills.

Low land prices attracted growing numbers of farmers to Warwick through the first half of the 19th Century. Clearing forests for conversion to agriculture and to generate much needed cash proceeded rapidly. In 1845 some million board feet of timber were sent to the mills from Warwick and by mid-century most of the land in town had been cleared for agriculture. Farms produced modest quantities of field-crops for local consumption with most land devoted to unimproved pasture for raising livestock. Cattle were favored over sheep (a reversal of the trend in many of the surrounding hill towns) and were sent to market for meat, milked for butter and cheese production and supplied hides to local tanneries. However, Warwick's distance from commercial centers in the Connecticut River Valley and limited agricultural potential hampered commercial ventures.

In the mid-1830s, the town's mountainous terrain proved too much for the railroad, which located on more level land along the narrow Millers River flood plain. Additionally, residents left Warwick for vast acres of prime farm land that opened in the mid-west and centralized manufacturing centers located along the region's large rivers near reliable transportation routes. This resulted in a swift decline in population that continued into the late 20th Century when the automobile enabled people to move to rural areas like Warwick and easily commute to work in the surrounding towns of Orange, Athol, and Greenfield.

Vast acres of abandoned farmland characterized the landscape in the late 19th and early 20th Centuries. Much of this land was purchased by the State at rock bottom prices. Now reforested, the Warwick State Forest is the core of the Commonwealth's many holdings in Warwick and surrounding towns, and is one of the Town's most important open space assets.

A.1. Natural Resources Context

Two regional landscape-level features are important to the development of Warwick and surrounding communities: abundant and contiguous forestland on steep, mountainous terrain, and a network of rushing rivers, streams and brooks that crisscross Northwest Massachusetts. Warwick is part of the Millers, Connecticut and Ashuelot River watersheds. The Millers and Ashuelot Rivers are major tributaries to the Connecticut River, New England's longest river and largest watershed. These rivers, mountains and forestland resources present opportunities and challenges to open space and recreation planning.

A.1.1. Large Blocks of Contiguous Forestland

Forests are one of the most important natural resources in Warwick. According to the Massachusetts Geographic Information System (MassGIS) 2005 land use data, approximately 89% (21,329 acres) of the 24,103 acres of land in Warwick is forested land. The forests encompass large tracts of uninhabited or road-less land of the type that provide the North Quabbin region its rugged and rural character. Blocks of contiguous forest in Warwick abut equally significant tracts of forest in the surrounding towns. The Commonwealth owns 49 percent of the forestland in Warwick, which is overseen by the Department of Conservation and Recreation (DCR) and includes Mount Grace and Warwick State Forests. The state land is made up of groups of protected parcels some of which are separated by privately owned woodlands.

Mount Grace State Forest is located to the north and west of Warwick Center along Route 78, just south of the New Hampshire border. The topography of this state forest includes 1,371 acres of steep terrain. The summit of Mount Grace rises 1,621 feet – the highest in Franklin County and the third highest peak in Massachusetts east of the Connecticut River. Mount Grace State Forest is best known for its trails used for hiking, cross-country skiing, horseback riding and snowmobiling. Several of these trails connect to the interstate New England National Scenic Trail.¹

¹ The section of the New England National Scenic Trail in Warwick is also known as the Metacomet-Monadnock Trail.

Warwick State Forest, with a number of parcels throughout Town, totals 10,383 acres. It includes Sheomet Pond, a thirty-three (33) acre impoundment, which is stocked in the spring and fall with trout by the Department of Fish and Game (DFG), and Richards Reservoir, a thirty-five (35) acre impoundment which is primarily used for fishing situated on Black Brook.

In 1995, DCR and the Mount Grace Conservation Land Trust (MGCLT) acquired 492 acres of open space to link a large tract of Warwick State Forest with MGCLT land, known as the Arthur Iversen Conservation Area. The MGCLT tract includes Gale Pond, portions of Hodge² and Rum Brooks and their associated wetland systems – a black spruce bog, several vernal pools and a cascade known as Devil's Washbowl. An additional 16 acres have been added since 1995. Land uses include trail activities, hunting, and forestry.

Over the years, the Town has acquired forested parcels that are collectively called the Warwick Town Forest. From an original purchase of 87 acres in 1925, the Town Forest has grown to encompass roughly 365 acres that includes a large black gum tree population. The Town Forest parcels abut State Forest lands, contributing to a large block of contiguous forest in the southwest section of town. In the past 20 years, private donations and fundraising by the Warwick Open Space Committee made several additions to the Town Forest possible. Most recently, in 2017 the Town received \$100,000 through the Environmental Bond Bill to secure approximately 88 additional acres.³

Large blocks of contiguous forestland are important regional resources for several reasons. They are areas with a low degree of fragmentation. They provide habitat for wildlife species that require a certain amount of deep forest cover and separation from humans. Some animals do well alongside humans and development (e.g. raccoons and squirrels); others require larger home ranges and unique habitat which Warwick's forest lands provide (e.g. fishers and bears).

Large blocks of forest protect and provide clean water, air, and healthy wildlife populations. Warwick is a town that was settled in part because of its forest resources. By having much of its forested landscape permanently protected from development, Warwick retains its rural heritage and helps the region by providing unique opportunities for recreational trail development, wildlife habitat, and protection of fresh ground and surface water resources.

Warwick's lands are part of a regional forested landscape that stretches from the Quabbin Reservoir, west to the Connecticut River and north to Cardigan Mountain into New Hampshire (Quabbin to Cardigan Region – Q2C). The North Quabbin Region in Massachusetts has statewide importance because a significant portion of the area is comprised of vast tracts of permanently protected forest that safeguard the water resources of Quabbin Reservoir, Greater

² Although listed as "Hodge Brook" on the USGS map, it is "Hedge Brook," named after Lemuel Hedge, an early minister in Warwick. See Charles A Morse, 1963 Warwick, MA, Biography of a Town. For planning purposes and consistency with state and federal publications, FRCOG will refer to it as Hodge Brook.

³ "Town of Warwick, MA Forestlands" booklet, compiled by George Day of the Warwick Open Space Committee, November 2017.

Boston's water supply, and the Millers and Ashuelot Rivers, major tributaries to the Connecticut River.⁴

Warwick lies within the Worcester Plateau Ecoregion which contains a number of large blocks of contiguous undeveloped forest that support biodiversity within the Commonwealth and have been identified as priorities for conservation.⁵ The Department of Fish and Game and the Department of Conservation and Recreation have invested monies for land protection in Warwick and the region as a whole. Also, land trusts like Mount Grace Land Conservation Trust (MGLCT), Franklin Land Trust (FLT), and New England Forestry Foundation (NEFF) and statewide conservation nonprofits like Massachusetts Audubon Society (MAS) and The Trustees of Reservations (TTOR) provide financial, administrative and technical support for land protection projects by working in partnership with the state to purchase the land in fee or as conservation restrictions.

A.1.2. Watersheds

Watersheds are areas of land that drain to a particular water body – a stream, river, pond or ocean. Large/major watersheds are made up of smaller tributary basins (sub-watersheds); their streams and brooks are more sensitive to land use, both the negative impacts of runoff and the positive effects of forest cover. Warwick's intact forest lands support the long-term integrity of wildlife habitats and protect the quality of surface and ground water in town and in the Millers and Ashuelot watersheds.

Warwick's lands drain into the Millers River to the south and east and the Ashuelot River to the north. In southwest Warwick, Darling Brook converges with Moss Brook, which flows through western Orange to the Millers River. Southeast of the center of Warwick, Rum, Black, and Hodge Brooks flow into each other to create Gales Brook, which enters Hubbard's Pond in Brush Valley. The outflow from Hubbards Pond that enters and exits Wheeler Reservoir is Orcutt Brook. Orcutt Brook flows into the Millers in West Orange less than a mile upstream from Moss Brook. In eastern Warwick, Tully Brook carries drainage from the Warwick State Forest to Sheomet Lake, the outflow of which is the West Branch of the Tully River. The West and East Branches of the Tully Brook join up on the Orange-Athol Town Line. Tully Brook is a tributary of the Millers River. Mill Brook flows along Northfield Road and becomes Pauchaug Brook (in Northfield), which flows directly into the Connecticut River.

Most of Warwick is located in the eastern portion of the Millers River Watershed, which includes portions of sixteen Massachusetts communities and four towns in New Hampshire. The Millers River Watershed is located in north central Massachusetts and southwestern New

⁴ According to the US Fish and Wildlife Service, the Connecticut River has 38 major tributaries and many more small tributaries.

⁵ *BioMap2: Conserving the Biodiversity of Massachusetts in a Changing World*. Warwick Town report, 2012. Massachusetts Division of Fisheries and Wildlife. <https://www.mass.gov/service-details/biomap2-conserving-the-biodiversity-of-massachusetts-in-a-changing-world>

Hampshire. It is bordered on the north by the Ashuelot River Watershed, on the south by the Chicopee River watershed, and on the east by the Nashua River watershed.⁶

From its tributaries of origin in New Hampshire, the Millers River flows south, then gradually west, ultimately flowing into the Connecticut River in Erving. The Connecticut River is the longest river and largest watershed in New England. It encompasses 11,260 square miles and has its headwaters at Fourth Connecticut Lake in New Hampshire at the Canadian border. From there the Connecticut flows 410 miles south forming the border between Vermont and New Hampshire and passing through central Massachusetts (Northfield to Springfield) and Connecticut to empty into Long Island Sound at Old Saybrook, Connecticut.

The Millers River drains a landscape that is 392 square miles in size, 320 of which are in Massachusetts.⁷ The total river length is fifty-one (51) miles, forty-four (44) of which are in Massachusetts. Although the Millers River fluctuates between sluggish and rapid flows, there is an average drop of twenty-two (22) feet per mile which has made it ideal for hydropower generation. This, in turn, made the Millers River and its tributaries a magnet for manufacturing and prompted its industrialization in the late 1700s.

Many town centers between Erving and Winchendon are located along the Millers River, or on one of its main tributaries. In the past, the presence of growing industries, residential development, and the use of the river and its tributaries for waste water disposal produced serious pollution problems. Many of the point sources of pollution have been regulated and as a result the Millers River is much cleaner today. However, the continued presence of dangerous levels of poly-chlorinated biphenyls (PCBs) found in fish tissue, fecal coliform, and phosphorus means that the river's ability to support recreation can be compromised. For example, fish flesh has been found to contain PCBs at levels that have caused the Massachusetts Department of Public Health to issue public health warnings against consuming fish caught in the Millers River. The full extent of the PCB contamination is under continued study by the State Department of Environmental Protection (DEP). The effects of PCB contamination in the Millers River will undoubtedly have a long-term impact on the recreational potential of the resource.

In northern Warwick, three brooks start in Warwick and drain into the Ashuelot River in southwest New Hampshire. Mountain and Kidder Brooks flow together to become Mirey Brook, which drains into the Ashuelot River. The Ashuelot, which is 64 miles long, begins in Washington, New Hampshire; it flows south and west to the town of Hinsdale where it enters the Connecticut River. Its watershed is 420 square miles and is home to the federally endangered dwarf wedge mussel. According to the U.S. Fish and Wildlife Service, the Ashuelot River is one of the four most important refuges for this mussel in the Connecticut River watershed. The Ashuelot River is currently included in Connecticut River anadromous fish⁸ restoration efforts for species including American shad and American eel. Lovers Retreat Brook flows into Bent Pond, whose outlet flows into Pauchaug Brook, which drains to the Connecticut River.

⁶ The Nashua River is not a tributary of the Connecticut River but is part of the Merrimack River watershed in eastern Massachusetts.

⁷ <https://www.mass.gov/service-details/millers-river-watershed>

⁸ Fish that live in saltwater but return to freshwater to spawn.

Water quality in the upper reaches of the Ashuelot River in New Hampshire supports wildlife as well as public recreation. However, sections of the lower reaches have experienced water quality issues relating to soil contamination, septic systems, and stormwater runoff. Efforts are underway to protect and improve water quality in the Ashuelot River watershed through public education, regulation, monitoring, land protection, and advances in municipal standards.⁹

The Connecticut River Watershed was designated the Silvio O. Conte National Fish and Wildlife Refuge by an act of Congress in 1991. It is the first national refuge of its kind encompassing an entire four-state watershed ecosystem including the Millers and Ashuelot watersheds. The Connecticut River also received special recognition in 1998 when it became one of only fourteen rivers in the U.S. designated as an American Heritage River. In May 2012, the U.S. Interior Secretary designated the Connecticut River as America's first National Blueway, saying the restoration and preservation efforts on the river were a model for other American rivers. The State has outlined watershed priorities for the Connecticut River which include: promoting and/or creating riparian buffer zones along the waterways within the watershed; reducing barriers to migratory fish passages; reducing the negative effects of non-point source pollution, primarily storm run-off; and increasing the amount of water quality data available within the watershed.¹⁰

As a result of the designations, communities within the Millers and Ashuelot watersheds can take advantage of assistance from the federal government and work with nonprofits such as the Connecticut River Conservancy, Millers River Education Center, Millers River Watershed Council, and The Nature Conservancy to help protect rivers and riparian habitat. Since protection of forests is inextricably linked to safeguarding water resources, the designations can also help preserve each watershed's forest land.

A.2. Socio-Economic Context

Warwick is a small rural bedroom community where over 90 percent of its working residents earn a living outside of Town. Of the few businesses left in Warwick, many are natural resource based – a woodworking shop, a campground, family farms, etc. A small percentage of residents say they derive income from open space – most from forest products or farms.

North Quabbin Woods, a program of the North Quabbin Community Coalition, and the North Quabbin Regional Landscape Partnership (NQRLP) are two nonprofit efforts that focus their programs on the multi-town region. North Quabbin Woods supports the use of the forest resources for forestry, wood products and recreation. The NQRLP is many organizations, communities, and businesses working together to identify, protect and enhance strategic ecological, cultural and historic open space within the rural region.

⁹ *Ashuelot River Corridor Management Plan*. Ashuelot River Local Advisory Committee. 2006.

<https://www.des.nh.gov/organization/divisions/water/wmb/rivers/documents/ash-plan.pdf>

¹⁰ <https://www.mass.gov/service-details/connecticut-river-watershed>

Recognizing the importance of the internet to Warwick's economy (cottage industry and small business), residents have created a municipal wireless network. They want better telephone and internet service, both of which will enable existing businesses to grow and new companies to spring up through marketing and sales via the technology. Much like the automobile and the interstate highway system, the internet gives people the option of living in rural areas, which in turn, could increase sprawl in rural areas by attracting more residential development.

Warwick's population has grown modestly within the past twenty years. Its remote rural character, good elementary school, and relatively inexpensive land prices have attracted new residents. With access to high-speed internet improving, the Town may see an increase in population in the coming years. At the same time, Warwick's population is one of the oldest in the region, with a median age of 54.9 years. By 2035, an estimated 41% of Warwick's population will be over the age of 65. This update to the Open Space and Recreation Plan outlines priorities for the Town to focus its natural, open space, and recreational resource efforts in light of past, current, and projected social, economic, and environmental trends.

A.3. Regional Open Space and Recreation Opportunities and Issues

Warwick is part of two regional greenways – the Quabbin to Cardigan (Q2C), which is in north central Massachusetts and southwest New Hampshire, and the North Quabbin Region, which overlaps with Q2C and is solely in the Commonwealth.

The North Quabbin Region is a circular belt of permanently protected open space that stretches northwest from the 60,000 acre Quabbin Reservation through New Salem, Wendell, and western Orange into Warwick. The eastern half of the circular belt continues up to the state line through Royalston, and then extends south to Tully Mountain in North Orange, Tully Lake, Birch Hill and Harvard Forest in Petersham. Another network connects the western part of the belt in Erving and western Orange through Wendell, Montague, and Sunderland to the Connecticut River.

Within these networks of open spaces there are eleven state forests or reservations that are popular for activities such as camping, fishing, hiking, and swimming. These include Warwick State Forest, Mount Grace State Forest, and the State Forests of Wendell, Orange, Erving, Montague, Shutesbury, and New Salem. According to the Mount Grace Land Conservation Trust, these lands together are the single largest continuous tract of protected land in southern New England.

Other protected open space and natural resources in the region that Warwick residents can use for recreation include the New England National Scenic Trail (NET), a 215 mile hiking trail stretching from the Long Island Sound in Connecticut to the Massachusetts and New Hampshire border, which passes through Warwick and Mount Grace State Forests. Laurel Lake in southwestern Warwick and eastern Erving, the Quabbin Reservoir, Lake Wyola, Lake Mattawa, Tully Lake, and the Northfield Mountain Recreation Area are other regional recreational attractions used by outdoor enthusiasts. The Franklin County Bikeway is a regional bicycle

network of shared roadway routes and off-road bicycle paths. The Northeast Franklin County Route travels through Warwick along Route 78 and Northfield Road. Installation of Bikeway and Share the Road signs along all routes is ongoing. Maps are available on the Franklin Regional Council of Governments website¹¹ and for free at local bike shops and sporting goods stores.

There are many critical natural and recreational resources that can only be conserved by permanently protecting networks of land that cross town and state boundaries. Warwick plays a prominent role in helping to expand its two greenways by protecting key parcels that add to these regional resources.

A.4. Regional Strategies for the Protection of Open Space, Natural and Recreational Resources

Protecting open space, wildlife habitat, and natural, scenic and recreational resources requires the ongoing actions at many different levels by many different organizations, agencies, communities and people – local, state and federal government; national, state and regional nonprofits; and interested citizens and landowners.

As such, regional efforts like the North Quabbin Regional Landscape Partnership (NQRLP) are key, because they represent local interests and attract financial and political support to the local agencies, nonprofits and towns doing the work. Agencies like FRCOG partner with nonprofits like MGLCT to plan for and acquire important lands with funding from state and federal agencies and foundations, and towns to implement local changes in land use patterns through zoning and open space protection that collectively save rural character and resources.

Warwick and other communities in the North Quabbin Region are fortunate because property values remain low, landowners are interested in preserving their lands, and the region is one of the last areas in the State with large contiguous forested blocks with significant biodiversity, making it easier for everyone to work together to preserve land and their communities.

According to the Mount Grace Land Conservation Trust, The Nature Conservancy considers the North Quabbin one of the two areas in the State most suitable for large-scale landscape protection. This gives the region national status and recognition. The Massachusetts Natural Heritage and Endangered Species Program and The Nature Conservancy have identified 8,625 acres of core habitat, and 18,791 acres of critical natural landscapes in Warwick that are critical to supporting biodiversity in Massachusetts.¹² MassAudubon's MAPPR (Mapping and Prioritizing Parcels for Resilience) online mapping tool is very helpful to communities wanting to prioritize lands for permanent protection from development based on habitat quality, climate

¹¹ <https://frcog.org/program-services/transportation-planning/>

¹² *BioMap2: Conserving the Biodiversity of Massachusetts in a Changing World*. Warwick Town report, 2012. Massachusetts Division of Fisheries and Wildlife. <https://www.mass.gov/service-details/biomap2-conserving-the-biodiversity-of-massachusetts-in-a-changing-world>. Core Habitat and Critical Natural Landscape acreage may overlap.

change resilience, and other criteria such as adjacency to existing protected parcels.¹³ (See *Section 4 Environmental Inventory and Analysis for more information*).

State and Federal funding programs are available to help conserve forests and farmland on a landscape scale. The Massachusetts Executive Office of Energy and Environmental Affairs (EOEEA) Landscape Partnership Program seeks to preserve large, un-fragmented, high-value conservation landscapes including working forests and farms. The program offers competitive grants to municipalities, non-profit organizations, and EOEEA agencies acting cooperatively to permanently protect a minimum of 500 acres of land. The USDA Forest Service's Forest Legacy Program provides funding to private property owners to place conservation restrictions on their land, in conjunction with a management plan. The program is only available to properties within designated areas of the state. Warwick and the North Quabbin Region are within the designated areas.

The Tully Valley Private Forest Lands Initiative is one example of a land protection effort in Warwick and the region. In December of 2000, the Mount Grace Land Conservation Trust coordinated a regional land protection project, which would build upon the existing circular belt of protected State land in the region. The Tully Valley Private Forest Lands Initiative was a pilot conservation project sponsored by the Massachusetts EOEA (now EOEEA). The purpose of the project was to protect a mosaic of forest and farmland under various ownerships thereby safeguarding important ecological processes and values, which occur at the landscape scale. The Department of Conservation and Recreation and the Department of Fish and Game purchased conservation restrictions from willing landowners, helping to keep the land in private ownership. Their focus areas for protection were near Tully Mountain in North Orange and surrounding areas including Warwick. Several other state agencies and land trusts were involved including the Department of Food and Agriculture (now Department of Agricultural Resources) and the New England Forestry Foundation (NEFF). All together the Initiative protected over 9,000 acres of land in the region.

Planning for the protection of critical natural resource systems requires both regional and local planning. Local planning and conservation boards and commissions are responsible for implementing zoning changes, land protection measures, and targeting/protecting land that will ensure the long-term preservation of the town's vulnerable natural, open space, and recreational resources. As neighboring towns work on similar projects, like Open Space and Recreation Plans, the protection of resources can extend out to a watershed scale and regional scale.

In 2013, Sustainable Franklin County: Franklin County's Regional Plan for Sustainable Development (RPSD) was completed. The RPSD is a long term guide for Franklin County municipal governments, regional organizations, businesses, non-profits, and individuals. Through extensive public participation, individual residents and representatives of many organizations contributed to the creation of the plan. The plan identifies issues and constraints, goals, and recommendations and strategies in seven subject areas: housing, transportation, economic development, energy, natural resources, cultural resources, and land use and

¹³ To access the tool, go to: <https://www.massaudubon.org/our-conservation-work/advocacy/shaping-the-future-of-your-community/current-projects/mappr-project/mappr-tool>

infrastructure. The overall sustainable development goals that came out of the public participation process are as follows:

- Increase and improve the housing stock, while focusing on affordability;
- Provide additional options for alternative transportation;
- Encourage economic development, by redeveloping vacant sites;
- Promote energy conservation and efficiency;
- Protect natural resources, including farmland and drinking supplies;
- Foster the growth of arts and culture;
- Concentrate new growth near town centers and focus on infill development; and
- Improve infrastructure, particularly broadband.

The plan notes that the predominant residential development patterns in the county are converting farms and forests to residential lots, and fragmenting the remaining farmland and forestland. The Approval Not Required (ANR) provision of the Subdivision Control Law allows for residential development along existing roads without Planning Board approval when frontage and access requirements are met. Combined with large lot zoning in many towns, which can require anywhere from one to four acres of land per home, the result is continual residential development spaced along town roadways, away from town centers. New subdivisions, while less common than ANR development, are also often located outside of existing town centers, further fragmenting the land and converting green spaces to development.

MassAudubon's most recent *Losing Ground* report found that as of 2013, over half of the land in the state (53%) remains undeveloped and unprotected. The report calls for an increase in land protection along with better land use planning on the local level with a focus on green infrastructure (preserving natural resources on a landscape scale that provide critical eco-system services like water filtration, carbon sequestration, and wildlife habitat), Low Impact Development (LID) (minimizing land clearing and mimicking natural systems to collect and treat stormwater at the neighborhood or site-specific scale), and smart growth principles that seek to reduce the impact of new development on the environment.¹⁴

In 2014, Harvard Forest published *Changes to the Land: Four Scenarios for the Future of the Massachusetts Landscape*,¹⁵ an evaluation of the consequences of four different trajectories for how land use could change in the state over the next 50 years, with a specific focus on the impacts to the region's forests. The scenarios reflect different amounts and intensities of land development, timber harvesting, farmland expansion, and forest conservation. Key findings from the study show that benefits to people and nature can be achieved by treating the forested landscape as valuable living infrastructure. Under a "Forest as Infrastructure" scenario, accelerated land conservation targeted to areas of priority habitat would protect more than half a million acres of priority habitat by 2060. Widespread adoption of improvement forestry would maintain critical forest benefits while increasing local wood production. The majority of new

¹⁴ To learn more about Smart Growth, see the Massachusetts Executive Office of Energy and Environmental Affairs' Smart Growth/Smart Energy Toolkit at http://www.mass.gov/envir/smart_growth_toolkit/.

¹⁵ <http://harvardforest.fas.harvard.edu/changes-to-the-land>.

development would be clustered and concentrated near existing cities and towns to minimize forest loss and reduce the impact of growth on water resources and forest habitat.

The study also found that the loss of forests to development has more immediate and pronounced impacts on carbon storage and water quality than gradual forest changes associated with climate change. The report emphasizes how local land-use decisions can greatly influence the ability of the state's forests to offset greenhouse gas emissions and moderate the effects of climate change. The overarching policy implications from the study are that there is much to gain by conserving forests and managing them well by:

- 1) Recommitting to land conservation,
- 2) Redoubling land-use policy and smart-growth efforts where new growth uses land efficiently and limits impacts on natural resources, and
- 3) Promoting sustainable forestry in the Commonwealth.

The loss of natural resources to new development can impact water quality through an increase in impervious surface, flooding, and erosion. Stormwater runoff from agricultural lands, roads, lawns, and other surfaces is now the most common source of water pollution in the U.S. The Millers River Watershed Council (MRWC), a nonprofit organization dedicated to the protection and clean-up of the Millers River, serves to facilitate communication among towns, organizations and agencies working to clean up the Millers and to coordinate water quality improvement efforts throughout the watershed. Most recently, the MRWC partnered with the Franklin Regional Council of Governments (FRCOG) on the Western Millers River Watershed Low Impact Development (LID) project. Funded through the EPA's Section 319 Nonpoint Source Pollution Grant Program, the two organizations worked with seven towns in the Franklin County portion of the watershed, including Warwick, to provide LID education and technical assistance to develop LID bylaws and ordinances. The goal of the project is to mitigate the impacts of stormwater runoff in urban areas, and to encourage development that incorporates LID to protect the sensitive areas in the more rural areas of the watershed like Warwick.

LID is a group of land use development techniques that capture water and rainfall on site, filter it through vegetation and let it soak into the ground before entering the water table. In rural areas, LID strategies use careful site design and decentralized stormwater management to reduce the environmental footprint of new growth. New homes are sited where they will create the least impact on natural hydrology and other ecological, scenic, or historic resources. Stormwater is managed in small decentralized structures such as grass swales and rain gardens that may be more consistent with the rural character than traditional "pipe and pond" systems. The width of roads and the amount of impervious surfaces are kept to a minimum to reduce stormwater runoff. Materials were developed as part of the Western Millers River LID project to help communities incorporate LID into local bylaws and stormwater mitigation and flood control activities, which were provided to Warwick and are available on the FRCOG website.¹⁶

For Warwick, partnerships, planning, water quality monitoring, GIS mapping, erosion control, local zoning, land protection, and growth management will all play a role in helping it to

¹⁶ <https://frcog.org/program-services/natural-resources-planning/green-infrastructure-and-low-impact-development/>

safeguard fresh water in town and across the region. Warwick can work with other towns, State agencies, local watershed organizations, and residents to protect its water resources. As with land protection, this regional approach, based in community and grassroots action, will safeguard the health of water resources, which in turn will protect public health and wildlife habitat.

B. HISTORY OF THE COMMUNITY

The Town of Warwick was originally given to veterans of the Canadian Expedition of 1690 as Roxbury and Gardner's Canada land grant in 1735. The original Warwick Township was six (6) square miles in size and laid out in sixty-three equal shares for the first settled minister, the ministry, school and sixty settlers. It was incorporated as the Town of Warwick in 1763 and although it is generally unknown, it is believed the name of Warwick was given to honor the Earl of Warwick, England, who played a prominent role in the colonization of New England.

The original acreage of Warwick was altered on two occasions. In 1740, the township lost 183 acres to the town of Richmond due to a dispute between New Hampshire and Massachusetts over its boundary. Another alteration to the Town took place in 1781 when the southeast corner of Warwick was given to the newly created District of Orange. This came about as the residents of south Warwick complained they had to travel a great distance to Warwick Center to attend church and engage in town affairs and preferred to create their own town with land from Warwick, Athol, Royalston and Ervingshire (now Erving).

B.1. Contact Period (1500 – 1620)

There are no native Contact Period sites documented in the Town of Warwick. The area's rugged terrain and absence of high quality agricultural land and large freshwater ponds or lakes suggest that period occupation was likely focused on areas of relatively level land, which are located in the general vicinity of Warwick village and south to Hastings pond, the hill overlooking Hastings Pond, the hill immediately southeast of Richard's Reservoir and the mixture of dry and marshy lowlands south of Moores Pond.

It is unlikely that native agriculture was undertaken in Warwick. Native fishing likely occurred throughout the Town's streams and natural ponds.

Warwick was probably utilized as a secondary resource area by the native occupants with the major population center situated in neighboring Northfield. The occupants were likely related to the Squakheags, the dominant group located in Northfield by the 17th Century.

B.2. Plantation Period (1620 – 1675)

Warwick probably continued to be utilized primarily as a secondary resource area for the native residents of Squakheag until late in the Colonial Period. Colonial interest in Warwick continued

to be discouraged due to its vulnerability to native attack and the lack of high quality land. Native subsistence patterns were probably much the same as those for the previous period although the development of the Anglo-Indian fur trade in the Middle Connecticut River Valley probably increased native hunting and trapping of fur-bearing animals in the area.

B.3. Colonial Period (1675 –1775)

Initial settlement in Warwick took place c.1739 with the construction of six homes; however, much of Warwick's early settlement did not occur until the early 1760s. Then, development took place in the vicinity of the present village center of Warwick. The Town's first meetinghouse, completed in 1760, was erected in the general area of the present Unitarian Church and the first minister, Reverend Lemuel Hedge, established his home that same year. Later settlement in this period took place north, northwest, and southeast of the early community. Warwick's first tavern was established by Deacon James Ball prior to 1775 probably at the junction of Old Winchester and Rum Brook Roads.

The colonial community earned its livelihood by livestock production and lumbering. The construction of the first local sawmill was completed in 1759 by Mattias Stone on Black Brook. This mill was followed by the first gristmill built in 1760 and also located on Black Brook. Close economic ties with Northfield were created due to Warwick's limited resources and lack of industrial base. As an example, prior to the construction of the gristmill on Black Brook, residents carried their grain to Northfield to be ground.

The first official census of the Town of Warwick was done in 1765 with 191 inhabitants recorded. The next census, taken eleven years later, found Warwick with 766 inhabitants. This far outstripped the neighboring Town of Northfield. It was theorized that many found well-established Northfield to be too expensive and instead chose to purchase inexpensive abundant land in Warwick where opportunities to establish industry and skilled professions and trades were in demand. Between 1764 and 1774 Warwick continued to grow as more and more roads were laid out and accepted by the town. In 1776, the Town could boast a tavern, stores, a blacksmith shop, gristmill, and sawmill.

B.3.1. Surviving Historical Resources

Less than one half dozen houses of the Colonial Period survive in Warwick and all date from the 1760s or early 1770s. Although not part of the Massachusetts Historical Commission's (MHC) database, the Stevens Place off Old Winchester Road was thought to be the oldest surviving house (c. 1760) until it was destroyed in a fire in 2012. Other houses that are on the MHC list are on Richmond, Athol and Winchester Roads. Of these the best preserved is the Morse House (1772) on Richmond Road. It is a two and a half story center chimney plan structure. Other houses include the Hedge House, a double interior chimney house dated circa 1760-1777 but with an appearance of c.1820. There is also a second double interior chimney house dated 1770 and a center chimney plan gambrel roofed cottage noted on Richmond Road.

B.4. Federal Period (1775-1830)

In 1781, the Town of Warwick voted to give 4,060 acres in the southeast corner of Town to assist with the creation of the District of Orange. The creation of this new town was initiated as the large number of residents of the village of South Warwick complained of the great distance to Warwick Center. The District of Orange also obtained land from Athol, Royalston and Ervingshire. By this action, the Town of Warwick lost many of its prominent citizens who became leaders in the new District.

Warwick Center remained as the local civic focus with development of the Upper and Lower Village along the axis of the current Route 78. Upland farming extended to the limits of potential cultivation, which was around the Town center with a secondary area at Four Corners.

The increasing population in the Town of Warwick brought a demand for more roads. These roads were often crude and impassable. To alleviate this situation and to assist the Town in connecting its roads to those leading to the eastern part of the state, corporations were authorized to build turnpikes, or toll roads, to be used by the public who paid a toll every ten miles. In 1799, the Fifth Massachusetts Turnpike was authorized leading from Northfield through Warwick to Leominster. Other turnpikes followed connecting Warwick to Athol, Orange, Brattleboro, VT and Winchester, NH. A number of these roads passed through upper Warwick Center. In 1805, William Dike set out from Warwick bound for Boston with a load of chestnuts. This was the first mention of an enterprise making use of the new turnpikes. At the same time, William Cobb and his wife ran a store, post office, and boarding house in the Center with Cobb making frequent trips to Boston to purchase merchandise for his store.

Like most other rural communities of this period, Warwick was forced to provide for itself most of the necessities of life. There were eight sawmills and three gristmills in Warwick by 1778. Other industrial development took place as well during this period. Two brickyards were known to have been operating in Warwick from 1790 to 1825, supplying the bricks used in construction of the homes in town. One industrious resident, Justus Russell took advantage of the abundant supply of domestic animals and built a tannery about 1800 on the Winchester turnpike, now Route 78. While many homes had looms to weave thread into cloth, there was an increasing demand for cloth on a larger scale. Opposite the Russell tannery, Jacob Rich erected a shop for the manufacture of cloth, which eventually specialized in the manufacture of black satin.

In 1812, Dr. Ebenezer Hall influenced Warwick's most prosperous men to organize the Franklin Glass Co., as glass was expensive and there was no nearby competition. The enterprise required the construction of several buildings, which were erected on both sides of Orange Road at Cemetery Hill. Tenements were also built to house the workers. In 1813, after hiring five glass blowers from New York, it was discovered that the clay found in Warwick was not suitable for the manufacture of the high temperature melting pots used in the kilns for making glass. Thus, clay was shipped from Philadelphia at great expense. Production and sales failed to meet expenses and the glass works closed in 1815, financially ruining many of Warwick's citizens.

Between 1820 and 1830, Warwick had as many as twelve sawmills, two mills manufacturing shingles and clapboards, four gristmills, two tanneries, two cabinet shops, three blacksmith shops, two shops manufacturing cutting tools, one potash plant, and two cloth-making shops. Also during this period, Warwick resident Captain Daniel Smith received a patent for his development of a machine called the revolving timber plane, believed to be what in modern times became known as the revolving plane.

Warwick's population peaked in 1820 at 1,256. Thereafter, the population began to decline. A rash of bankruptcies in 1824 and the opening of the West to emigration are supposed to be responsible for the start of this decline.

In 1827, the Fifth Massachusetts Turnpike relocated a new section of turnpike through Warwick. This section now passed through the village, but at some distance from the previous road. Mayo's tavern, and Cobb's store and post office, were no longer on the main thoroughfare in the center of the village. Due to this construction the Upper Village became of secondary importance with future expansion now expected to be toward the north. Land east and north of the Town Common thus became valuable and a new tavern, store and post office were built at more advantageous locations on the new road.

Despite the constant changes in routes, the tavern remained the center around which the Town revolved. Thus, the Warwick Inn, provided travelers with many years of service and hospitality. In 1828, a hall was built over the Inn's horse sheds. This hall served as the site of many of the town's community gatherings such as town meetings, religious services, dances and weddings for over a century. The Inn generally prospered until the end of the stagecoach routes, after which it became increasingly difficult to remain in operation. It changed ownership many times and even closed several times, however it was always rescued by some enterprising individual. The Inn is not in operation at this time.

B.4.1. Surviving Historical Resources

There are thirty houses of the Federal Period located in Warwick. These include nearly equal numbers of center chimney and double interior chimney houses. A similar number of cottages, nearly all with center chimney plans and five bay fronts also survive from the Federal Period. The finest concentration of period houses stands at the Town center but other houses stand at Four Corners and along Winchester, Athol, and Wendell Roads. Of note are a twin/rear wall chimney house at the Town center and a house with a double hip roof on Hastings Heights Road; the double hip roof is virtually unknown in the region. Other notable houses include the preserved Smith House (c.1800), the Stow House (1804), the Bass House (1812), and the Russell House (c.1800). The Russell House, which incorporates such Georgian features as an entrance surrounded with a deep segmental pediment and windows with crown moldings, could date earlier than the construction date given. Eight schoolhouses were indicated on an 1830 map and only one may have survived. There is a two-story, two bay-wide, side-hall plan structure located on Winchester Road south of the Center, which may be a schoolhouse of this period. Only one religious building was constructed during the Federal Period, a meetinghouse for the First Parish built in 1786-1788, however, this no longer stands.

B.5. Early Industrial Period (1830-1870)

In July of 1835, the railroad from Boston to Worcester opened. Consideration was given to constructing a rail line from Athol through Warwick to Winchester; however, the rugged hills of Warwick proved too great an obstacle. The rail line was therefore reconsidered and the change sent the line via Baldwinville to Athol, Orange, Northfield and Vernon, Vt. With the denial of this means of transportation, the decrease in Warwick's population accelerated. The railroad brought an end to the stagecoach lines running through Warwick from Brattleboro to Worcester. Towns located on the rail line began to prosper and businesses in Warwick could no longer compete. Many businesses began to fail or move to more prosperous towns.

Between 1865 and 1875 emigration West continued, as farmers no longer chose to work the difficult New England soil. There were several manufacturers who felt Warwick still had something to offer. In one instance, a chair making shop located on Wheeler's Pond was switched to brush manufacturing. It employed six to eight workers and produced 2,500 gross of brush woods. It continued in operation until 1872, thus giving the entire area the name, "Brush Valley." In 1872, it once again changed product lines, this time to the manufacture of wooden boxes and continued this business until 1920 when it was destroyed by fire. Nahun Jones of Boston moved his boot-making business to Warwick. He employed forty workers who manufactured 20,000 pairs of leather boots per year. In 1870, Mr. Jones donated land to the Town for the creation of a Town park, which later saw the addition of a bandstand. At this time sawmills also continued in operation, now shipping lumber to New England cities and New York. A tannery in operation employed eight and produced fifty tons of leather annually. The cottage industry of weaving palm hats between 1850 and 1900 replaced the weaving of cloth in Warwick. These hats were often bartered for dry goods and groceries at the stores that sold the hats.

The population of Warwick in 1830 was 1,150 and dropped to 769 by 1870.

B.5.1. Surviving Historical Resources

Cottages became the predominant house type of the Early Industrial Period. While a number of side-hall plan cottages in the Greek Revival and Italianate styles were built, by far the most common plan for cottages was the traditional center entrance, five-bay plan with either a single chimney or double interior chimneys.

Two important religious buildings were built in Warwick Center during this period. These were the Baptist Church (1844), which has been the Warwick Library since 1919, and the present Unitarian Church (1836). The Baptist Church, a one and one half story gable front Greek Revival building, is the more modest. The Unitarian Church, two stories tall with a projecting porch with pediment and double entrances, incorporates Greek Revival and Gothic Revival details including lancet windows and a two-stage square belfry with pinnacles and a spire.

B.6. Late Industrial Period (1870 – 1915)

During the Late Industrial Period, Warwick Center remained as the focus of the local highway system with the primary axis north-south from Orange and east-west from Northfield. No rail or trolley lines were constructed or planned. As a result, Warwick's population continued to decline.

The agricultural economy of Warwick remained dominated by the lumbering and woodworking industries, though both declined as the period progressed. Dairy farming continued on the highlands near the Town center. The boot production of Nahun Jones' company accounted for 57 percent of the Town's total product value while lumbering accounted for another 36 percent. In the 1890s, many families moved into Warwick to work in area sawmills, when there was a surge in timber cutting. The population of Warwick in 1890 was 565 but by 1900 it had grown to 619. When the timber was exhausted, however, these families left town.

Given the timber cutting of the 1890s and the subsequent reforestation of the forests and abandoned farms, Warwick's residents began to become increasingly concerned about conservation. One citizen, Dr. Paul Goldsbury, was instrumental in placing a bill before the Massachusetts Legislature in 1915 to establish a state park at Mount Grace. The bill was passed and by 1927 the state had acquired most of Mount Grace for a total of 3,000 acres, with smaller parcels purchased over the years as they became available. By 1962, over 8,361 acres had been acquired. At the start of this period, Warwick had a population of 769, but by 1910, the population dropped sharply to 477.

B.6.1. Surviving Historical Resources

Very limited residential construction took place during this period. The only exception occurred after 1900 when some resort development took place around Laurel Lake and Moores Pond. Small cottages, most one story, gable roofed structures with clapboard, shingles, or novelty siding, were built. Another form of resort development was the conversion of Colonial and Federal Houses to summer use and the construction of additions to existing houses for use as summer hotels.

Two important institutional buildings were constructed at Warwick Center during this period. These are the Town Hall constructed in 1894 and the Center School built c. 1910. The Town Hall is a two and a half story hip roofed Colonial Revival structure and the School is one story with a hip roof.

B.7. Early Modern Period (1915 – 1940)

During the Early Modern Period, the main improvement of the north-south transportation axis from Orange to Keene, New Hampshire was secondary highway Route 78. Route 78 passed through Warwick Center to the Mount Grace Ski Area.

No new industries were identified during this period and agriculture remained the dominant source of income. The last remaining industry, the box shop owned by George Wheeler, closed in 1918 when Mr. Wheeler retired.

The Depression of the 1930s had little immediate effect on the Town as most residents earned their livelihood within Warwick. With the coming of the Roosevelt administration, the agencies created to relieve unemployment extended to Warwick. The Work Progress Administration (WPA) provided work for the unemployed three days per week. Projects in Warwick consisted of roadwork and brush cutting along roadsides. The WPA provided work until about 1941.

A transient work camp, built in 1934, was also located in Warwick by the Federal Emergency Relief Administration. This was set up to provide work and shelter for the ever-growing numbers of homeless men. The camp, which operated for three years, accommodated 200 and was located near Richards Reservoir. In 1962, this site became home to a prison camp operated by the Massachusetts State Department of Corrections. Prisoners worked under the direction of foresters and the Department of Natural Resources to assist with reforestation and conservation efforts.

In 1935, two Civilian Conservation Corps Camps were located in Warwick. These camps were designed to employ young men who were unable to find work after completion of their education. Water holes and roads were built in an effort to protect forests from destruction by fire. Picnic areas were also constructed. By 1938, the CCC Camps were closed. The Hurricane of 1938 created the need for timber salvage operations in Warwick due to the extreme number of fallen trees in the area. As a result, five sawmills were set up in Warwick to deal with the fallen timber.

B.7.1. Surviving Historical Resources

In 1925, the Town of Warwick voted to purchase 100 acres of land at the junction of Wendell and Hockanum Roads. This purchase resulted in the creation of the Warwick Town Forest.

Table 3-1: Significant Historical Structures and Sites in Warwick

MHC #	STREET NAME	HISTORIC NAME	COMMON NAME	YEAR
4	4 Hotel Rd	Warwick Inn – Sheomet House – Putnam’s Hotel	Mount Grace Inn	1828
5	Athol Rd	Cobb, William House and Post Office	Atherton, Capt. Arlin S. House	1828
9	Athol Rd	Hedge, Rev. Lemuel – Reed, Rev. Samuel House	Green, Leslie W. – Francis, Howard House	1768
10	Athol Rd	Goldsbury, Capt. James House		1826
11	Athol Rd	Smith, Rev. Preserved House	Metcalf Memorial Chapel	1827
13	Athol Rd	Wheelock, Col. Lemuel – Lincoln, Frederick A. Hse		1820
14	Athol Rd	Wheelock, Col. Lemuel Double House	Cook, Rhoda House	1836
23	Athol Rd	Mayo, Caleb and Edward House	Morse, Arthur – Bailey House	
29	Athol Rd	Wheelock, Col. Lemuel – Wright House	Morse, Gillman – Cook, George S. House	1835
30	Athol Rd	Warwick Town Hall		1894
15	Flower Hill Rd	Whitney, Daniel – Child, Phineas House	Barber, Dea. Harvey House	
16	Flower Hill Rd	Hanson, C. – Maynard, Nelson House	New England Box Company –	

MHC #	STREET NAME	HISTORIC NAME	COMMON NAME	YEAR
			Shepardson, Detroit Hse	
17	Flower Hill Rd	Simonds, William – Daniels, Moses House	Hardin, Moses – Goddard, David House	
18	Flower Hill Rd	Bowman, Samuel – Gale, Jacob R. House	Ellis, Ezekiel House	1773
3	Gale Rd	Rich, Lt. Thomas – Conant, Josiah House	Gale, Appleton – Green, Frank House	1770
24	Gale Rd	Stow, Amos and Thomas House	Johnson, Daniel House	1804
902	Hastings Pond Rd	Wabeek – Wawbeek Rock		
904	Laurel Lake Rd	Erving State Forest – Laurel Lake		
905	Laurel Lake Rd	Erving State Forest – Laurel Lake Dam and Bridge		1933
906	Laurel Lake Rd	Erving State Forest – Laurel Lake Beach Stonework		1933
21	Old Winchester Rd	Shearman, Abner – Bancroft, Ebenezer House	Kidder, Aaron – Hatch, Irving H. House	1775
22	Old Winchester Rd	Lawrence, William Jr. – Forbes, Sabin House	Ladd, E. – Brown, R. House	1860
6	Orange Rd	Sanger, Joshua T. House	Hatch, Rev. Roger – Conant, James A. House	1827
8	Orange Rd	Franklin Glass Company Showroom and Storehouse	Smith, Capt. Daniel N. – Wheelock House	1813
12	Orange Rd	Franklin Glass Company Superintendent House	Synes, James – Taylor, Dr. Amos House	1812
25	Orange Rd	Wheaton, Reuben – Wheeler, James House	Jennings, N. House	
27	Orange Rd	Atwood, H. House		
28	Orange Rd	Williams, Charles House	Tyler, Mary A. House	1895
31	Orange Rd			
32	Orange Rd	Warwick General Store and Post Office		1894
33	Orange Rd			
34	Orange Rd	Trinitarian Congregational Church Parsonage	Moore, Dea. George – Dresser, Lee J. House	1856
35	Orange Rd	Warwick Unitarian Church		1836
801	Orange Rd	Warwick Center Cemetery		
903	Orange Rd	Brush Valley Bridge	Orange Road Bridge over Orcutt Brook	1920
1	Richmond Rd	Stearns, Capt. Nathaniel House		1772
907	Rte. 78	Mount Grace State Forest – Council Ring		1936
908	Rte. 78	Mount Grace State Forest – Adirondack Shelter		1936
909	Rte. 78	Mount Grace State Forest – Gulf Brook Stonework		1933
910	Rte. 78	Mount Grace State Forest – Gulf Brook Dam		1933
911	Rte. 78	Mount Grace State Forest – Gulf Brook Fireplaces		1933
2	Warwick Rd	Fifth Massachusetts Turnpike Tollhouse	Sawyer, Eliakin – Williams, Melzer House	
26	Warwick Rd	Williams, Melzar – Nelson House	Hastings – Bass, Dwight House	
900	Wendell Rd	Wendell Road Bridge over Moss Brook		1925
7	Winchester Rd	Morse, Nathan – Procter, Laban House	Cobb, William – Fisher, Rueban House	1809
19	Winchester Rd	Bancroft, Ebenezer House – Warwick Poor Farm	Anderson, Augustus G. House	1785
20	Winchester Rd	Russell, Justus House	Bicknell, Margaret House	1800
36	Winchester Rd	Warwick Baptist Church – Warwick Public Library		1844
901	Winchester Rd	Warwick Grist Stones		
A		Warwick Center		
B		Erving State Forest – Laurel Lake Area		
C		Mount Grace State Forest – Ohlson Field Area		
D		Mount Grace State Forest – Gulf Brook Picnic Area		

Source: Massachusetts Historical Commission; 2002.

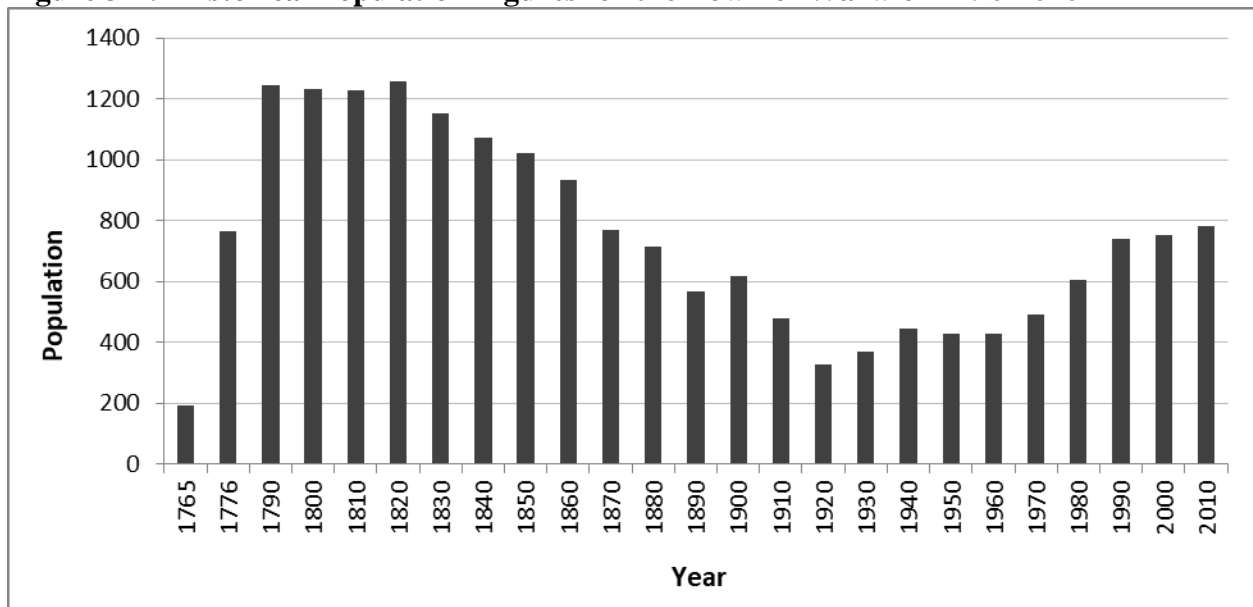
C. POPULATION CHARACTERISTICS

In this section, Population Characteristics, Warwick's needs for open space and recreational resources are assessed based on an analysis of demographic and employment statistics. The demographic information includes changes in total population, the different age groups in Warwick, and development patterns. In small towns like Warwick, traditional sources of employment figures rarely provide an accurate description of the economic base and labor force. However, federal and state statistics have been combined with informal surveys of local officials and anecdotal information to provide a more accurate representation of the local economy.

C.1. Demographic Information

In 1765, the first official census of the Town of Warwick recorded 191 inhabitants. Subsequently, Warwick's population began to increase dramatically. Land was inexpensive and residents of surrounding towns wanting to purchase a homestead, open a business, or ply their trade in a new location turned to Warwick. By 1776, when the next census was taken, Warwick boasted 766 inhabitants. Then new roads were built and Warwick's population rose further as outlying areas in town became accessible. In 1820, the population of the Town of Warwick peaked at 1,256 but thereafter began a slow decline. One hundred years later in 1920, the population had plummeted to 327.

Figure 3-1: Historical Population Figures for the Town of Warwick 1790-2010



Source: US Census and Massachusetts Census, various years.

Emigration west, bad business decisions causing bankruptcy, and the lack of modern modes of transportation such as a rail line were all factors contributing to this decline. Between 1930 and 1970, Warwick's population averaged 432 residents, for a 32 percent increase over the low point

of 1920. The population of Warwick continued to rise during the decades 1970-1980, which saw a 23 percent increase, 1980-1990, which saw a 6 percent increase, and the decade 1990-2000, which saw a slight increase of 1.4 percent for Warwick while Franklin County's growth was only 2.1 percent. From 2000-2010 Warwick's population saw a 4 percent increase, from 750 to 780, a rate of increase comparable to nearby Northfield and Orange. More recently, based on the 2012-2016 American Community Survey estimate, population in Warwick has decreased slightly at a rate of -4.9%, bringing the population to 742, below the population in 2000. During the same period, there was also population loss in Northfield, Orange, and Franklin County as a whole.

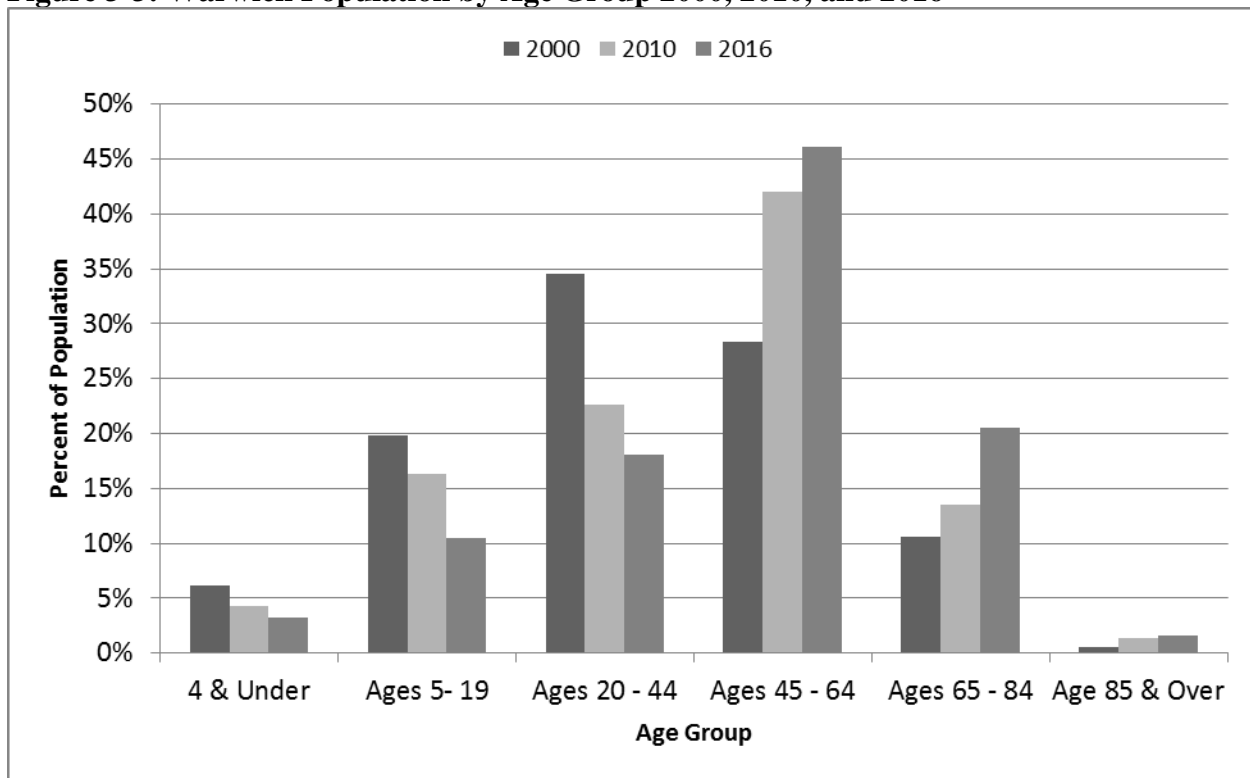
Table 3-2: Comparison of Population Growth Rates for Warwick, Franklin County and Massachusetts 2000-2016

Location	2000 Census	2010 Census	% Change 2000-2010	2016 Estimate	% Change 2010-2016
Warwick	750	780	4.0%	742	-4.9%
Northfield	2,951	3,032	2.7%	3,006	-0.9%
Erving	1,467	1,800	22.7%	1,871	3.9%
Orange	7,518	7,839	4.3%	7,709	-1.7%
Royalston (Worcester County)	1,254	1,258	0.3%	1,356	7.8%
Franklin County	71,535	71,372	-0.2%	70,916	-0.6%
Massachusetts	6,349,097	6,547,629	3.1%	6,742,143	3.0%

Source: U.S. Census 2000 and 2010 Population Data; American Community Survey 2012-2016.

According to the American Community Survey 2012-2016, the Town of Warwick has an older population with the median age of residents being 54.9 years. When comparing age groups, or cohorts, between 2000 and 2016 (See Figure 3-3), the largest population increase occurred for residents in the 45-64 age group and the largest decrease occurred for residents in the 20-44 age group. The increase was driven by the aging of the baby boomer generation (born 1946-1964), whose members ranged in age from 52-70 in 2016. From 2000 to 2016, the number of people who were between the ages of 45 and 64 years jumped from 28 percent of the population in 2000 to nearly half of the population in 2016. This occurred while Warwick's population aged 20 to 44, decreased from 35 percent in 2000 to 18 percent in 2016, with decreases also seen in the percent of the population under 19.

Figure 3-3: Warwick Population by Age Group 2000, 2010, and 2016



Source: U.S. Census 2000 and 2010 Population Data; American Community Survey 2012-2016.

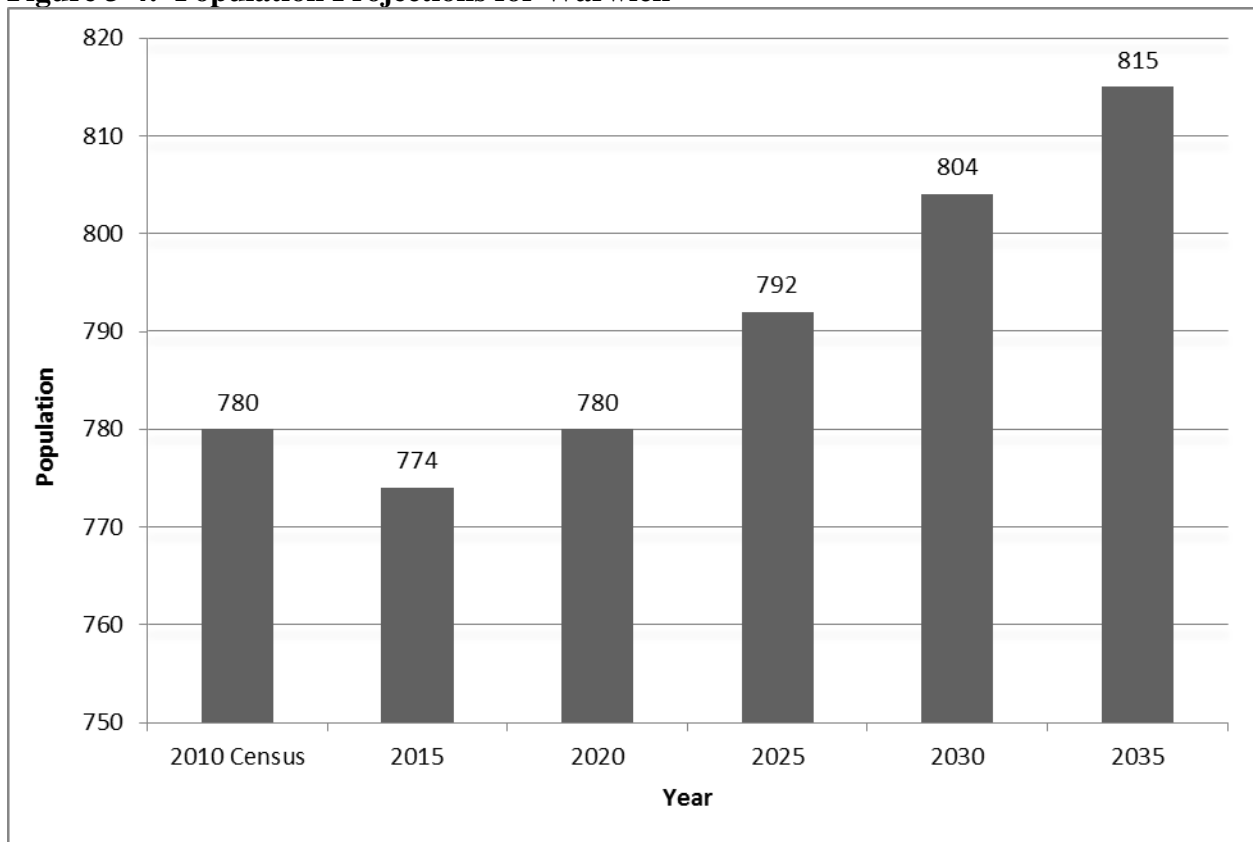
Table 3-3: Percent of Population by Age Group in Warwick, Franklin County, and Massachusetts, 2016

	4 & Under	Ages 5- 19	Ages 20 - 44	Ages 45 - 64	Ages 65 - 84	Age 85 & Over
Warwick	3%	11%	18%	46%	20%	2%
Franklin County	5%	16%	29%	32%	16%	2%
Massachusetts	5%	18%	33%	28%	13%	2%

Source: U.S. Census, 2000 and 2010; American Community Survey 2012-2016 (2016 data).

In comparing the Town of Warwick's age distribution characteristics to that of Franklin County and the State, it was found that Warwick has a significantly older population, with a median age of 54.9, the highest in the County, according to the American Community Survey 2012-2016. Franklin County's median age is less than Warwick's at 45.4 years, while that of Massachusetts's residents is 39.4 years. Nearly half of Warwick residents are in the age 45-64 age group, while this number is 32 percent for Franklin County and 28 percent for the State. Likewise, the young adult and middle aged population, ages 20-44, makes up a smaller percentage of the population in Warwick, only 18%, than in the County (29%) and the State (33%).

Figure 3-4: Population Projections for Warwick



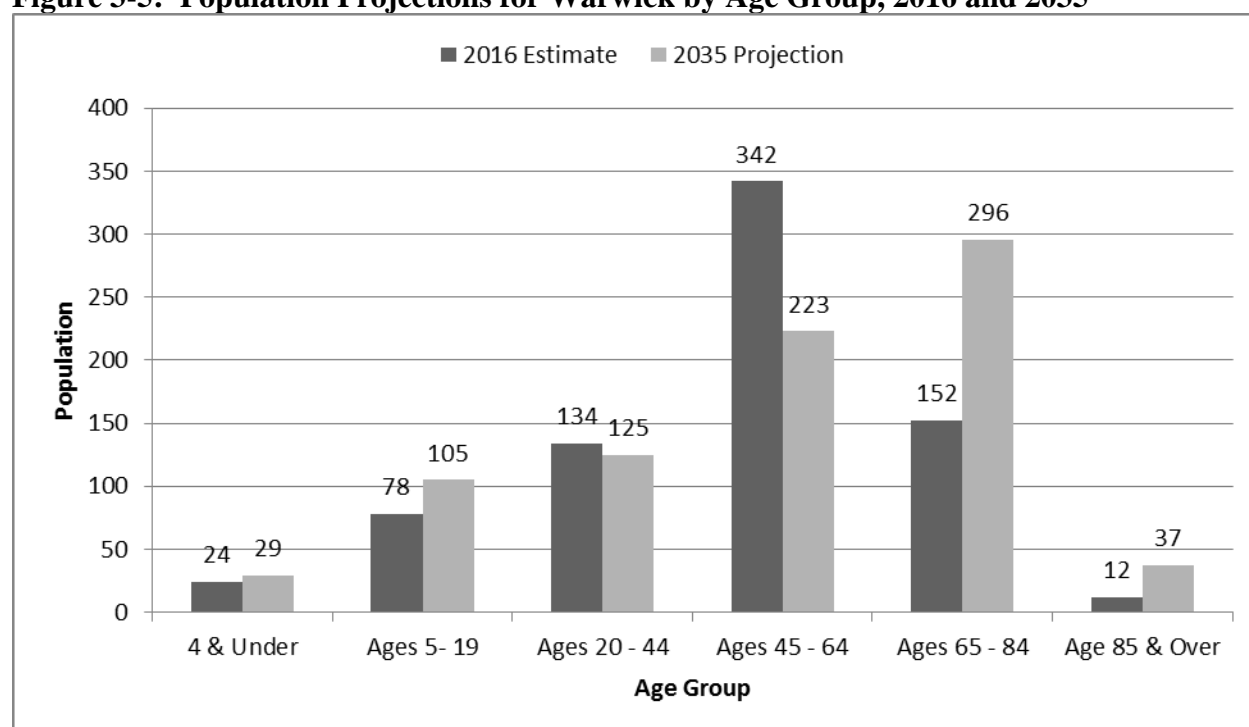
Source: 2010 U.S. Census; UMass Donahue Institute Population Projections. 2015.

In 2015, the UMass Donahue Institute published population projections for all Massachusetts cities and towns, projected from 2010 to 2035 at five year increments. Figure 3-4 shows the projections for Warwick's population. Warwick's population is projected to increase from 2020 to 2035 by 35 people over that time span. The 2016 population estimate from the American Community Survey indicates a population of 742, a greater decrease than the 2015 projections.

While the overall population numbers are not expected to change dramatically, the age make-up of the population is projected to shift significantly in the next two decades. Figure 3-5 shows the projected population by age group for 2035, compared to the 2016 estimate. By 2035, it is projected that the senior population, age 65 and over, will double, representing 41 percent of the population, compared to 22 percent in 2016.

Based on population projections for the next two decades, the Town of Warwick will need to provide for an aging population in its open space and recreation programming. Seniors require different recreational facilities and services, including accessible walking paths, arts, and leisure programs. At the same time, youth and other age groups will continue to need facilities and programs that can provide safe spaces for recreation as well as access to open space.

Figure 3-5: Population Projections for Warwick by Age Group, 2016 and 2035



Source: American Community Survey 2012-2016; UMass Donahue Institute Population Projections. 2015.

Based on this analysis, Warwick has had limited growth, which is similar to that of the County and, to some degree, the State. Warwick may need to plan for youth and middle-aged adults in its open space and recreation programming, even if some of these resources are provided outside of Town and especially in regards to sports fields for youth. Although seniors in Town might benefit from well-maintained walking paths as compared to hiking trails, survey results show that much of the treasured recreational activities (walking, gardening, hiking and birdwatching) are already available on the many parcels of open space. Gardening as a recreational activity probably refers to the work residents do on their own grounds or at the school.

In identifying the best location for new recreation fields, trails and facilities, the town should consider where population growth is likely to occur. Future growth (density and location) will depend in large part on soil and groundwater constraints, town zoning, and which lands are permanently protected from development. It is best to have parks and walking/hiking trails that are close to concentrations of development and areas that would be developed for residential use. Officials could be looking for opportunities to conserve land in Warwick that protects valuable scenic and natural resources and provides public access to trail networks and open spaces.

To assess the ability of Warwick residents to pay for additional recreation resources and access to open space, its income level is compared to that of Franklin County and the State. The income figures for Table 3-5 are from the 2016 American Community Survey.

Table 3-5: 2016 Median Household Income Statistics

Location	Per Capita Income	Median Household Income	% Below Poverty Level
Warwick	\$31,588	\$56,838	8.9%
Franklin County	\$31,689	\$56,347	11.3%
Massachusetts	\$38,069	\$70,954	11.4%
United States	\$29,829	\$55,322	15.1%

Source: American Community Survey 2012-2016

In 2016, Warwick’s median household income was \$56,838. Based on these figures, Warwick’s households earn slightly more than the County median but less than those of the State. Whatever the generational make up of the future community, recreation and open space needs may change over time. Given the modest wealth of its residents, the Town will need to create these services and facilities in an inexpensive manner for its residents.

C.2. Population Density¹⁷

Warwick has a total area of 24,103 acres and a population of 742 people, which gives a population density of one person per 32 acres. The town has one zoning district which is agricultural/residential. The town is characterized by dweller-owned, single family homes. There are no high concentrations of housing units such as an apartment complex or subdivision. Warwick is a low-moderate income community and the home prices show this. Most houses are valued in the \$100,000 to \$400,000 range, according to the American Community Survey 2016 estimates, with a 2016 median sales price of \$232,000, according to the Warwick Board of Assessors. The more valuable homes tend to be the old colonial homes which are scattered around town. While the most valuable land is around the lakes, most of these houses are converted camps on very small, pre-existing, non-conforming lots. The village center has a larger concentration of homes and many of them are colonial houses. The town has no commercial or industrial base, and is over 90% forested. There are very few minority residents. This results in a remarkably uniform population spread over the town with income about evenly divided among the several sections and no areas of environmental justice concern.

Within this context some additional elucidation might be helpful. An area of concern is that many of the colonial homes are inhabited by elderly people often living alone. The days of multi-generational families living in these homes seems to be gone, so zoning amendments have been passed to make it easier to establish apartments within these structures. The hope is that these apartments could provide some cash flow or could provide housing for a care giver. A related concern is the steady decline of household size, which results in many houses with only one inhabitant, and the steady increase in home ownership costs which are proving to be a particular burden to those on fixed incomes.

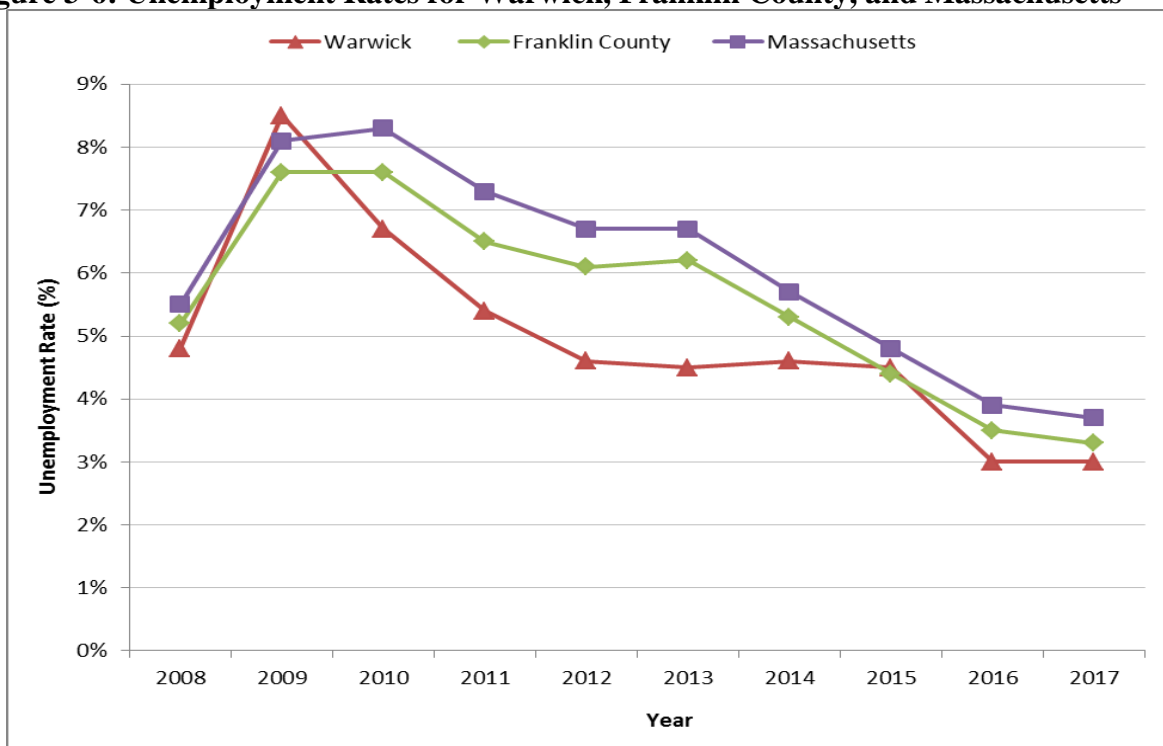
¹⁷ In Warwick, when population density is mentioned, most people think of turkeys, or deer or how things are going with their bird feeder. Please see the discussion at the end of this section for the population densities that we care about.

Much of the town is permanently protected. State forest lands are 49% of the land area, and when other permanently protected land is added the total is about 58%. This means that the population density on land currently available for housing (roughly 10,153 acres, or 42% of land in town) is about 13.7 acres per person. It should be recognized that many homes have owner-owned Chapter 61, 61A, or 61B land surrounding the house lot, which is considered temporarily protected from development. It should also be noted that all recent housing development in Warwick has been through the Approval Not Required provision under the Town's Subdivision Control regulations, which allows for new house lots to be created along existing roads. Pressure to create new roads for house lots (i.e. a new subdivision) has not materialized to date in Warwick.

C.3. Employers and Employment Statistics

In 2017, The Town of Warwick had a labor force of 501, which has remained consistent since 2010, according to the MA Department of Workforce Development, Labor Force and Unemployment Data. The labor force is defined as the number of Warwick residents who are employed or who are seeking employment. Warwick's unemployment rate compared to the County and the State is shown in Figure 3-6. The Town experienced the same fluctuations in unemployment as the County and State over the last 10 years. However, Warwick's unemployment rates have been consistently lower than the County and State. In 2017, the unemployment rate for Warwick residents was 3.0% while it was 3.3% for the County and 3.7% for the State.

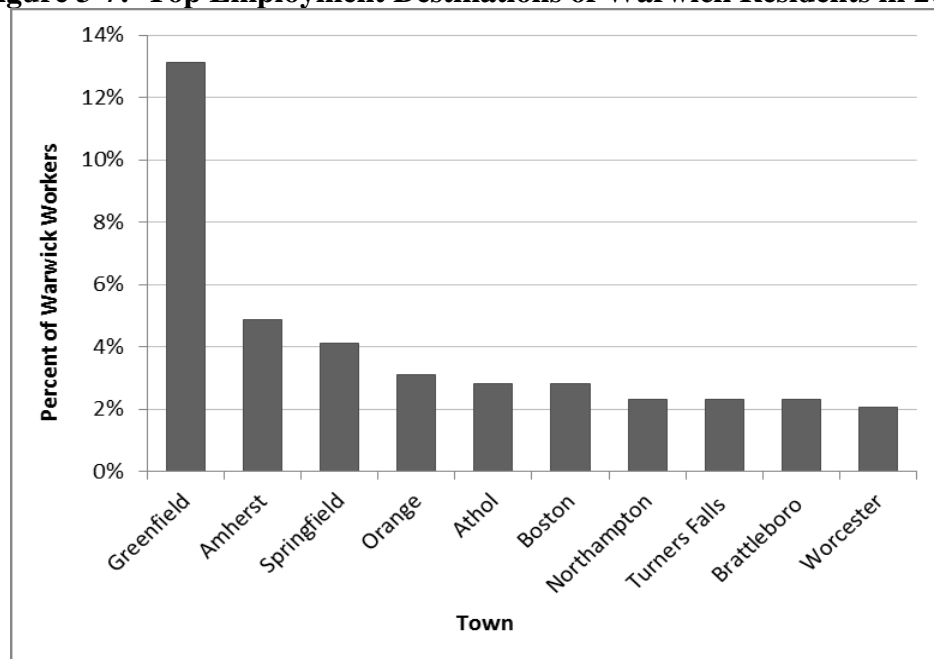
Figure 3-6: Unemployment Rates for Warwick, Franklin County, and Massachusetts



Source: Massachusetts Executive Office of Labor & Workforce Development, Labor Force & Unemployment Data.

Figure 3-7 indicates the top destinations for Warwick's labor force in 2015 according to the U.S. Census Bureau Longitudinal Employer-Household Dynamics (LEHD). The top five destinations of Warwick's labor force include Greenfield, Amherst, Springfield, Orange, and Athol. Overall, 98.7 percent of Warwick's labor force was employed outside of Town. The mean travel time to work for Warwick residents was 37 minutes according to the American Community Survey 2012-2016. Meanwhile, 33 residents worked at home. The top industries in which Warwick residents work are listed in Table 3-6, with healthcare and education comprising over 30% of employment. Warwick's labor force is aging, with 28% of employees aged 55 or older.

Figure 3-7: Top Employment Destinations of Warwick Residents in 2015



Source: U.S. Census Bureau Longitudinal Employer-Household Dynamics (LEHD), 2015

Table 3-6: Top Industries for Warwick Residents

Industry	Total Workers	Percentage of Total
Health Care and Social Assistance / Educational Services	129	33%
Manufacturing	47	12%
Construction	33	8%
Professional, Management, Administrative	28	7%
Public Administration	27	7%
Other Services (excluding Public Administration)	24	6%
Retail Trade	24	6%
Arts, Entertainment, Accommodations, Food Service	23	6%
Agriculture, Forestry, Fishing & Hunting, Mining	21	5%
Transportation, Warehousing, Utilities	21	5%

Industry	Total Workers	Percentage of Total
Finance, Insurance, Real Estate	8	2%
Information	7	2%
Total	392 ¹⁸	100.0%

Source: U.S. Census Bureau American Community Survey Five-Year Estimates, 2014-2018

Table 3-7 shows the number of business establishments and average monthly employees working for employers located in Warwick from 2007 to 2016. The Town of Warwick had eight establishments in 2007 with an average of 79 people employed in town monthly. Since 2007, the number of establishments has increased to 13 but the average monthly employment has decreased to 51. Weekly wages for workers at Warwick establishments have fluctuated between a 2014 low of \$428 and a 2009 high of \$580. The average weekly wage in 2016 for Warwick establishments was \$446, while the average weekly wages for Franklin County were \$781 and \$1,297 for the State.

Table 3-7: Total Establishments and Employment in Warwick, 2007-2016

Year	Number of Business Establishments	Average Monthly Employment	Average Weekly Wages
2007	8	79	\$490
2008	8	78	\$539
2009	8	64	\$580
2010	12	55	\$467
2011	11	38	\$521
2012	10	43	\$485
2013	11	49	\$480
2014	11	56	\$428
2015	11	51	\$443
2016	13	51	\$446

Source: Massachusetts Executive Office of Labor and Workforce Development, Employment and Wages Data (ES-202).

Interviews with Town officials found that there are few businesses in Warwick. The Wagon Wheel Campground located in the southern section of Warwick, encompasses seventy-eight (78) acres of woodland with 102 campsites. It operates on a seasonal basis, but has no payroll. Chase Hill Farm is an organic dairy farm located in the eastern section of Warwick. Chase Hill Farm produces raw milk, artisan cheese, and grass-fed beef. Hettie Belle Farm in Warwick Center raises grass-fed livestock including beef, sheep, pigs, turkeys, geese, chickens and ducks that are available through meat CSAs or for sale at the farm. The Warwick Community School, the elementary school serving the children of Warwick, is part of the Pioneer Valley Regional

¹⁸ Note that the U.S. Census ACS estimates are derived from five years of survey data with an associated margin of error, whereas the labor force number on page 3-27 from the MA Department of Workforce Development, Labor Force and Unemployment Data, is a snapshot in time.

School District and employs twenty-five. The Town itself employs eight individuals. However, many more individuals work for the town as unpaid volunteers or receive a small stipend.

Seven respondents to the 2019 community survey derive income from open space – most from forest products or farms. However, available information suggests that farms or wood producers may engage in work that represents a source of supplemental income. In addition, people employed in the environmental and conservation fields may feel that open space may be indirectly responsible for their work.

It appears that Warwick is a rural bedroom community; 98.7 percent of its working residents earn their living outside of Town. The lack of small businesses outside of home-based companies in Warwick means that expenses incurred for community/public services, must be paid for with revenues generated from taxing residential uses and open space.

Warwick's 2002 Open Space Survey indicated that residents support the provision of better phone and Internet service and the development of cottage industries. A study completed by the Western Massachusetts Connect in 2007 documented the need for public investment as well as private investment in infrastructure and a regional implementation model, in order to achieve ubiquitous broadband access in the region. Many of the findings of this study were reflected in the state broadband legislation enacted in August 2008 that created the Massachusetts Broadband Institute (MBI) with \$45 million in funding from the American Reinvestment and Recovery Act of 2009 helped create the MBI middle mile network, which built a robust publicly-owned fiber highway in the region with a goal of making the region more attractive to private investment in last mile networks. However, due to the regions' rural nature, private investment still did not come, and in 2017 Governor Baker re-initiated the Last Mile Broadband program to support various approaches by towns moving forward.

In 2009 the Town of Warwick implemented a fixed wireless broadband service. A modest \$40k borrowing authorization was approved to make internet available to town government sites. Space on two existing high towers was utilized. Residents could join the system with an upfront investment of \$500 in equipment (by now obsolete) and a monthly payment of \$50. The first 100 adopters made this investment. After three years, the Warwick Broadband Service (WBS) began to finance the investment needed to subscribe and used some Community Development Block Grant (CDBG) funding to assist low income residents with connecting to the service. Eventually the business grew from investing in increasing capacity, so that by now over 220 homes and businesses are served. The monthly fee remains \$50 per month. Eighty percent (80%) of the town's land area is served and more than 90% of the town's population covered. The Town is currently undertaking buildout of an upgraded system including LTE.¹⁹ WBS is promising download speeds of 25 Mbps. This upgrade is supported by \$240k in new borrowing authorization and a \$450k last mile grant from MBI. The Town-owned business has made money every year of operation. The Town expects to upgrade electronics of its system about every ten years to keep pace with change.

¹⁹ "In telecommunications, Long-Term Evolution (LTE) is a standard for wireless broadband communication for mobile devices and data terminals." Wikipedia, [https://en.wikipedia.org/wiki/LTE_\(telecommunication\)](https://en.wikipedia.org/wiki/LTE_(telecommunication)), accessed March 3, 2020.

As telecommunications services become increasingly available, this may attract greater residential development, and for Warwick residents, this is likely to encourage greater home-based business development. Although an increase in cottage industries does not translate directly into significant tax revenues, it may allow more residents to work within the community. Some residents believe that community members will have a greater quality of life if people have the opportunity to work in Town. The Town would welcome and support small businesses that fit in with the rural character of Warwick.

Various regional organizations around Warwick serve the community through economic development initiatives, public health, the protection of forest and agricultural land, and promoting outdoor recreation, sustainable timber harvesting and farming. The North Quabbin Community Coalition provides programs geared towards all people – families, youth, veterans, and elders – hosting events, workshops, advocating for rights, and delivering services. They are the host for the North Quabbin Woods website, which promotes the region as a whole, serving as a directory for local attractions, recreation opportunities, and businesses. The Greater Quabbin Food Alliance, sponsored by the Mount Grace Land Conservation Trust, is an organization which fosters partnerships to address the food system challenges – including food access, farmland conservation, and education. An example of a recent project is the creation of Quabbin Harvest, a community market in downtown Orange.

Mount Grace Land Conservation Trust (MGLCT) is a regional land trust that serves 23 towns in Worcester and Franklin counties. Through private, state, and federal grants, MGLCT protects significant natural, agricultural, and scenic areas, and encourages land stewardship for the benefit of the environment, the economy, and future generations. Since 1986, MGLCT has helped protect more than 32,000 acres. In addition, MGLCT provides staff support and leadership for the North Quabbin Regional Landscape Partnership. The North Quabbin Regional Landscape Partnership is a voluntary association of state and local organizations working together to conserve the Greater Quabbin Region by facilitating landowner outreach, stewardship, municipal outreach, and land protection projects.

By partnering with these organizations, the Town of Warwick can help promote economic development while preserving natural resources. For example, Warwick currently owns approximately 365 acres of Town Forest, which is managed for timber harvest. The Town could purchase or otherwise acquire more forestland and manage the lands primarily for growing timber, although forestlands can be used for recreational activities year-round. Another potential source of income for Warwick's forestlands could be through participating in a carbon market project that pays the Town for managing its forests for carbon sequestration. Well-managed Town Forests can become one of Warwick's most important fiscal assets.

D. GROWTH AND DEVELOPMENT PATTERNS

Warwick's most valuable resources are its people and landscapes. Both make Warwick what it is today, and the Town's economic well being depends on the interdependent relationship

between the two. Community services are paid for by taxes which differ in amount based on the land use (agricultural, residential, commercial, or industrial) and acreage. Developed properties have higher valuations than undeveloped lands, because they require more community services – waste disposal, road maintenance, etc. Even then, some properties may not pay for all the services they are provided, e.g. the annual cost of schooling one household with three children is more than the taxes paid by that same household based on the property’s assessed valuation. Many towns (not Warwick) encourage economic development to offset this inconsistency; commercial and industrial land uses are taxed at a higher rate than residential and agricultural lands so share more of the tax burden. On the other hand, protected open space requires few services and provides a meager share of tax revenues, but reduces the amount of housing that can occur. This section explores this relationship in more detail.

D.1. Patterns and Trends

The Town of Warwick is a sparsely populated community. Its population peaked in 1820 when it began a slow steady decline until the 1970s when residential development began to grow by following early patterns. Historic development patterns included agricultural, manufacturing activities, and the construction of roadways.

Today’s development patterns echo the past where farms were set apart along or near roadways and civic, commercial and industrial activities clustered at a crossroads, along main routes, and often near a river or brook becoming the town center or forming a neighborhood. In Warwick, these first roadways included Old Winchester, Rum Brook, Richmond, Athol, and Wendell Roads.

Warwick’s early settlement (1760s and 1780s) saw most development occur around Warwick Center and in the northwest and southeast following the industries of the time: lumbering and livestock. Mills were built and used products from the forest and farms and low land prices attracted new businesses to Warwick so the town’s population grew.

Although Warwick lost many of its citizens when the southeastern portion of the Town was transferred to create the District of Orange in 1781, the next fifty years saw the community transformed into a manufacturing center with no fewer than 1,256 residents and thirty mills producing lumber, leather, shingles, cloth, boxes, flour, and bricks.

The population began a 100-year decline in 1835 when the railroad was built along the Millers River to the south in Orange. The only increase in population occurred in 1900 when there was timber to be harvested in Warwick’s forests. Interestingly the exhaustion of the timber supply resulted in a land protection movement, which would help to limit the number of acres that could be settled in Warwick.

Between 1960 and 1990 the population of Warwick increased significantly from 426 people to 640. In the first ten years of that thirty-year period, Warwick grew by more than 15 percent, while in each of the next two decades the population grew by roughly 23 percent. Where these

new residents chose to settle can be seen using MassGIS data. The 1971 and 1997 land use data show the predominant land use changes in Warwick to be the conversion of forest to residential uses of 2 acres or larger. This trend has likely continued, but to a lesser degree due to a smaller population increase in recent years.

According to the 2005 Mass GIS land use data (Table 3-9), Warwick has a predominantly forested landscape with small, scattered patches of surface water, farmland, and residential uses. The largest patches of pasture are located at Four Corners, off Chase Road, and around the town center. The three largest pieces of cropland were located north of the intersection of Winchester and Flower Roads near the New Hampshire border, Chase Road, and south of Four Corners off Hastings Road. Residential uses that create openings in the forest cover of between ¼ and ½ acre in size are located on Route 78 within Warwick Center, off Hastings Heights Road, and around Moores Pond. Residential uses in general are located around the town center and scattered along major routes.

According to the County Building Inspector, between 2009 and 2017, eight new homes were built in Town (Table 3-8).

Table 3-8: New Home Built in Warwick per year, 2009-2017

Year	New Dwelling Units Permitted
2009	1
2010	1
2011	0
2012	2
2013	0
2014	1
2015	2
2016	0
2017	1
Total	8

Source: Town of Warwick Building Inspector

Table 3-9: Summary of Warwick Land Use, 2005

Land Use Category	Acres	Percentage of Total Acreage in Town
Forest	21,329	88.6%
Agriculture	616	2.6%
Water	213	0.9%
Residential (<.5 acre lots & multi-family)	10	0.0%
Residential (>.5 acre lots)	437	1.8%
Wetlands	1,229	5.1%
Open Land	82	0.3%
Powerline/Utility	93	0.4%

Land Use Category	Acres	Percentage of Total Acreage in Town
Urban Public/Institutional	8	0.0%
Recreation	35	0.1%
Commercial	0	0.0%
Industrial	20	0.1%
Other	11	0.0%
Total	24,082	100.0%

Source: MassGIS 2005 Land Use Data.

Most of this development is considered to be large lot residential development and has occurred as Approval-Not-Required (ANR) lots. ANR lots meet Warwick's required minimum lot size and frontage on an existing public way and therefore do not need to comply with State subdivision regulations. This is the only type of residential development occurring in Warwick.

There is one zoning district (Residential/Agricultural) in Warwick, which requires a minimum lot size of two acres. The main reason that the two-acre lot size is required is to ensure that a minimum distance between private wells and septic systems is met. Clean drinking water is dependent on locating the septic field in soils that clean the wastewater effectively before it reaches the groundwater. The drawback of 2-acre zoning is that it encourages a sprawling pattern of development, consuming more land per lot.

There are a number of ways to address the "sprawl" (development spread along rural roads and across the forested/farmed landscapes) created by ANR lots. One way Warwick has attempted to do this is to enact a conservation development provision for new subdivision in its zoning bylaw. The new single and/or two family dwellings can be clustered in one or more groups within a development. Building lots are reduced in size and concentrated together with a permanent conservation restriction placed on the remaining open space to prevent future development. Also, Warwick passed a zoning amendment allowing the addition of an apartment to a house. The bylaw recognizes that the size of many older homes is larger than currently needed given the significant decline in average family size over the last few decades.

D.2. Infrastructure

D.2.1. Transportation

The principal highway serving the Town of Warwick is secondary Route 78. Route 78, which passes through Warwick Center, is the major north-south route running through town. It intersects with State Route 2A at its southern terminus; Route 2A connects to State Route 2 which is the major highway through northern Massachusetts. At its northern terminus Route 78 intersects with Route 10 in Winchester, New Hampshire. Also passing through Warwick Center

is the east-west route of Northfield, Gale²⁰ and Athol Roads. These east/west routes connect Warwick to the neighboring towns of Northfield, Orange, and Athol.

Warwick has two designated bicycle routes, both part of the Franklin County Bikeway, which run through Town. The Northeastern Franklin County Route connects Northfield Center and Orange Center, traveling on Route 78 through Warwick. An alternate route to the main Northeastern Franklin County Route, which is less difficult and more scenic, runs along Wendell Road and connects to Route 2A in Orange. There are no designated pedestrian facilities in Warwick besides a sidewalk located at the Town Common, connecting the Public Safety Building (the former old elementary school) with the Town library. Warwick has a number of trails in town, including the New England Trail, that provide for walking and hiking opportunities.

There are also no public transportation systems in Warwick. However, seniors and people with disabilities may access Demand Response transportation services through the Franklin Regional Transit Authority (FRTA).

D.2.2. Water Supply

The Town of Warwick is served almost entirely by private wells. Most residences rely on deep wells; approximately one third to one quarter have shallow wells; and a small number depend on springs. The exceptions are the Town Hall and the Library which are served by a water system that originates from a spring on Mount Grace.

D.2.3. Septic Systems

In Warwick, all sewage is disposed of via private systems. The effectiveness of septic systems is variable and depends on topography, water table, and soils. Dependence on private sewage disposal requires that housing be restricted to soils and slopes that can reasonably be expected to handle on-site sewage systems. Soil types are critical for determining this capacity, and many soils in Warwick are wet, shallow-to-bedrock, or are coarse and stony which provide very little filtration to septic leachate since water passes through soils very quickly. While not precluding development in Warwick, the density and total amount of new development in the near future will in large part be determined by soils and their ability to pass percolation tests.

In many communities across the region, development follows infrastructure improvements. Given Warwick's lack of a community sewer collection system, the relationship between development and infrastructure appears to be a conditional one. If the soil, drainage, and topographical characteristics of the land are favorable, development may occur. If technology remains static, development may be limited to those areas that are already developed. New and/or alternative septic technologies could allow for the construction of homes in areas once thought to be unsuitable for development.

²⁰ At the time of the writing of this plan update, Gale Road is not currently part of the east-west road system linking Warwick to adjoining towns because of a closed bridge. Once the bridge is repaired, the road will again link Warwick to Orange.

D.3. Long Term Development Patterns

Long-term development patterns will likely depend on a combination of land use controls, slope and soil constraints, the amount of permanently protected land, population trends, the impact of development on quality of life issues, the availability of broadband internet service, and the willingness of people to commute relatively long distances to work.

D.3.1. Land Use Controls

The Town of Warwick has three local land use controls: a zoning district, board of health regulations, and the inclusion of conservation development in its zoning bylaws.

Zoning District

The entire Town of Warwick is one zoning district, Residential-Agricultural. In addition, the Town has a Floodplain Overlay District.

There are prohibited uses and uses allowed by special permit in the Residential-Agricultural district. In addition, the Town allows two uses by-right with Site Plan Review: Conservation Subdivisions and ground-mounted solar energy systems located on a specific lot in town. Table 3-7 lists the dimensional requirements for single- and two-family houses. According to the Warwick Assessor's Clerk, in 2018 there were 336 single-family housing units, 3 two-family home and 1 multi-unit dwelling currently in town.

Table 3-7: Selected Features for the Residential-Agricultural Zoning District

Dimensional Requirement	Single-Family House	Two-Family House	Conservation Development
Min. Lot Area	87,120 sq. ft. (2 acres)	174,240 sq. ft. (4 acres)	21,750 sq. ft. (1/2 acre)
Min. Lot Frontage	300 feet	300 feet	100 feet
Min. Front Yard	35 feet	35feet	25 feet

Source: Town of Warwick Zoning By-Law; September 22, 2014.

Having only one zoning district potentially produces both positive and negative impacts on the conservation of Warwick's natural resources. A two-acre minimum lot size may be too small given the soil, ledge, steep slopes and high water characteristics that presently constrain development in many areas of Town. However, a minimum lot size of two acres creates a large footprint that uses more land than may be necessary for a housing unit. If Warwick's population grows, the remaining unprotected open space may be converted at a faster rate than if higher density development was allowed. Warwick's Conservation Development bylaw provides a development choice that helps balance new housing with protection of natural resources.

Conservation Development

Conservation Development as described in Warwick's Zoning Bylaws is described as: "a development consisting of single and/or two family dwellings in which the houses are clustered into one or more groups within the development, and separated from adjacent properties and other groups by undeveloped land. This type of development may be utilized for new subdivisions and access to the Conservation Development shall be from a new road constructed for the subdivision." The minimum area for a conservation development is ten (10) acres. A development would cluster the same number of houses allowed in a standard subdivision of the same gross acreage with the remaining land held as common open land that is permanently protected. A minimum of 35% of the total parcel must be permanently protected open space, not including wetlands, floodplains, land with slopes greater than 25% or other land with development constraints. There are a number of methods of determining the number of houses that are allowed and open space that must be protected. Warwick recently amended its Zoning Bylaws to develop incentives to further encourage developers to pursue conservation subdivisions. A points system has been developed, granting a building lot bonus for such things as increasing the amount of land permanently protected, building certified Energy Star Homes, or allowing a public easement for recreation trails through the parcel.

Massachusetts recently developed a new model bylaw for Open Space Residential Design (OSRD, also known as Natural Resource Protection Zoning (NRPZ) or Conservation Development, as in Warwick), which is included in the Massachusetts Smart Growth / Smart Energy Toolkit. According to the new model:

MassGIS data indicate that about 1.6 million acres of developable farm and forest land are zoned for conversion to residential development at lot sizes of one acre or more. Conventional development of these acres under current zoning and subdivision regulations would be environmentally, fiscally, and in other ways disastrous. Excessive habitat consumption, increased greenhouse gas emissions, unnecessary costs to build and maintain infrastructure, and diminished water quality and quantity are but a few of the negative impacts.

The model encourages OSRD to be *the* as-of-right subdivision method in undeveloped areas of communities, essentially making OSRD the "conventional" way to subdivide. Communities are also encouraged to require at least 65%, but preferably 75%, protected open space, and to utilize a conservation analysis process that clearly identifies protection priorities on a site and areas best suited for new housing. Finally, the model also encourages much greater flexibility for developers in designing the subdivision by removing minimum lot size and frontage requirements all together. In most rural areas, the limiting factor on lot size will be septic and well requirements, though shared septic systems and allowing for leach fields within a portion of the protected open space can be options.

Warwick's Conservation Development bylaw already does a good job of identifying protection priorities and providing incentives to developers. Warwick could consider amending the bylaw to require a Special Permit for any subdivisions that are not proposed as Conservation

Developments, and to consider increasing the percent of open space required. In exchange for greater open space protection, the bylaw could also relax minimum lot size and frontage requirements further to provide for greater flexibility in designing the development. In addition, the current bylaw only allows Conservation Development for new subdivisions. The Town may want to also allow Conservation Development for ANR proposals, where a landowner could create smaller ANR lots but in return protect a large percent of open space. A successful ANR development was created in Orange through that Town's version of Conservation Development, where new house lots were created on an existing road, and in return active farmland was placed under permanent protection.

Large-Scale Ground-Mounted Solar

Warwick's zoning bylaw currently identifies a site in town where ground-mounted solar arrays may be located by-right with Site Plan Review. The bylaw does not address commercial ground-mounted solar arrays that may be proposed in other areas of town. Many towns in Franklin County have adopted bylaws to regulate the siting, construction, maintenance, and decommissioning of large-scale ground-mounted solar installations. These bylaws seek to minimize potential negative impacts of large installations while also encouraging renewable energy by identifying areas in town where these systems would be most appropriate. Bylaws typically limit installations on slopes over 10% or 15%, and require erosion control and stormwater management plans. In most towns herbicides are prohibited for vegetation control, and stormwater management must be included as part of the ongoing operation and maintenance plan. Decommissioning requires re-vegetation of a site. Land clearing must be limited to what is necessary for the construction and maintenance of the system.

Some towns specify land that should not be used for solar systems, such as prime farmland, permanently protected or Chapter 61 land, and NHESP priority habitat and BioMap 2 Core Habitat areas. Towns may also limit the size of any single installation, such as to 5 or 10 acres. To further reduce the impact of large-scale ground-mounted solar systems that result in clear-cutting of forests, towns could require a percentage of forest on the site be placed under temporary protection from development during the life of the installation. The Town of Shutesbury in eastern Franklin County recently adopted a solar bylaw with the following requirement:

B. Mitigation for Loss of Carbon Sequestration and Forest Habitat

If forestland is proposed to be converted to a Ground-Mounted Solar Installation the plans shall designate thereon an area of unprotected (meaning not subject to c. 184, § 31-33 at time of application) land on the same lot and of a size equal to four times (4X) the total area of such installation. Such designated land shall remain in substantially its natural condition without alteration, including unauthorized (by SPGA) forestry/tree cutting, until such time as the installation is decommissioned. The special permit may be conditioned to effectuate and make enforceable this requirement.²¹

²¹ Shutesbury Zoning Bylaw, Section 8.9-3 B.

Warwick may want to consider regulating large-scale ground-mounted solar arrays in areas of town outside of the parcel identified for by-right solar. Large-scale solar installations may not be an immediate threat due to lack of three-phase power in many areas, however, having regulations in place now will protect the town in the future if large-scale solar becomes possible in town.

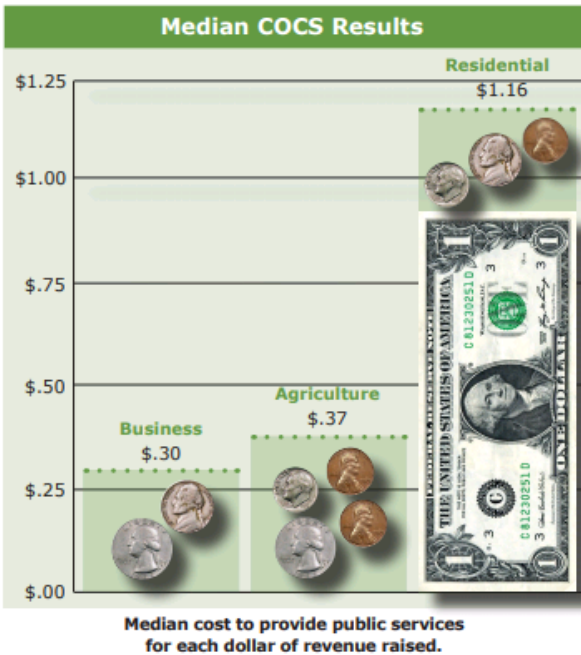
Board of Health Regulations

According to the Town of Warwick's Board of Health Private Well Regulations, all wells for residential development must be located a particular distance from potential contamination sources: sub-surface sewage disposal field (100 feet), cesspool (100 feet), septic tank (50 feet), defined property line (25 feet), dwelling or other structure (25 feet). Also, the regulations state that wells need to be up gradient from all potential sources of contamination, accessible for repair and maintenance, and not in topographically low areas where surface water could accumulate. Combined with Title 5 regulations, these minimum requirements could result in constraining the location and number of new house lots in Warwick in the foreseeable future.

Given the anticipated slight population growth expected for Warwick over the next couple decades, the challenge for Warwick will be to find a model for growth that protects the Town's rural character and promotes a stable property tax rate. In designing the model it is important to understand the measurable values of different land uses. Permanently protected open space (e.g. farmland/forest), residential, and commercial /industrial development each have a different fiscal impact depending on the relationship of property tax revenues generated to municipal services consumed. There is a process by which the fiscal value of these three different land uses are compared within a town to determine whether a use has a positive or negative fiscal impact. This process is called a Cost of Community Services (COCS) analysis.

The American Farmland Trust (AFT) and other organizations have conducted Cost of Community Services (COCS) analyses for many towns and counties across the country. A COCS analysis is a process by which the relationship of tax revenues to municipal costs is explored for a particular point in time. These studies show that open spaces, while not generating the same tax revenues as other land uses, require less public services and result in a net tax gain for a community. Residential uses require more in services than they provide in tax revenues compared to open space, commercial, and industrial land uses. Communities, at the time of the study, were balancing their budgets with the tax revenues generated by other land uses like open space and commercial and industrial property.

Figure 3-9 demonstrates the summary findings of 151 COCS studies from around the country. For every dollar of property tax revenues received from open space, the amount of money expended by the town to support farm/forestland was under fifty cents while residential land use cost over a dollar. Taxes paid by owners of undeveloped farm and forestland help to pay for the services required by residential land uses. When a town has few land uses other than residential, homeowners and renters pay the full cost of the services required to run a municipality, maintain public ways, and educate young people. In this way, local property real estate taxes tend to rise.



Source: American Farmland Trust; 2016. <http://www.farmlandinfo.org/cost-community-services-studies>

The studies provide a fiscal argument for protecting open space, and for implementing good land use planning on the local level. The studies are not meant to encourage towns and cities to implement exclusionary zoning that seeks to make it difficult to develop housing, particularly for families with school age children, who require more in services. Low vacancy rates in Franklin County suggests there is a pent up housing demand in the County as a result of the slow housing market during and following the most recent recession. While demand for new housing may currently be low in Warwick, implementing land use regulations that balance new housing development with land protection will help maintain the open space that provides a net revenue gain to the town, and at the same time help meet the future housing needs of the population.

The challenge for Warwick and other communities is to define what "well balanced" looks like in their community. A land use plan that supports a stable tax base would also need to respect the capacity of the natural resource base. It might allow for the development of small home businesses in a way that encourages local entrepreneurship and modest business expansion, concentrates residential development where possible, and protects forests, remaining farmland, and the most significant scenic, ecological, and historic resources.

SECTION 4

ENVIRONMENTAL INVENTORY AND ANALYSIS

This section of the Warwick Open Space and Recreation Plan provides a comprehensive inventory of the natural resources and significant cultural assets within the Town. The purpose of this section is to provide a factual basis upon which assessments can be made. The inventory identifies and qualifies Warwick's soils, special landscape features, surface waters, aquifers, vegetation, fisheries and wildlife, and unique environments and scenic landscapes.

Each of these resource areas is analyzed from two perspectives. First, the Town's natural resources provide Warwick residents with basic ecological services and cultural amenities. Ecological services include drinking water filtration, flood storage capacity, species diversity, carbon sequestration and climate change mitigation, and soil nutrient levels. Cultural amenities include the recreational use of open spaces; the quality of life benefits that are maximized by maintaining the area's rural character and scenic beauty; and the direct and indirect beneficial impacts that well-conserved natural resources, such as good drinking water and open spaces, have on the local economy. Second, it is important to determine whether the resources require conservation so that the quantity and quality required by the citizenry is sustained.

A. CLIMATE CHANGE IMPACTS

Natural resources, including wildlife and habitats, are being impacted from a changing climate in Massachusetts, and will continue to be impacted as temperatures rise and precipitation amounts change over the coming decades. According to the Massachusetts Wildlife Climate Action Tool,¹ warming is occurring in all seasons, with the greatest changes in winter, at higher latitudes, and potentially at higher elevations. Seasonal warming is extending the growing season, particularly with more frost free days occurring earlier in spring. Precipitation amounts are increasing, especially in winter. Warmer winters are also resulting in more precipitation falling as rain instead of snow, leading to reduced snowpack - though stronger blizzards may lead to locally higher snowpack in Massachusetts and New England. In the summer, heavier downpours combined with longer dry periods are expected, increasing the risk of both droughts and floods. Sea level is also rising at a rapid rate along the Massachusetts coastline, leading to coastal flooding, which is compounded by increasingly intense coastal storms, such as hurricanes.

Natural resources play an important role in mitigating future climate change, but are also vulnerable to its impacts. Local decisions about how natural resources are managed and conserved will play an important role in the ability of people, habitats, and wildlife species to cope with future climate changes. Following is an overview of the two major impacts of climate change for Massachusetts and Warwick: changes in temperature and precipitation. More

¹ <http://climateactiontool.org/content/learning-about-climate-change>.

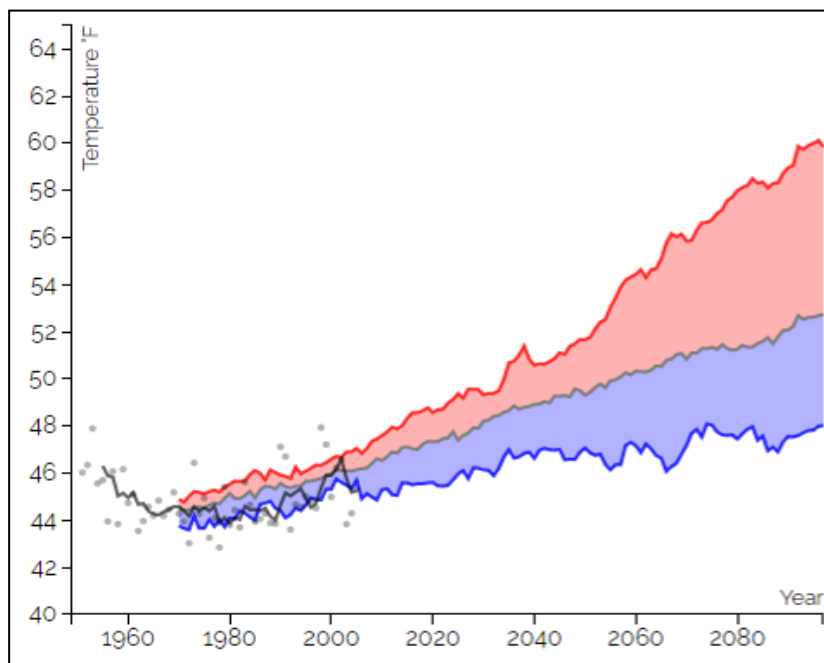
information about specific climate change vulnerabilities due to these impacts as well as adaptation strategies are incorporated into each section of the Environmental Inventory and Analysis.

A.1. Temperature Changes

The northeast United States has experienced an increase in annual temperatures of 1.6°F over the last century, with the greatest warming happening in the winter.² Depending on future global greenhouse gas (GHG) emissions scenarios, average annual temperatures in Massachusetts are expected to be 2.8°F to 6.2°F warmer by 2050 than in the past several decades (when the average annual temperature was observed to be 47.5°F). By 2090, the average annual temperature in the state is expected to increase by 3.8°F to 10.8°F, depending on varying emissions scenarios.³

In the Millers River Watershed, in which most of Warwick is located, overall observed average annual temperature between 1971 and 2005 was 44.8°F. Average annual temperatures in the watershed are expected to increase between 2.3°F and 6.9°F by 2050 depending on future GHG emissions levels (Figure 4-1). By 2090, average annual temperatures in the watershed could increase by 2.9°F to as much as 14.2°F depending on global emissions.⁴

Figure 4-1: Observed (1971-2005) and Projected Average Annual Temperature in the Millers River Watershed



Source: Resilient MA: Climate Change Clearinghouse for the Commonwealth, <http://www.resilientma.org/datagrapher/?c=Temp/basin/avgt/ANN/Millers/>.

² Massachusetts Wildlife Climate Action Tool, <http://climateactiontool.org/content/temperature-changes>.

³ Resilient MA: Climate Change Clearinghouse for the Commonwealth, <http://www.resilientma.org>. Accessed on August 29, 2018.

⁴ Ibid.

In addition to overall warming temperatures, it is expected that an increase in extreme high temperatures will occur. For example, in Massachusetts there will be between 7 to 26 more days over 90°F in 2050 compared to the past several decades. In the Millers River Watershed, it is expected that by 2050, there will be anywhere from 4 to 40 more days with temperatures over 90°F. From 1970 to the mid-2000s, the watershed averaged less than 5 days per year when temperatures reached over 90°F.⁵ Conversely, the watershed is expected to experience fewer days when temperatures drop below freezing (32°F).

A.2. Precipitation Changes

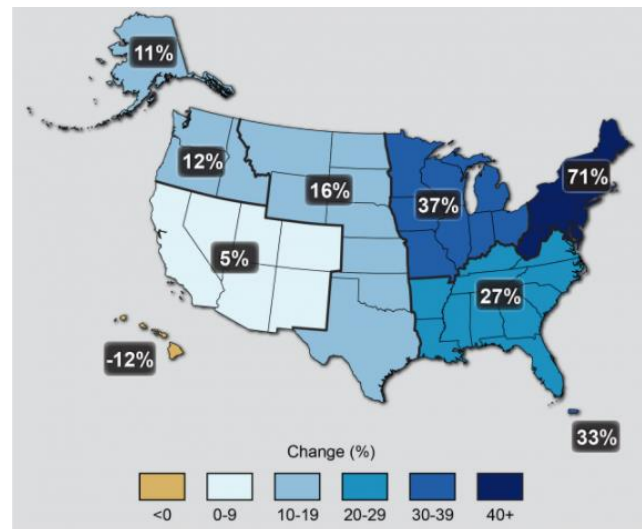
In Massachusetts, annual precipitation amounts have increased at a rate of over 1 inch per decade since the late 1800s, and are projected to continue to increase largely due to more intense precipitation events. The Northeast has experienced a greater increase in extreme precipitation events than the rest of the U.S. in the past several decades (Figure 4-2). Although overall precipitation is expected to increase, it will occur more in heavy, short intervals, with a greater potential for dry, drought conditions in between.

Observed annual precipitation in Massachusetts for the last three decades was 47 inches. Total annual precipitation in Massachusetts is expected to increase between 2% to 13% by 2050, or by roughly 1 to 6 inches. In the Millers River Watershed, annual precipitation has averaged around 45 inches in recent decades. By 2050, the annual average could remain relatively the same (but occur in more heavy, short intervals) or increase by up to 12 inches a year. In general precipitation projections are more uncertain than temperature projections.⁶

A.3. Effects of Climate Change

Climate change is already altering natural habitats and impacting communities in various ways. Ecosystems that are expected to be particularly vulnerable to climate change include coldwater streams and fisheries, spruce-fir forests, hemlock forests, northern hardwood forests, vernal pools and street trees in town centers. Warming temperatures and changes in precipitation will push plant and animal species northward or to higher elevations. Higher temperatures, along with changes in stream flow, will degrade water quality. Coldwater species will decline, while an

Figure 4-2: Observed Change in Very Heavy Precipitation, 1958-2012



The northeast has seen a greater increase in heavy precipitation events than the rest of the country. Source: updated from Karl et al. 2009, Global Climate Change Impacts in the United States.

⁵ <http://www.resilientma.org/datagrapher/?c=Temp/basin/tx90/ANN/Millers/>. Accessed on August 29, 2018.

⁶ <http://resilientma.org/datagrapher/?c=Temp/basin/pcpn/ANN/Millers/>. Accessed on August 30, 2018.

increase in stronger storms leads to more flooding and erosion. A shift to winter rains instead of snow will potentially lead to more runoff, flooding, and greater storm damage along with less spring groundwater recharge.

An increase in extreme weather events, including heavy rains, ice storms, microbursts and hurricanes, will impact natural resources and human communities. Loss of roads, bridges, culverts, buildings, farmland and crops are a few impacts that have already been experienced in the region from increased extreme weather. Sea level rise and more extreme storms on the coast may not directly impact Warwick, but may begin to push some of the millions of people living along the north Atlantic seaboard to move inland, placing development pressure on rural areas.

While climate change will continue to be a major challenge globally, local efforts and decisions have real and lasting impacts on mitigating and adapting to future climate change. One of the most effective, and least costly, strategies is to preserve existing natural areas and manage them for increased resilience to climate change.

B. DOCUMENTING AND MAPPING ECOSYSTEMS

The state of Massachusetts, while relatively small, has many diverse ecosystems and habitats. Documentation and mapping of such ecosystems and habitats – and their contributions to biodiversity and climate change resilience – can be a first step toward protecting and preserving these resources.

B.1 BioMap2

In 2010, the Massachusetts Department of Fish and Game and The Nature Conservancy launched BioMap2: Conserving the Biodiversity of Massachusetts in a Changing World. This project, produced by the Natural Heritage and Endangered Species Program (NHESP), is a comprehensive biodiversity conservation plan for Massachusetts, and endeavors to protect the state's biodiversity in the context of projected effects of climate change.⁷

BioMap2 combines NHESP's 30 years of rare species and natural community documentation with the Division of Fish and Wildlife's 2005 State Wildlife Action Plan (SWAP). It also integrates The Nature Conservancy's assessment of ecosystem and habitat connections across the State and incorporates ecosystem resilience in the face of anticipated impacts from climate change. BioMap2 data replace the former BioMap and Living Waters data.

Core Habitat consists of 1,242,000 acres statewide 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. Core Habitat includes:

- Habitats for rare, vulnerable, or uncommon mammal, bird, reptile, amphibian, fish, invertebrate, and plant species;
- Priority Natural Communities;

⁷ <http://maps.massgis.state.ma.us/dfg/biomap2.htm>.

- High-quality wetland, vernal pool, aquatic, and coastal habitats; and
- Intact forest ecosystems.

Critical Natural Landscape (CNL) consists of 1,783,000 acres statewide, complementing the Core Habitat, including large natural Landscape Blocks that provide habitat for wide-ranging native species, support intact ecological processes, maintain connectivity among habitats, and enhance ecological resilience. The areas include buffering uplands around coastal, wetland and aquatic Core Habitats to help ensure their long-term integrity. CNL, which may overlap with Core Habitat, includes:

- The largest Landscape Blocks in each of 8 ecoregions; and
- Adjacent uplands that buffer wetland, aquatic, and coastal habitats.

Together, BioMap 2 Core Habitat and Critical Natural Landscapes make up 2.1 million acres⁸, or 40% of the land in Massachusetts. Less than half (an estimated 41%) of the BioMap2 landscape in the State has been permanently protected from development. Reports are available for each town and city in Massachusetts detailing the BioMap2 Core Habitat and Critical Natural Landscapes in each community.⁹ Information about Warwick's BioMap2 habitat and landscapes is discussed in more detail in the Environmental Inventory and Analysis sections.

B.2. The Nature Conservancy's Resilient Sites

In 2013, The Nature Conservancy (TNC) released a report entitled "Resilient Sites for Terrestrial Conservation in the Northeast and Mid-Atlantic Region."¹⁰ According to the Introduction of the TNC report, climate change is expected to alter species distributions. As species move to adjust to changing conditions, federal, state and local agencies and entities involved in land conservation need a way to prioritize strategic land conservation that will conserve the maximum amount of biological diversity despite shifting species distribution patterns. Current conservation approaches based on species locations or on predicted species' responses to climate, are necessary, but hampered by uncertainty. TNC states that it offers a complementary approach, one that aims to identify key areas for conservation based on land characteristics that increase diversity and resilience. The central idea of this project is that by mapping key geophysical settings and evaluating them for landscape characteristics that buffer against climate effects, conservationists can identify the most resilient places in the landscape.

The Nature Conservancy's resilience analysis aims to identify the most resilient examples of key geophysical settings (landscapes) to provide conservationists with locations where conservation is most likely to succeed over centuries. An online mapping tool allows users to view the analysis results for their communities and assess specific areas for conservation.¹¹ The Massachusetts Division of Conservation Services' Landscape Partnership Grant Program, which

⁸ Approximately 925,000 acres of Core Habitat and Critical Natural Landscape overlap.

⁹ <https://www.mass.gov/service-details/biomap2-town-reports>.

¹⁰ <https://www.conservationgateway.org/ConservationByGeography/NorthAmerica/UnitedStates/edc/reportsdata/terrestrial/resilience/Pages/default.aspx>.

¹¹ http://www.conservationgateway.org/ConservationByGeography/NorthAmerica/UnitedStates/edc/reportsdata/terrestrial/resilience/resilientland/Pages/Mapping_Tool.aspx.

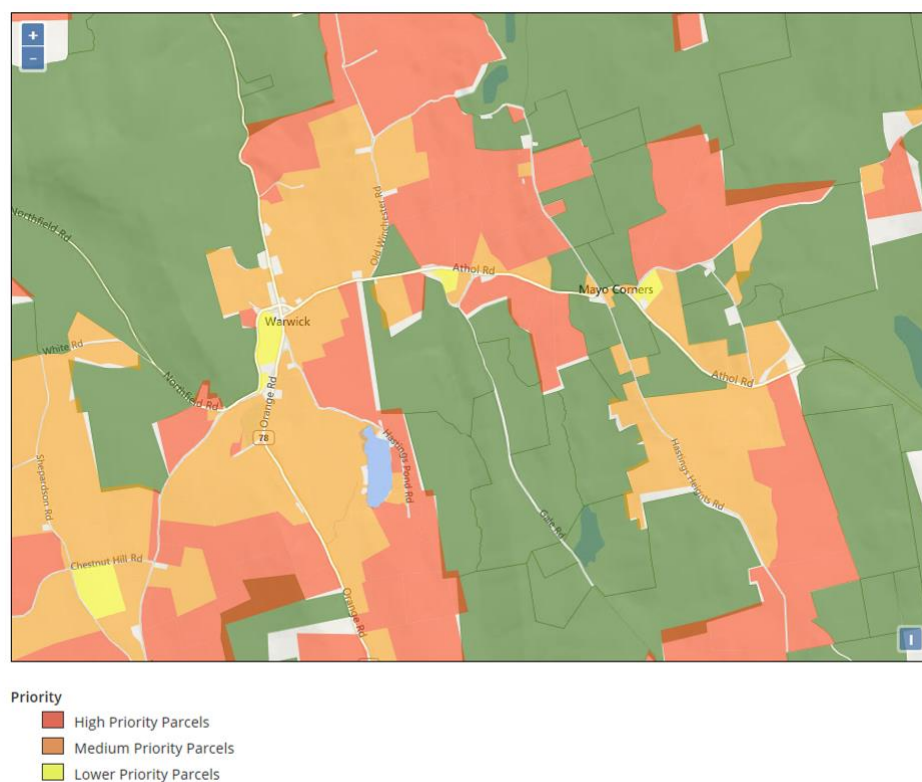
seeks to preserve large, unfragmented, high-value conservation landscapes, including working forests and farms of at least 500 acres in size, specifically references the TNC report and mapping.

B.3. MassAudubon's Mapping and Prioritizing Parcels for Resilience (MAPPR)

Mass Audubon, in partnership with The Nature Conservancy and LandVest, developed Mapping and Prioritizing Parcels for Resilience (MAPPR) to allow Massachusetts conservationists to rapidly identify specific parcels that, if protected, could contribute the most to achieving land protection goals. MAPPR compiles the previous work of BioMap2 and TNC's Resilient Sites, along with other digital parcel information into one online mapping tool.

Mapping and Prioritizing Parcels for Resilience (MAPPR) allows land conservationists to identify the parcels within an area of interest that are the highest priorities for protection based on habitat quality, climate change resilience, and other metrics such as parcel size and adjacency to existing protected parcels. The higher the number and darker the color, the more critical that parcel is for conservation based on selected inputs. The tool can be accessed for free at MassAudubon's website here: <https://www.massaudubon.org/our-conservation-work/advocacy/shaping-the-future-of-your-community/current-projects/mappr-project>

Figure 4.3: An Example of a Map Created Using MassAudubon's MAPPR Tool



C. TOPOGRAPHY, GEOLOGY, AND SOILS

Decisions about land use must take into consideration the inherent suitability of a site for different kinds of development. Understanding the geology, soils, and topography of Warwick is essential for determining the suitability of sites for residential, commercial and industrial development as well as new parks, hiking trails and open space.

C.1 Topography

The Town of Warwick is composed primarily of large rolling hills and steep-walled narrow valleys. Elevations in Warwick range from 466 feet above mean sea level where Mountain Brook leaves the Town on its northern border to 1,621 feet atop Mount Grace. Although most of the narrow stream valleys are steep-sided, portions of two valleys are broad and quite flat, and have much of the best agricultural land in the Town of Warwick. One is the valley adjacent to Mountain Brook north of Flower Hill. The other broad valley is along Darling Brook south of Moores Pond. Other primary stream valleys include those along Orcutt Brook and Tully Brook. The Town of Warwick lies in the Connecticut River watershed which encompasses the Millers River, Ashuelot River, and Mill Brook Basins (sub-watersheds). The southern portion and northeastern quadrant of Warwick drain to the Millers River. The three principal watercourses in the Town that flow into the Millers are Moss Brook, Orcutt Brook and West Branch Tully Brook. Other streams flowing to the Millers River include Rum, Gale, Darling, East Branch Darling, and Hodge Brooks. The northwestern quadrant drains to the Connecticut River via Mill Brook. Mountain (Mirey) Brook flows north into New Hampshire and is a tributary of the Ashuelot River, which flows into the Connecticut River just north of the Massachusetts-New Hampshire border. There are fourteen lakes and ponds, which are located in part or totally within the Town of Warwick.

C.2 Geology

The Town of Warwick is the result of millions of years of geologic history: the movement of the earth's crust (continental drift), the great eruptions of volcanoes, and the sculpting power of moving water, ice, and wind. This distinctive physical base has determined the distribution of the Town's water bodies, the types of soils and vegetation, and past and current settlement patterns.

Approximately 65 million years ago, the entire eastern United States including Warwick was part of a large featureless plain, known as the peneplain. It had been leveled through erosion, with the exception of a few higher, resistant areas. Today, these granite mountaintops, named monadnocks, are still the high points in this region and include Mount Monadnock in New Hampshire, Mount Wachusett in Worcester County, and Mount Grace in Warwick.

Most of Warwick's hydrological system is a remnant of the last ice age (approximately 13,000 years ago). The major streams follow a north-south course with the topography. Smaller

streams flow from uplands feeding the extensive wetlands formed by sedimentation that filled drainage points when the glaciers receded.

The glacier left gravel and sand deposits in the lowlands and along stream terraces. Where deposits were left along hillsides, they formed kame terraces and eskers. Kames are short hills, ridges, or mounds and eskers are long narrow ridges or mounds of sand, gravel, and boulders formed under glacial streams. Both are formed by glacial melt waters.

C.3 Soils

Soils have five basic characteristics: their depth to bedrock; the speed at which they allow water to percolate into the ground; their slope; the amount of surface water that exists in the area; and the amount of boulders and stones present on the surface that make them appropriate or inappropriate for different land uses.

As Warwick plans for the long-term use of its land, at least four soil related questions arise: Which soils constrain development given current technologies? Which soils are particularly suited for recreational opportunities and wildlife habitat? Which soils and substrates impact current and future drinking water supplies? And finally, which soils are best for agriculture? The answers to these questions will help lay the foundation for open space and recreation planning in Warwick. The following describes the soils in Warwick and their uses for agriculture, drinking water, wastewater, recreation, and wildlife habitat.

C.3.1 Soils constraining development given current technologies

Large portions of Bolster Hill, Mount Grace, Little Mount Grace, Bennetts Knob, Mallard Hill, Mayo Hill, Chestnut Hill, Beech Hill and Barber Hill consist of Shapleigh soils. Shapleigh soils are shallow and are located on very steep slopes, from 15 percent to 60 percent, and many areas have ledge outcrops of schist bedrock. Depth to bedrock is generally less than eighteen inches. These soils may severely limit the installation of on-site sewage disposal systems and construction of house foundations.

Beech Hill, Barber Hill, Mallard Hill, Mayo Hill, and other uplands also have large areas of Essex soils, which are often found on the steep terrain. This soil has a slowly permeable hardpan within two and a half feet of the surface. Development constraints within this association vary considerably.

Soils in Warwick that have only slight to moderate limitations for development are the Gloucester soils occurring on flat to moderately steep slopes and Hinckley, Windsor, Carver and Merrimac soils on flat to moderate slopes. The Gloucester soils tend to be extremely stony with boulders also common on the surface. This soil has moderately rapid to rapid permeability and rate of infiltration. The Hinckley, Windsor and Merrimac soils consist of excessively drained, shallow gravelly soils. The Carver soils consist of excessively drained, loamy coarse sand and are found in wooded areas on nearly level to moderate slopes.

Deep fluvio-glacial deposits of sand and gravel accumulated in the valleys of Mountain and Mirey Brooks to the north of the village and Darling Brook to the south of Moores Pond. High quality sandy loam soils have developed on some of these deposits, however many areas have a shallow depth to the water table.

C.3.2 Soils suited for recreational opportunities and wildlife habitat

Different recreational uses are constrained by separate soil and topographical characteristics. Sports fields require well-drained and level soils. Lands with slopes over 25 percent may be attractive to all terrain vehicles (ATVs) and biking and hiking enthusiasts but only if the soils are not easily eroded. Erodable soils include those that are shallow, wet, sandy, or sloped or those with a combination of these characteristics. Depending on the combination of factors, highly erodable soils could have less than 15 percent slopes.

Soils that best support a variety of wildlife habitats include the shallow and fine, sandy Shapleigh soils, and the Ridgebury, Peat, Muck and Walpole soils found in the depressions and saddles in the hills of Warwick, and the areas bordering streams in the valleys. These soils have high water tables during all or most of the year. Warwick might consider identifying and protecting the areas surrounding such hydric or very wet soils. More than likely these soils provide for a diverse array of wetland species habitats. In addition, protecting any remaining high slope areas along ridge tops would protect habitats for large mammals as well as scenic views. Finally, protecting ridge tops and wetlands for wildlife habitat is not sufficient in and of itself. The Town should also assess lands that link these special areas to allow for the movement of animals along corridors between the habitats, both currently and in the future in response to climate change.

C.3.3 Soils and substrate suitable for drinking water supplies

Soils of the Hinckley and Gloucester associations generally have high filtration rates and low runoff potential. The Hinckley association, which drains more easily, forms in valleys on stratified drift. The Gloucester association forms on gently sloping and steep upland areas on sandy till. Both groups of soils provide high amounts of recharge to aquifers.

High infiltration soils are sometimes also poor filtering soils and include Agawam, Carver, Gloucester, Hinckley, Merrimack, and Windsor soils. These are found in the more easily developed areas. These soils provide little filtration to septic leachate as water passes through these soils very quickly, which may not be a problem when the depth to ground water is great. Unfortunately, potential aquifers are usually found where these soil types are located. Development could potentially pollute these aquifers if care is not taken to protect them.

C.3.4 Soils for agriculture

The Natural Resources Conservation Service (NRCS) is responsible for classification of soils according to their suitability for agriculture. NRCS maintains detailed information on soils and maps of where they are located. Designated farmland soils are comprised of three classes of soils that have been identified by the NRCS:

- Prime Farmland

- Unique Farmland, and
- Farmland of statewide or local importance.

These soil classes have been identified as contributing to the agricultural productivity of the country and should be protected from conversion to non-agricultural uses. NRCS defines prime farmland as the land with the best combination of physical and chemical characteristics for producing food, feed, forage, fiber and oilseed crops and that is available for these uses. Prime soils produce the highest yields with the fewest inputs, and farming in these areas results in the least damage to the environment. Unique farmland is land other than prime farmland used for the production of high-value food and fiber crops, with such crops defined by the Secretary of Agriculture. Farmland of statewide or local importance is defined as “farmland, other than prime or unique farmland, that is of statewide or local importance for the production of food, feed, fiber, forage, or oilseed crops.” These agricultural soils are a finite resource. If the soil is removed, or the land is developed, the capacity for food and fiber production is lost.

There are approximately 7,575 acres of prime farmland soils in the Town of Warwick. This constitutes 31 percent of the land area in the Town. However, only about 475 acres of prime farmland soils is actually being used for cropland or pasture. Most of the prime farmland soils have been reforested since the 1800s.¹² The larger parcels of prime agricultural land can be found in the following areas: the valley south of Moores Pond along Wendell Road; south of the village center on the east side of Route 78; east of Hastings Pond; north and west of Harris Swamp; east and north of Wheelers Pond; Four Corners area; northwest of Mallard Hill; along the north end of Old Winchester Road; along Flower Hill Road; and, along Route 78 just south of the New Hampshire border. Many of the soils that constitute Warwick's prime agricultural land include: Agawam, Essex, Charlton, Gloucester, Merrimac, Scituate, Shapleigh, Sudbury, Hinckley and Windsor soils.

C.4 Analysis

It is clear from the above that within Warwick, the geology, topography, and soils provide both ecological services (such as crop production and water purification) and cultural amenities (such as scenic views and hiking trails). The remote ridgelines and steep slopes helped to limit development, thereby enhancing the habitat value of these areas for flora and fauna, and provided opportunities for the State to purchase land that is now part of the State Park and Forest system – Mount Grace, Warwick and Erving State Forests. Residents throughout the region appreciate the scenic value of the highlands such as Mount Grace. In addition, the hills are destination points for hikers and wildlife enthusiasts.

The ecological services and cultural amenities that Warwick’s ridgelines, hills, and soils provide cannot be replaced. They will be diminished, however, with neglect and poor planning. Adopting ridge protection bylaws and exploring ways to conserve prime farmland soils will be required if residents want to sustain Warwick’s rural character and the town’s local recreational and agricultural economy.

¹² MassGIS 2005 land use and prime and statewide important farmland soils datalayers. From analysis conducted by Mount Grace Land Conservation Trust, 2016.

D. LANDSCAPE CHARACTER

Warwick is in the Worcester Plateau Ecoregion of Massachusetts; a landscape of hills and valleys dissected by small, high-gradient, headwater streams. The Warwick Dome, a gneiss dome of the Devonian age¹³ with Mt. Grace at its center, is the central geologic feature of the town.

One of the main landscape features separating Warwick from surrounding communities is that many of its roads are on ridges and hills that run north to south and offer fantastic views of the dominant hills, mountains, and features in the region. The Quabbin Reservoir can be viewed from Mount Grace. Mount Monadnock may be viewed from many places in town including Hasting Heights, Old Winchester Road, and Chase Hill Road. Both the Millers River and the Tully River valleys can be viewed from Chase Hill Road. From Moores Pond Beach one can see Mt. Grace. The views south from Route 78, on top of Barber Hill, and north from Flower Hill Road are fine as well. Despite being a predominantly forested town, Warwick contains an extraordinary number of spectacular views.

Overall, Warwick's landscape is overwhelmingly forested, has exceptionally low road density and is very lightly developed. The conservation of large blocks of high quality, unfragmented forest has become a priority for regional conservation planners. The Nature Conservancy identified and mapped the best remaining matrix forest blocks in the Eastern Region as part of their Ecoregional Planning Program. The Warwick Matrix Forest Block covers the entire town and received the highest possible ranking.¹⁴

In 2012, the Massachusetts Natural Heritage and Endangered Species Program and The Nature Conservancy's Massachusetts Program developed BioMap2 to identify and map areas that are critical to preserving the biodiversity and resiliency of landscapes across the State. Warwick has a large amount of Core Habitat and Critical Natural Landscapes (Table 4-1. See Section B.1. for definitions). These areas are displayed on the Plant and Wildlife Habitat map at the end of Section 4, and discussed in more detail in the following sub-sections. A high percentage of BioMap2 areas in Warwick are protected from development.

Table 4-1: BioMap2 Core Habitat and Critical Natural Landscapes in Warwick

Warwick BioMap2	Total Acres	Percent of Town	BioMap2 Acres Protected
Core Habitat	8,625	36%	71%
Critical Natural Landscape	18,791	78%	62%

Note: Core Habitat and Critical Natural Landscapes may overlap.

Source: BioMap2: Conserving the Diversity of Massachusetts in a Changing World. Warwick Town Report, 2012. Town reports are available online at <https://www.mass.gov/service-details/biomap2-town-reports>

¹³ The Devonian Age was 416 to 359.2 million years ago when the mountains of western Massachusetts were being formed.

¹⁴ <https://www.conservationgateway.org/ConservationByGeography/NorthAmerica/UnitedStates/edc/reportsdata/terrestrial/ecoregional/Ine/Pages/default.aspx>.

E. WATER RESOURCES

E.1 Watersheds

The Town of Warwick lies in the Connecticut River watershed¹⁵ which encompasses the Millers River, Ashuelot River, and Mill Brook Basins (sub-watersheds). The Connecticut is nationally significant. In 1991, Congress established the Silvio O. Conte National Fish and Wildlife Refuge, the only refuge in the country to encompass an entire watershed – the Connecticut River watershed in New Hampshire, Vermont, Massachusetts and Connecticut. Seven years later, in 1998, the Connecticut River became one of only fourteen rivers in the country to earn Presidential designation as an American Heritage River. In 2012, the U.S. Interior Secretary designated the Connecticut River as America's first National Blueway, saying the restoration and preservation efforts on the river were a model for other American rivers.

E.2 Surface Water

The Town of Warwick has approximately 213 acres of fresh open water, which includes tributaries to the Millers, Ashuelot and Connecticut Rivers,¹⁶ and all or parts of fourteen ponds, lakes and reservoirs – Laurel Lake, Richards and Wheeler Reservoirs, and Lily, Hastings, Moores, Hubbards, and Johnsonian Ponds. Both the Millers River and Ashuelot River in New Hampshire are large rivers of statewide importance and historical significance.

The following inventory describes Warwick's streams, brooks, and ponds and focuses on water quality issues and the public access and recreational value of these waters. The 2014 Massachusetts Integrated List of Waters, the 2016 draft Massachusetts Integrated List of Waters prepared by the Department of Environmental Protection (DEP), and the BioMap2 Warwick Town Report, are used as source documents for the Millers River and all listed surface waters within the Town of Warwick.¹⁷ Not all water bodies in Warwick have been assessed by the DEP for water quality impairments.

Many of Warwick's surface waters are classified as coldwater fish resources (CFRs) by the Massachusetts Division of Fisheries and Wildlife (MassWildlife). According to MassWildlife, cold water fish resources are particularly sensitive habitats. Changes in land and water use can reduce the ability of these waters to support trout and other kinds of cold water fish. Identification of CFRs are based on fish samples collected annually by staff biologists and technicians. MassWildlife updates the list of CFRs in the state on an annual basis and maintains an interactive map online. Conservation commissions, planning boards, land trusts, regional

¹⁵ The Connecticut is New England's largest watershed (11,260 square miles) and longest river (410 miles).

¹⁶ According to the US Fish and Wildlife Service, the Millers and Ashuelot Rivers are two of 38 major tributaries to the Connecticut River.

¹⁷ The State is required by the United States Environmental Protection Agency to identify water bodies that are not expected to meet surface water quality standards after the implementation of technology-based controls. In each case, the most severe pollutant is identified. Although the affected water bodies may contain other pollutants, the Integrated List of Waters only includes the results of evaluations upon which DEP has performed some measure of quality control.

planning agencies, and town open space committees can refer to the list and map of CFRs to better inform conservation planning.¹⁸

Coldwater fish resources are particularly vulnerable to warming temperatures and changing precipitation patterns due to climate change, placing increased importance on protecting these resources now. As temperatures rise, species adapted to cool water temperatures will be increasingly under stress. Tree cover in stream riparian areas and around ponds is particularly important for regulating water temperatures. According to MassWildlife's Climate Action Tool, maintaining a forested buffer of at least 100 feet along a stream is ideal, however, even a narrow strip of trees can provide vital shade for coldwater streams. Landowners can help by maintaining forested buffers or planting trees along open stream banks or allowing these areas to return to forest.

In Warwick, the decline of Hemlock due to the woolly adelgid may impact streams in otherwise heavily forested areas. In these areas, landowners should consult a licensed forester for potential management strategies to create a more resilient riparian forest.¹⁹

The northwestern quadrant of the Town drains to the Ashuelot River – Lovers Retreat, Black, Mirey, Kidder, and Mountain Brooks – while all the other brooks except Mill Brook, which is a tributary to the Connecticut River, drain to the Millers River.

E.2.1 Millers River

The Millers River is located in north central Massachusetts and southwestern New Hampshire. From its headwaters in New Hampshire, the Millers River flows south then gradually west through Athol and Orange, ultimately flowing into the Connecticut River. According to the US Fish and Wildlife Service, the Millers River is one of 38 major tributaries to the Connecticut River, New England's longest river and largest watershed. While the Millers River does not run through Warwick, there are eight tributaries to the Millers in the Town. From west to east, these include Moss, Darling, Tully, Orcutt, Poor Farm Brook, Black, Hodge, and Gale Brooks and one un-named stream, a tributary to Orcutt Brook.

E.2.2 Connecticut River

The Connecticut River watershed is the largest river ecosystem in New England. It encompasses 11,260 square miles and flows from its headwaters of Fourth Connecticut Lake in New Hampshire at the Canadian border to Long Island Sound at Old Saybrook Connecticut. Although wholly in New Hampshire, it forms the border with Vermont. The River travels through Massachusetts entering the Commonwealth at Northfield, draining all or part of forty-five (45) municipalities before entering the State of Connecticut. The watershed is 80 percent forested, 12 percent agricultural, 3 percent developed and 5 percent wetlands and water.²⁰

¹⁸ <https://www.mass.gov/service-details/coldwater-fish-resources>, accessed on September 4, 2018.

¹⁹ MassWildlife Climate Action Tool <https://climateactiontool.org/content/ensure-cool-water-temperatures-protect-and-restore-riparian-areas>, accessed September 5, 2018.

²⁰ Silvio O. Conte National Fish & Wildlife Refuge Action Plan and Environmental Impact Statement, US Fish and Wildlife Service, 1995.

All of Warwick's rivers and brooks are within the Connecticut River Watershed. Mill Brook flows directly to the Connecticut, while the other streams in Warwick flow via the Millers and Ashuelot Rivers to the Connecticut.

E.2.3 Ashuelot River

The Ashuelot River watershed is located in northwestern Warwick and is a sub-watershed of the Connecticut River watershed. In northern Warwick, three brooks have their headwaters in Warwick and flow into the Ashuelot River in New Hampshire. Mountain and Kidder Brooks flow together to become Mirey Brook, which like Lovers Retreat Brook, drain into the Ashuelot River, which is located in southwestern New Hampshire.

The Ashuelot River is a Special Focus Area for the US Fish and Wildlife Service for rare species and fisheries.²¹ The Ashuelot River watershed is home to the federally endangered dwarf wedge mussel. According to the U.S. Fish and Wildlife Service, the Ashuelot River is one of the four most important refuges for this mussel in the Connecticut River watershed. The Ashuelot River is currently included in the Connecticut River anadromous fish restoration efforts for species including American shad and American eel.

E.2.4 Other Rivers and Brooks

Mountain and Kidder Brooks

Mountain Brook originates on the eastern side of Mount Grace. It flows a distance of 3.3 miles from Warwick Center north to its confluence with Mirey Brook at the New Hampshire line. Mirey Brook flows through Sunny Valley in Winchester, NH for several miles where it then merges with the Ashuelot River in downtown Winchester. Kidder Brook is a tributary of Mountain Brook and is approximately 3 miles long. Both brooks are part of a large area of Critical Natural Landscape identified in BioMap2 that extends into surrounding towns and overlaps with several Core Habitat areas such as Mount Grace. Kidder Brook is classified as a coldwater fish resource by MassWildlife.

Darling Brook and East Branch of Darling Brook

Originating at Moores Pond, which is fed by Grace Brook, in south central Warwick, Darling Brook flows southwest roughly following Wendell Road. It converges with Moss Brook in the southwest corner of Town, which eventually makes its way to the Millers River in western Orange. Darling Brook is at the center of a 933-acre BioMap2 Core Habitat area that supports Giant St. John's-wort, the Blue-spotted Salamander, and the Wood Turtle, species of conservation concern. Extensive flats border the brook and support a diverse mosaic of wetland and upland habitats. The area supports a healthy population of turtles. Wetlands include open marsh and wet-meadow communities, shrub swamps and wooded swamps. There is an unusually high diversity of open wetland species including many sedges, grasses, and wetland herbs. The headwaters of East Branch of Darling Brook originate in the wetlands on both sides of Route 78, just north of the Fournier Saw Mill site. The brook flows south-west as a rocky stream. It becomes a slow stream passing through wetlands and beaver ponds to join Darling

²¹ Ibid

Brook in the wetland area between Wendell Road and Hockanum Road. The lower end of East Branch Darling Brook is a good trout stream and moose habitat.

Moss Brook

Located in the southwest portion of Warwick, Moss Brook flows out of Black Swamp and converges with Darling Brook southeast of the intersection of Quarry and Wendell Roads. Most of Moss Brook is included within a BioMap2 Critical Natural Landscape that extends into Erving and Northfield and buffers several large blocks of Core Habitat. There is a particularly scenic stretch of the Brook located north and south of the junction of Page and Quarry Roads. With a steep and boulder strewn channel, there are numerous small cascades and waterfall at this site. Flowing through hemlock woods, Moss Brook is particularly beautiful during spring run-off. Moss Brook supports a population of native brook trout and turtles and is stocked with trout.²² Fishing access is good via Wendell Road and Quarry Road. Moss Brook is classified as a coldwater fish resource by MassWildlife.

Rum Brook

Located east of the Warwick Center, Rum Brook flows south towards Gale Pond. It converges with Black Brook and another unnamed perennial stream north of Gale Pond. Rum Brook consists of a twenty-four acre swamp and seventy-two acres of open wetland just north and south of Athol Road. Rum Brook flows through a 68-acre BioMap2 Core Habitat featuring the Spotted Turtle, a species of conservation concern. This small turtle inhabits a variety of wetlands year-round and nests in nearby uplands during spring. Wet meadows require mowing or grazing to keep from succeeding to shrub or forested wetlands. This once common habitat type is growing rare. This meadow was historically kept open by mowing for hay. Most has grown up to shrub-swamp, but a portion has been recently reclaimed. “Reclaiming” wetlands even if they were once agricultural lands is illegal without a permit from the Conservation Commission and DEP.

Black Brook

Located northeast of Warwick Center, Black Brook flows through Richards Reservoir and Richards Mill Pond and converges with Rum Brook southeast of the intersection of Athol and Gale Roads. The Brook is the site of Warwick’s first mill (Ayer’s Mill, 1765) at Richards Mill Pond. The mill stones on the Town Common are from this site. Black Brook flows through two BioMap2 Core Habitat areas, consisting of a 68-acre area featuring the Spotted Turtle, and a 210-acre area south of Athol Road featuring priority natural communities and the Four-toed Salamander and Spotted Turtle.

Hodge Brook

Hodge Brook, located near the center of town, is a perennial stream formed from the intermittent outflow of Hastings Pond and an unnamed tributary, and flows through a scenic gorge east southeast of the center of town at the base of the slope of the Warwick fault. It flows through one of the Town’s geologic scenic sites, the Devil’s Washbowl. Hodge Brook joins Gale Brook just below Gale Mill, as Gale Brook flows into Brush Valley. Hodge Brook flows through a portion of a BioMap2 Core Habitat area featuring priority natural communities and the Four-toed Salamander and Spotted Turtle.

²² MassWildlife web site August 2018.

Gale Brook

Located in southeast Warwick, Gale Brook flows out of Gale Pond and enters Hubbards Pond in Brush Valley just east of Route 78. Gale Brook is the site of the historic Gale Mill. This is one of the better-preserved mill sites in town. Much stonework is still in place and the mill stones are on-site. There is a huge open graminoid wetland south of the old mill site along the brook. The brook is within a large BioMap2 Critical Natural Landscape area. Portions of the land Gale Brook flows through is owned by Mount Grace Conservation Land Trust and the State. Trail access (State right-of-way on privately owned woods road) across Gale Meadow could be improved or could be located on either east or west side of brook.

Orcutt Brook

Orcutt Brook is a perennial stream comprised from the flow of several smaller streams, including Black, Rum, Gale, and Hodge Brooks as well as several unnamed tributaries. Orcutt Brook becomes a named brook as it flows out of Hubbard's Pond in Brush Valley, at the confluence with another small tributary. Orcutt Brook flows through Wheelers Pond before entering the Millers River in West Orange. It supports native brook trout as well as blacknose dace, creek chub, common shiner, and common white sucker. The state stocks the brook with trout in the spring. Orcutt Brook is classified as a coldwater fish resource by MassWildlife.

Tully Brook and West Branch Tully River

Originating in the valley between Mallard and Mayo Hills in eastern Warwick, Tully Brook carries drainage from Warwick State Forest among other lands to Sheomet Lake. Tully Brook is one of the largest and most scenic brooks and runs through one of the least developed regions of Warwick, encompassing two BioMap2 Core Habitat areas. It is also reputed to be a great trout stream, although the dam at Sheomet Lake restricts fish access from the West Branch of Tully River to Sheomet Lake and Tully Brook. Tully Brook is classified as a coldwater fish resource by MassWildlife. Both the brook and Sheomet Lake is stocked with fish by the state. Fish consumption from the West Branch Tully River, which flows south from Sheomet Lake into Orange, is not supported due to PCBs found in fish tissue. In addition, water temperature in the West Branch Tully River has been found to be warmer than what can support cold water fish.

Mill Brook

Originating in northwestern Warwick, Mill Brook includes the drainage from Steven's and Bass Swamps and flows through the Town of Northfield on its way to the Connecticut River. Mill Brook is compromised by its proximity to Northfield Road, which follows the brook and contributes to bank erosion and siltation problems. Improving the stream might be a goal for the Town to consider. The state stocks the brook with trout in the spring and fall. Mill Brook is classified as a coldwater fish resource by MassWildlife.

Lovers Retreat Brook

Lovers Retreat Brook is in the northwest corner of Warwick. It flows into New Hampshire and, as Pauchaug Brook, is a tributary of the Ashuelot River. The brook is part of an extensive BioMap2 Core Habitat area in the northwestern section of town.

Black Brook (NH)

Black Brook flows into New Hampshire and is a tributary of Mirey Brook which is a tributary of the Ashuelot River. Black Brook is part of the same BioMap2 Core Habitat area as Lovers Retreat Brook.

Wilson Brook

Wilson Brook begins near Chestnut Hill Road and flows south to Darling Brook, just south of Moores Pond. Wilson Brook is classified as a coldwater fish resource by MassWildlife.

Grace Brook

Grace Brook begins near the base of Mt. Grace and flows south into Moores Pond. It is listed as a coldwater fish resource by MassWildlife.

E.2.5 Lakes and Ponds

Warwick has five natural ponds: Moores Pond, Hastings Pond, Laurel Lake, Bent Pond, and Lily Pond. All the remaining ponds in Warwick are artificial. Dams were built throughout the 19th Century to store water for mills. Many were restored or rebuilt by the Civilian Conservation Corps (CCC) in the 1930s. Warwick's small headwater streams typically experience periods of zero-flow in the summer, so to store enough water for summer operation, a series of impoundments were often created upstream from the mills. Several historic impoundments have been lost as dams failed, however some of these have been partially restored in recent years by beaver dams. Some of Warwick's finest wetlands are on the sites of former impoundments (e.g. Stevens Swamp, Harris Swamp, Black and Bass Swamps).

Bent Pond

Located in the northwestern corner of Warwick, Bent Pond is a small water body partially located in New Hampshire. It is a naturally occurring warm water, eutrophic water body with no public access, deepened by the dredging of Lovers Brook. This isolated pond is maintained, at least in part, by beaver and used by river otter. Bent Pond is located within a large BioMap2 Core Habitat area.

Lily Pond

Located off Garage Road near Warwick Center, Lily Pond is a five acre natural pond of glacial origin and is termed a "kettle hole." A kettle hole is formed by a large glacial block of ice left in a glacial outflow plain before melting and leaving a concave surface depression, usually without a definable inlet or outlet. Lily Pond is in the bog stage of pond succession supporting a ring bog around the central, shallow open-water area. Lily Pond has good potential for wildlife observation and nature study and was once renowned for hornpout fishing.

Hubbards Pond

Hubbards Pond is a five-acre warm water, eutrophic water body formed by the impoundment of Gale Brook, where the name changes to Orcutt Brook. It is located near the junction of Hockanum and Orange Roads in Brush Valley in the south-central section of Warwick but has no easy access. Hubbards Pond was originally built to store water for operating a sawmill. It has a maximum depth of about six feet. The original dam has partially washed out. Hubbards Pond is located within a large BioMap2 Critical Natural Landscape.

Hastings Pond

Located along the west side of Hastings Pond Road, southeast of Warwick Center, Hastings Pond is Warwick's only completely natural Great Pond²³ and is approximately eighteen acres in area and a depth of 25 feet in the southern end. Hastings Pond is classified as being a stratified, mesotrophic water body capable of sustaining both warm and cold-water fish. Although access to the pond is across private property along Hastings Road, no public access right of way is available and much of the shoreline is undeveloped. Hastings Pond is part of a 37-acre BioMap2 Core Habitat area that supports the Four-toed Salamander, a Species of Conservation Concern.

Gale Pond

Located along the east side of Gale Road in east-central Warwick, Gale Pond is approximately twelve acres in size. It is an artificial, warm water, eutrophic water body. Gale Pond is part of Warwick State Forest and is located within a large BioMap2 Critical Natural Landscape area. Consuming fish from Gale Pond is not advised due to mercury found in fish tissue. The expected source of the mercury is from toxins in the atmosphere from sources such as power plants (located as far away as the Midwest United States) and trash incineration. Gale Pond is also found to not support primary and secondary contact recreation due to turbidity. The source of the turbidity (or high sedimentation) is unknown.

Wheeler's Pond

Located on Orcutt Brook along the west side of Route 78 in the southern section of Warwick, Wheeler's Pond is an artificial pond of twenty-eight acres. It is considered a warm water, eutrophic water body with dark, tannin water. Access to the pond is discouraged as the pond is privately owned. The southern end of Wheeler's Pond is part of an 8-acre BioMap2 Core Habitat area featuring an Aquatic Core habitat - intact river corridors within which important physical and ecological processes of the river or stream occur – and the Creeper, a freshwater mussel classified as a Species of Conservation Concern.

Moore's Pond

Located near the junction of Wendell and South Holden Roads, Moore's Pond is an enhanced Great Pond. It is a stratified, mesotrophic water body of thirty-nine acres and capable of sustaining both coldwater and warm water species of fish. It is stocked with trout. Moore's Pond is developed on its eastern, southern and western shores. Public access is provided along the western shore near Shepardson Road, and at the Town Beach at the intersection of Wendell Road and South Holden Road. The Town acquired the Town Beach parcel in 2010 for use by residents for swimming. Funding for weekly bacteria monitoring during the summer is raised by the volunteer Moore's Pond Beach Committee, and volunteers help with beach cleanup. . There is a state installed unimproved public boat launch on Wendell Road. Motorboats of 10 or more horsepower are prohibited. The pond is popular for swimming, fishing and paddling. The north end of the pond supports a nice pond-shore bog with classic bog vegetation.

Clubhouse Pond - See Sheomet Lake

²³ Great Ponds are naturally occurring ponds that are over 10 acres in their natural state, before humans "enhanced" them.

Rum Brook Impoundment

This is one of the countless small beaver ponds in town. Ephemeral by nature, it is handy for nature study or ice-skating while extant.

Richards Reservoir

Located in Warwick State Forest, north of the intersection of Robbins and Richmond Roads in the northeastern section of Warwick, Richards Reservoir is a thirty acre impoundment. With a maximum depth of eight feet, the Reservoir is best suited for warm water fish. Access for parking and launching non-motorized boats is available along the west side of Richmond Road approximately 0.3 miles north of the former Warwick Forestry Camp. The northern section of the reservoir is part of a 24-acre BioMap2 Core Habitat area featuring a Wetland Core and a Priority Natural Community. 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 at the northern end of Richards Reservoir features an Acidic Shrub Fens, shrub-dominated acidic peatlands found primarily along pond margins in the eastern and central part of the state. According to BioMap2, the Richards Reservoir Acidic Shrub Fen is one of the highest-quality in the state. This fen occurs on a well-developed floating mat without exotic species or human disturbances, and is embedded within a large unfragmented forested area.

Richards Mill Pond

Richards Mill Pond is located in Warwick State Forest in the northeastern section of Town between Robbins Road and Rum Brook Road. A seven-acre impoundment, Richards Mill Pond is a shallow, warm water, eutrophic water body and the site of one of Warwick's first mills. This scenic pond has the potential for boating/canoeing, fishing, hunting, and nature study. With only a 400 foot portage, a canoeist can easily access the thirty-acre Richards Reservoir to the north. Access is available to Richards Mill Pond along East Rum Brook Road.

Sheomet Lake

Sheomet Lake, known locally as Clubhouse Pond, is located in eastern Warwick near Athol Road in Warwick State Forest. It is a thirty-three acre enhanced pond considered to be stratified and mesotrophic. Tully Brook and two unnamed streams feed Sheomet Lake. It is stocked with trout. There is boat access via a ramp at the northern end of the lake, although motorboats are not permitted due to Town zoning prohibiting any motorboat over 10 horsepower. A swimming beach is located along the lake's southeast corner. Although owned and managed by the state park system, there is rarely any presence of rangers at this pond. Sheomet Lake is part of a 210-acre BioMap2 Core Habitat featuring the Ski-tipped Emerald dragonfly, a Species of Conservation Concern.

Laurel Lake

Fifteen of Laurel Lake's forty four acres lie within the Town of Warwick in its southwestern corner. It is managed by DCR as part of Erving State Forest. Laurel Lake is an enhanced Great Pond, which is stratified and mesotrophic, capable of sustaining both coldwater and warm water fish. The lake is stocked annually with trout. Laurel Lake is part of a 60-acre BioMap2 Core Habitat featuring Algae-like Pondweed, a Species of Conservation Concern. Laurel Lake has a public boat access ramp in Erving and a public swimming beach in Warwick. Motorboats of 10 or more horsepower are not allowed in Warwick. Laurel Lake is assessed by MassDEP as not fully supporting fish and aquatic life due to dissolved oxygen levels. The source of this impairment is unknown.

Johnsonian Pond

Johnsonian Pond is located in the southeast area of town, to the east of Hastings Heights Road with access from Town Farm Road in Orange. The pond is partially located in Orange. The dam receives drainage from streams and wetlands in Warwick and drains to Poor Farm Brook in Orange. It is considered good bass fishing.

E.2 Class A Waters

The Town of Warwick does not have any Class A Waters, which are defined as waters designated as a source of public water supply and their tributaries. Class A waters should also be suitable for supporting aquatic life, recreational uses such as swimming and boating and fish consumption.

E.3 Flood Hazard Areas

The Warwick Flood Hazard Boundary Map (FHBM), dated January 24, 1975 identifies the Special Flood Hazard Areas in Warwick, shown as Zone A. These include areas along Mountain Brook, Gale Brook, Darling Brook, and Moss Brook. There are other areas in Warwick that are likely to flood, and indeed have flooded during high water. In major storms, Route 78 and Chestnut Hill Road have washed out. The Flood Plain Overlay District Bylaw was adopted in 2011 regulating land uses in all special flood hazard areas designated as Zone A on the Warwick FHBM. According to 2005 MassGIS land use data, there are 10 dwellings located on 6 acres of Warwick's 259 total acres of floodplain.

In Franklin County, most floodplain maps are several decades old, and may not represent an accurate picture of the floodplain on the ground today. In addition, greater storm intensities as a result of climate change means that flooding that was once considered to have a one percent chance of occurring in any given year is now occurring on a much more frequent basis. In addition to the 100-year floodplain, there are a number of rivers and feeder brooks in Warwick with the potential to cause localized and/or chronic flooding. According to the 2014 Warwick Multi-Hazard Mitigation Plan, flooding events in Warwick have been growing more serious and extending in duration in recent years. Key areas of concern include:

- Winchester Road
- Wendell Road/Moss Brook

- Hockanum Road (box culvert)
- Gale Meadows on Athol and Gale Roads
- Kidder Brook on Robbins and Old Winchester Roads
- Bass Road

The Plan identifies potential measures to mitigate flooding in these areas:²⁴

- Winchester Road—replace culvert across Mountain Brook, stabilize the brook banking along Winchester Road from Garage Road down to where Mountain Brook crosses Winchester Road and install new guardrail. The culvert is 42 inches at the inlet but narrows down to 38-inch wide concrete poured walls on the outlet side, creating a pressure point. This portion of Route 78 washed out during Tropical Storm Floyd in 1999 due to the culvert plugging up. Since that time only emergency repairs have been made, consisting largely of adding more riprap.
- Wendell Road—either re-align the road away from Moss Brook or do bank stabilization including guard rail installation and deal with drainage issues of water permeating under the pavement going to Moss Brook. This would include dealing with a poor base and sub-base under the existing roadway beginning at Moss Brook bridge going to the Orange Town Line.
- Hockanum Road—replace the concrete slab over granite stone side wall box culvert that is not big enough to handle water flow of Darling Brook during high flow event with a bottomless box culvert. The problems are partially due to beaver issues above and below the box culvert on private property.
- Robbins Road—the five-foot metal culvert with Kidder Brook flowing through has had problems in the past during high water events. The culvert also receives water from Old Winchester Road culvert crossing that includes two pipes, one of which is 5-foot and the other is 4.5-foot. In 2007 the Conservation Commission indicated that a bridge was needed in this area according to stream crossing regulations.
- Old Winchester Road—the two culverts mentioned above in the discussion of Robbins Road are at different elevations, with the 5-foot culvert at a lower elevation than the 4.5 foot culvert. The 5-foot culvert directs the flow of the Kidder Brook down toward the Robbins Road culvert crossing. The 4.5-foot culvert only flows during high water events. Because of their interconnected nature, mitigation efforts on the culverts on Old Winchester and the one on Robbins Road would need to be coordinated so that they were either both done at the same time or the Robbins Road work done first.
- Bass Road—replace the 6-foot culvert that Bass Swamp flows through to Mill Brook. The biggest issues are beaver problems on private property above the culvert and the beaver dams along Northfield Road below the culvert along the Mill Brook.

²⁴ *Town of Warwick 2014 Multi-Hazard Mitigation Plan*, pages 17-18.

- Gale Road—a wood plank bridge mounted on a combination of steel and wooden tresses setting on stone abutments which allows the Gale Pond to flow under Gale Road going into Gale Brook. A private dam located on Gale Brook could cause flooding onto the Route 78 floodplain in the event of a breach.

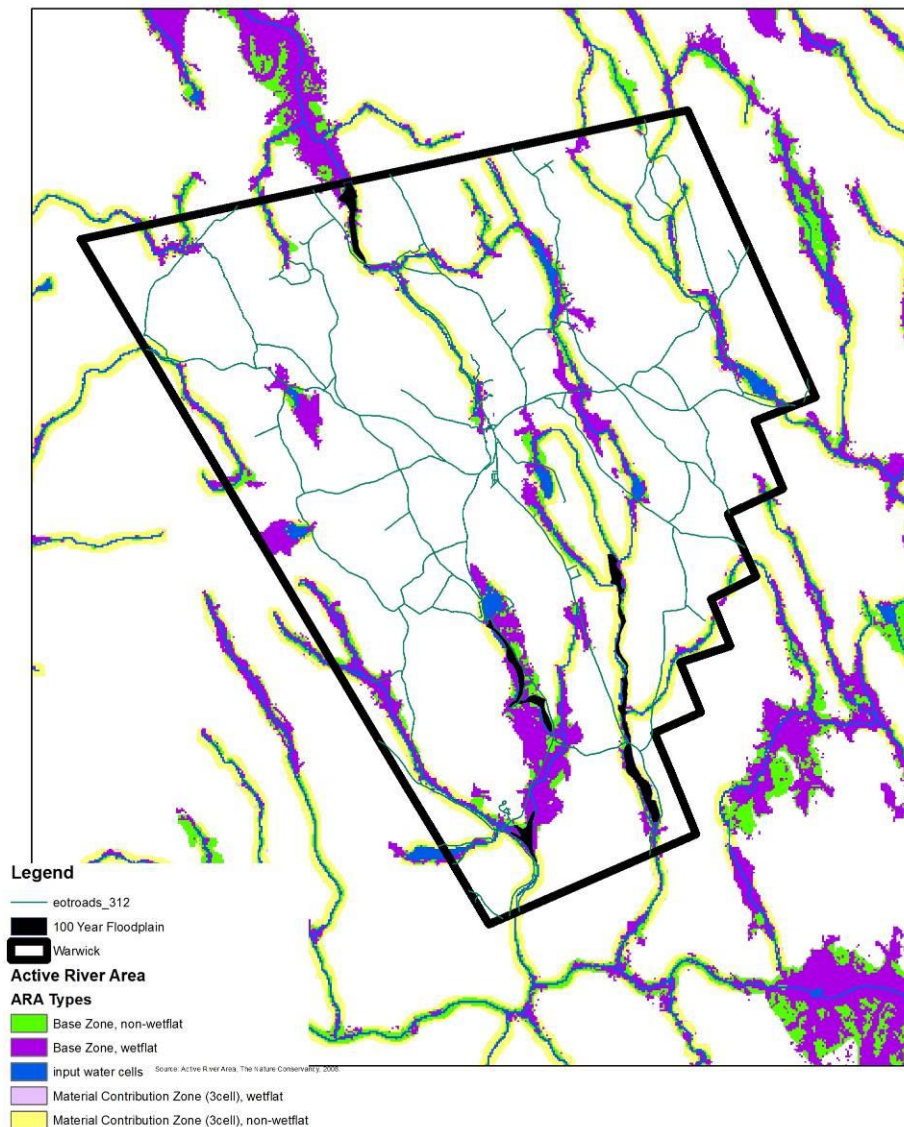
E.4 Active River Areas and River Corridor Mapping

Rivers and streams are dynamic systems in a constant state of change. Fluvial erosion is a natural process of wearing away of soil, vegetation, sediment, and rock through the movement of water in rivers and streams. While erosion is a natural process, the rate of erosion is affected by human alterations of river channels or land as well as a changing climate. Sometimes buildings and roads are located too close to river banks and areas of active river processes, placing them at risk to erosive forces while at the same time increasing the rate of erosion within the river corridor due to loss of flood storage in the floodplain. The most severe fluvial erosion events in recent years have resulted from heavy rain, such as Tropical Storm Irene in 2011, which washed out roads across Franklin County and destroyed several buildings.

The Nature Conservancy (TNC) developed a conservation framework for protecting rivers and streams called the Active River Area (ARA). The active river area is an important tool for stakeholders and decision-makers because it presents a river as a dynamic system with a broad range of conditions that are typical of natural river systems. The active river area may be narrow in some areas, and wider in others, and captures the living, dynamic process of the river. In many areas the ARA may be similar to existing 100-year floodplain mapping, but in other areas it may diverge from the floodplain. Figure 4-4 shows the ARA in Warwick. There are many areas in town where the ARA extends well beyond the 100-year floodplain. The ARA mapping is most appropriate for regional and watershed scale conservation planning and analysis. However, at the town level, more detailed mapping and assessment of the relevant parts of the active river area are necessary to support land use regulation and protection strategies as well as to identify restoration projects.

The Franklin Regional Council of Governments (FRCOG) developed a draft model bylaw that could be used in conjunction with river corridor mapping in a community. The objective of a River Corridor Protection Overlay zoning bylaw is to guide and encourage measures and improvements within the active river area that provide increased property and infrastructure protection, while maintaining and restoring the health of river systems. The benefits of a healthy river system include: flood mitigation, public water supplies, wildlife habitat, and improved conditions for recreation. Communities that have completed river corridor maps can assess their risk to fluvial erosion hazards and consider adopting a River Corridor Protection Overlay Bylaw using the model as a guide.

Figure 4-4: Warwick with Active River Areas



Warwick's Active River Areas are shown in green, purple, pink, and yellow. The FEMA 100-Year Floodplain is shown in black. Source: The Nature Conservancy.

E.5 Wetlands

Warwick's topography of large rolling hills and narrow, steep-sided stream valleys is not conducive to the development of extensive, interconnected wetland systems found in the flatter topography of neighboring towns. Warwick also lacks any major river system with associated wetlands and well-developed floodplains. Despite this, Warwick has extensive wetlands throughout the town.

Most of Warwick's wetlands are small (under fifty acres) and scattered on the occasional flats along stream courses and in depressions between hills. The 1,229 acres of wetlands include

wooded swamps, shrub swamps, shallow marshes, bogs and other wetland types. Although these areas are not considered to be extremely large, they seem to support abundant wildlife and fisheries resources. The named wetland areas in Warwick include the following:

Harris Swamp

This swamp is located in southern Warwick, along Wendell Road. This was formerly Harris Pond, the largest pond in Town in the late 1880s. It is primarily a red maple swamp today. It is included in a 933-acre BioMap2 Core Habitat that features the following Priority Natural Communities: Acidic Graminoid Fens, Forest Seeps, Kettlehole Level Bogs, Northern Hardwoods-Hemlock-White Pine Forest, and Shallow Emergent Marsh. These features help support the following Species of Conservation Concern: Giant St. John's-wort, adult and juvenile Blue-spotted Salamanders, and Wood Turtles. The entire wetlands area includes the flats all along Darling Brook south of Moores Pond. This area is of particular importance not only for its size and diversity of wetlands types it supports, but because of its tremendous water holding capacity providing flood protection for downstream areas. Underlying soils are highly permeable, indicating the area is a likely aquifer recharge area.

Bass Swamp

Located along the west side of Northfield Road near the intersection of Bass Road, Bass Swamp is approximately fifty-seven acres in size. The swamp is formed by the height of the culvert above the stream under Bass Road which is (small dam) located at its northern end. About fifteen acres of the swamp consists of open, fresh water less than five feet deep, twenty acres consists of deep fresh water and eleven acres each of shallow fresh marsh and shrub swamp. Bass Swamp is an unusual and diverse example of a naturally maintained wet meadow. Periodic flooding appears to keep woody species in check sufficiently for a diverse community of grasses, sedges, and wetland herbs to persist. The stream, which meanders through the center of the wetland, is sandy bottomed, and sand underlies the shallow peat deposits of the meadow. This is among the most significant wetlands in Warwick. It is part of a 156-acre BioMap2 Core Habitat area featuring Aquatic Core and Acidic Shrub Fens that supports Spotted Turtles and American Bitterns, which are heron-like birds that nest primarily in large cattail, tussock, or shrub marshes and are very sensitive to disturbance. Bass Swamp was used as a migratory stopover by a Sandhill Crane in 2008; this is an unusual bird sighting for New England. It also has excellent public access and is considered as a site for skating and dog swimming.

Stevens Swamp

Located in Warwick State Forest on the Northfield-Warwick border west of Flagg Road, Steven Swamp is approximately ninety-two acres in size. This wetland is formed by a small dam at its eastern end. About fifty acres of this wetland consists of open, fresh water less than six feet deep. Stevens Swamp is probably as fine an example of a pond-shore peat land as exists anywhere in Massachusetts. It has elements of both bog and poor-fen vegetation and supports an impressive diversity of peat land species. It is included as part of an extensive, 93,990-acre BioMap2 Core Habitat area, and is identified as a large example of a Level Bog in excellent condition with an extensive buffer of natural vegetation and high species and structural diversity. This swamp is considered to be good for canoeing, picnicking, ice skating, and dog swimming.

Black Swamp

This swamp is located near the headwaters of Moss Brook, west of Page Road, in southwestern Warwick. It is part of an extensive 93,990-acre BioMap2 Core Habitat area.

Cranberry Bog

A small three quarter acre kettle bog exists approximately 0.3 miles west of Richards Reservoir and 0.2 miles south of Robbins Road. Bog laurel, pitcher plant, and wild cranberries are all members of the plant community covering the bog. This is a classic kettle-hole bog, roughly circular in outline, dominated by sphagnum moss and sedges with only a sparse shrub cover. Cranberries (both native species) are common, giving rise to the local name for this site. Species diversity is rather low as compared to other examples of similar habitats in the region.

Kettle Bogs on Gale Road

Two or three small kettle depressions along Gale Road have nicely developed (but small) bogs. Vegetation is fairly typical for the type. One on the west side of the road, north of Gale Pond has several vernal pools which breed huge numbers of wood frogs and spring peepers every year.

E.5 Aquifer Recharge Areas

An aquifer is an underground body of water that is typically found in layers of sand deposited during the glacial period. According to MassGIS, Warwick contains five major and six minor low-yield aquifers. A low-yield aquifer is said to provide a potential yield of between 0 and 50 gallons per minute. The major low-yield aquifers are found in soils surrounding the wetlands associated with Grace and Darling Brooks, Mountain and Kidder Brooks, Gale and Orcutt Brooks, Mill Brook and Bass Swamp, and Tully Brook and Sheomet Lake (*See Water Resources Map*). The six minor low-yield aquifers are scattered about in the northwestern and northeastern corners of Town, within Steven's Swamp, and around the headwaters of Moss Brook.

Although climate change is resulting in an increase in precipitation overall, it is occurring in heavier, shorter periods, with more intense dry spells in between. More intense rainfall leads to greater amounts of water running off the land into rivers and streams instead of infiltrating into the ground. In addition, more rain is expected in the winter, reducing snowpack and spring melting that helps recharge aquifers. Higher risk of drought may stress underground water resources.

Conserving natural areas in aquifer recharge areas is critical to help ensure groundwater recharge. Forested areas capture and slow precipitation, allowing more water to infiltrate the ground. In addition to land conservation, zoning and subdivision regulations can regulate impervious surface area and the amount of natural vegetation clearing allowed with new development. Regulations can also encourage or require Low Impact Development (LID) stormwater techniques that infiltrate water runoff on site.

LID is a group of land use development techniques that capture water and rainfall on site, filter it through vegetation and let it soak into the ground before entering the water table. In rural areas, LID strategies use careful site design and decentralized stormwater management to reduce the

environmental footprint of new growth. New homes are sited where they will create the least impact on natural hydrology and other ecological, scenic, or historic resources. Stormwater is managed in small decentralized structures such as grass swales and rain gardens that may be more consistent with the rural character than traditional “pipe and pond” systems. The width of roads and the amount of impervious surfaces are kept to a minimum to reduce stormwater runoff.

In 2016, the Millers River Watershed Council (MRWC) partnered with the Franklin Regional Council of Governments (FRCOG) on the Western Millers River Watershed Low Impact Development (LID) project. Funded through the EPA's Section 319 Nonpoint Source Pollution Grant Program, the two organizations worked with seven towns in the Franklin County portion of the watershed, including Warwick, to provide LID education and technical assistance to develop LID bylaws and ordinances. Materials were developed as part of the project to help communities incorporate LID into local bylaws and stormwater mitigation and flood control activities, which were provided to Warwick and are available on the FRCOG website.²⁵

E.6 Surface Water Reservoirs

Although Warwick contains several water bodies, which are called reservoirs, there are no drinking water reservoirs in Town.

E.7 Potential Sources of Drinking Water Supply Contamination

The potential sources of contamination of private wells in Warwick are on-site septic systems, sub-surface fuel tanks, manure piles, feed lots, and driveways and runoff of road salt. According to the Private Well Regulations of the Warwick Board of Health, all wells must be located a particular distance from these potential contamination sources. These are all examples of non-point or point source pollution. Although most of these sources can be negated through regulation of uses, road runoff of salt, herbicides, and other contaminants may be best addressed through changes in winter road salt use and education of the general public in the proper handling, use, and storage of hazardous materials including petroleum based products like gasoline and motor oil. Warwick does not use herbicides to control roadside vegetation. Currently, the Town’s policy is to use salt only on paved roads, and sand only on gravel and dirt roads. By not mixing salt and sand, the Town now uses less salt and less sand on the roads. In addition, in 2017, a low salt area was re-established in the center of Town.

In 2016, the State carried out a Source Water Assessment Program (SWAP) Report²⁶ for the Warwick Community School to evaluate the water quality and to determine if any of the surrounding land uses could be potential sources of contamination. The report concludes there is a moderate threat to water quality in the surrounding area and due to the absence of a hydrogeologic barrier to prevent contamination migration. The septic system leach field is located within the larger area that contributes water to the well, meaning if the system fails or is not properly maintained, it could be a source of microbial contamination. Another threat is the

²⁵ <https://frcog.org/program-services/natural-resources-planning/green-infrastructure-and-low-impact-development/>

²⁶ <https://www.mass.gov/files/documents/2016/08/or/1312012.pdf>

floor drain in the boiler room which discharges into the septic system. There is potential for hazardous materials to flow accidentally into the floor drain which could contaminate the well water. The report recommends routine inspection and maintenance of the septic system, education on the proper disposal of hazardous chemicals, and to look into including the school well's service area in an Aquifer Protection District Bylaw. The MA DEP Wellhead Grant Protection Program provides funds to assist public water suppliers in projects that protect water quality.

E.8 Analysis

From this inventory it is clear that Warwick contains a diverse array of ponds, lakes, and wetlands that have been utilized in the development of the community and for the enjoyment of its citizens since the Town's establishment. It is also clear that many of these water bodies contain special natural communities important to the region's biodiversity and climate resilience. The common element between wetlands, streams and brooks, ponds, and groundwater wells is obvious; it is water. Keeping that water clean everywhere in Warwick is very important to residents. The permanent protection of forests from development will do much towards ensuring that brooks and streams will continue to be home to a diverse array of plants and animals and that the associated wetlands will continue to exist to help slow floodwater energy.

The main sources of contamination to the water in Warwick may be contaminated stormwater runoff and failing septic systems. Warming temperatures and changes in precipitation due to climate change, including heavier precipitation events and more rain in the winter, pose threats to Warwick's water resources. Conserving, and in some cases restoring, natural areas is key to maintaining the quantity and quality of Warwick's water into the future. This may be accomplished through a combination of strategic land conservation and management, resident and landowner education, and revisions to Warwick's land use regulations.

F. VEGETATION

Warwick currently has many large patches of interior forest, which when combined with forest edges, fields, early successional tree growth, wetlands, and riparian corridors, are best for maximizing regional biodiversity. Larger contiguous patches provide more deep interior area for forest-dwelling species. Larger patches are also important for species that require areas without excessive disturbances from human-based factors, and that rely on other interior species for food. For example, unlike white tailed deer, bobcats are not normally observed along the field edges. The interior areas provide habitat for specialist predators and for mammals that require larger home ranges.

F.1 Forests

Forest areas are considered the Town of Warwick's most abundant natural resource. As of 2005, according to MassGIS, forests comprise over 20,000 acres in Warwick, roughly 90 percent of the

Town's total land area. Forests in Warwick are classified as transition hardwoods-white pine forest (USDA; 1992). Within this forest type, northern hardwoods such as yellow and paper birch (*Betula alleghaniensis* and *B. papyrifera*), American beech (*Fagus grandifolia*), and sugar and red maple (*Acer saccharum* and *A. rubrum*) are the major species. On the dryer sites, red oak (*Quercus rubra*) is the most abundant deciduous species. Hemlock (*Tsuga canadensis*) occurs in the moist cool valleys, north and east slopes, and sides of ravines of Warwick. White pine (*Pinus strobus*) is characteristic of the well-drained sandy sites. The transition hardwood-white pine forest type commonly occurs up to an elevation of 1,500 ft. above sea level in upland central Massachusetts and southern New Hampshire, northward through the Connecticut Valley.

Forests provide for many of Warwick's available recreational opportunities including walking, hiking, fishing, skiing, snowshoeing, hunting, snowmobiling, picnicking, and nature study. Access to the forests is primarily from Warwick State Forest, Mount Grace State Forest, Warwick Town Forest, Warwick Wildlife Management Area, Arthur Iverson Conservation Area, and from woodland roads. Outside of state forests and permanently protected lands owned by conservation organizations, the remaining forestlands in Warwick are privately owned.

Two potentially unique stands of forest trees include an old growth stand on the steep western slope of Mt. Grace and a small pure beech stand on Town land near the town dump. According to *BioMap2*, Warwick contains four areas of Forest Core Habitat. Forest Cores are the best examples of large, intact forests that are least impacted by roads and development, providing critical habitat for numerous woodland species. The Forest Cores in Warwick are located in the north-east and north-west corners of town, along the Northfield border on the western side of town, and along the Orange border in the south-eastern section of town. These Forest Core areas contribute to a larger 93,990-acre Connecticut River Core Habitat area. Several Priority Natural Communities found within Warwick's Forest Cores include an example of an Acidic Rocky Summit with unusual topographic diversity in good condition, a Black Gum Swamp in excellent condition with good structural and species diversity, and a Hemlock Ravine with a classic near-monoculture of Eastern Hemlock with minimal disturbance by humans.

Warwick contains 11,881 acres of State Forest, accounting for roughly 49% of the land area in town. These forests provide many recreational activities for residents and contribute to Warwick's BioMap2 Forest Core areas. In 2012, the Massachusetts Department of Conservation and Recreation (DCR) adopted landscape designations for the State and urban parks system, including State Forests owned by DCR. The landscape designations are based on the Forest Future Visioning Process, a statewide public outreach process completed in 2009 and 2010 that resulted in forest stewardship and management recommendations for DCR lands. The three landscape designations – reserves, woodlands, and parkland – have different management goals and guidelines:

Reserve – The least fragmented forested areas where ecological processes will predominate and inform management, and where commercial timber harvesting is not allowed.

Woodland – Forested areas actively managed for forest health, resource protection, sustainable production of timber, and recreation.

Parkland – Areas providing public recreation opportunities, connections to nature, and protection and appreciation of natural and cultural resources.²⁷

In Warwick, State Forests include all three designation types. A block of Warwick State Forest along the western border of town south of White Road to the Orange town line is designated as a reserve. This reserve connects with State forest reserves in Orange and Wendell. Most of the remaining State forest in Warwick is designated as woodland. Several smaller areas of parkland are designated within the woodland and reserve areas. These include an area surrounding Laurel Lake in the Erving State Forest, an area surrounding the peak of Mt. Grace in the Mt. Grace State Forest, and a small circle of land within the Warwick State Forest in the southwest corner of town.

Forests play a critical role in mitigating future climate change. Forests sequester and store carbon in tree roots, stems, branches and leaves, and in forest soils. In Massachusetts, it is estimated that forests sequester 14% of the state's gross annual carbon emissions, according to Mass Audubon. Climate change is also impacting forests in many ways. A longer growing season and increasing temperatures are shifting habitat conditions for trees northward and to higher elevations. Over time, the birch-beech-maple forests typical of New England will decline while oak-hickory forests more typical in areas south of New England will thrive. An expected increase in periods of drought between intense precipitation events may weaken trees, leaving them more susceptible to insects and diseases. Warmer temperatures may favor invasive plants over native species, and is already resulting in more widespread damage from pests and diseases that in the past were kept in check by colder temperatures.

The 2016 publication “Increasing Forest Resiliency for an Uncertain Future” by researchers from UMass Amherst, the University of Vermont, and the U.S. Forest Service²⁸ focuses on addressing the impacts of various stressors on New England's forests and offers recommendations for foresters, conservation groups, landowners, and municipal officials on how to increase forest resiliency in an uncertain future. The main stressors highlighted in the report include forest conversion, invasive plants, invasive insects and disease, over-browsing from deer, and climate change. These stressors interact with one another to increase their negative impacts, making it all the more important to address them as part of a larger whole.

Maintaining healthy forests well into the future will necessitate addressing these stressors in an effort to increase forest resiliency. Forest resiliency is the capacity of a forest to respond to a disturbance by resisting damage or stress and recovering quickly. The authors break down forest resiliency into four goals: keep forest forested and connected, reduce stressors, reduce vulnerability, and provide refuge. Depending on the forest type, location, history, and surrounding landscape, forests will have varying degrees of vulnerability and resiliency.

²⁷ *Landscape Designations for DCR Parks & Forests: Selection Criteria and Management Guidelines*. Massachusetts Department of Conservation and Recreation. March 2012.

<https://www.mass.gov/files/documents/2016/08/qq/management-guidelines.pdf>

²⁸ *Increasing Forest Resiliency for an Uncertain Future*. Catanzaro, Paul, Anthony D'Amato, and Emily Silver Huff. 2016. <https://masswoods.org/sites/masswoods.net/files/Forest-Resiliency.pdf>

Keep Forest Forested and Connected

Converting forests to other uses may impact the benefits the forest provides. Much of the forest in Warwick and New England was cleared in the 1800s for farming and timber. Over the past 150 years, forests in the region have regrown. More recently, however, the amount of forestland in New England has begun to decline again due to development. As most of the land in New England is family forest, owned by families and individuals, the decisions these family forest owners make about their land moving forward will likely be the most important drivers of forest change. The average age of family forest owners is over sixty, meaning the coming years will see a very large intergenerational transfer of land ownership. It is important for these landowners to make formal plans for the future of their land. Landowners can work with a local land trust or conservation organization to investigate options for conserving their land.

Conserving resilient forests and the linkages between them will help plant and animal species move to more suitable habitats as the climate changes. Large, intact forested areas will also be more likely to recover from extreme events such as droughts, wind storms, ice storms, and flooding. Although individual parcel sizes may be small, conserving critical connections between larger core habitat areas can make a big difference in species migration. In addition to land protection, communities can implement land use regulations that encourage natural resource conservation and minimize forest fragmentation and land clearing for development.

Reduce Stressors

There are many steps forest landowners can take to limit the amount of stressors that forests face to increase overall vigor and health. Invasive plants can out-compete native plants and decrease overall plant diversity by dominating forests and reducing regeneration of native trees and plants. Invasive insects, like the hemlock woolly adelgid or the Asian long-horned beetle, have no natural predators and are significantly affecting species composition as trees susceptible to these insects are selectively killed. Landowners can work with foresters to prevent the introduction of invasive species, remove small populations of existing ones, and learn to manage extensive areas of infestation. Deer browsing can be so intense in some areas that regeneration of certain species can be inhibited. Limiting the impacts of deer browsing can be accomplished through allowing deer hunting to control deer populations, leaving tree tops whole that have fallen to the ground in order to provide enough light for seedlings to grow while also sheltering them from browsing, and protecting seedlings using temporary fencing or deer repellants.

Forest landowners can also take steps to maintain or restore soil and water health by ensuring forestry best management practices are used when conducting a timber harvest to reduce soil compaction and erosion and to promote soil fertility. Recreation on forest land can be directed away from easily erodible soils or other environmentally sensitive sites. Maintaining or restoring forested riparian buffers around water resources will help filter out sediment and contaminants and keep water temperatures cooler.

Reduce Vulnerability

A forest's vulnerability is its susceptibility to undesired change from stressors. Forests with high complexity are more likely to withstand stressors and recover from disturbances. Complex forests have a diversity of tree species, including trees that are likely to do well in future climate conditions (see Figure 4-5 and 4-6), a variety of tree sizes, ages, and tree arrangements, and enough standing deadwood and logs on the ground. Forests with existing high complexity can be monitored over time for signs of vulnerability. Forests that are lacking in high forest complexity in one or more areas can become more resilient through forest stewardship activities such as creating openings of different sizes to promote regeneration of well-adapted species, thinning of forests to promote growth, and selectively felling trees to increase the amount of deadwood on the ground.

Provide Refuge

Conserving areas of diverse topography, geology, and local connectivity to provide options for threatened and endangered species can provide refuge for these species as the climate changes. Forested areas that contain endangered and threatened species and the conditions that sustain them should be prioritized for conservation, and may be most appropriate to designate as forest reserves where a passive management approach is taken. Natural communities in Warwick that support rare, endangered, and threatened species are identified in BioMap2 and discussed more in Section G. Fisheries and Wildlife.

Figure 4-5: Northern and Southern New England Ecoregions

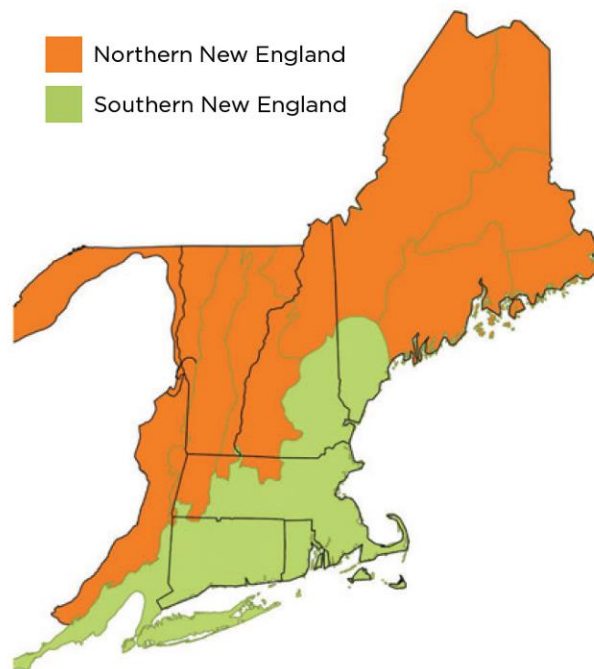


Figure 4-5 displays the forest ecoregions used in Figure 4-6 on the following page. Warwick is located in the Northern New England ecoregion, on the border of the Southern New England ecoregion. Source: Increasing Forest Resiliency for an Uncertain Future. Catanzaro, Paul, Anthony D'Amato, and Emily Silver Huff. 2016. <https://masswoods.org/sites/masswoods.net/files/Forest-Resiliency.pdf>.

Figure 4-6: Predicted Change in Suitable Habitat

The following table provides tree species and predictions of how competitive they will be in the future. The values following each species name indicate whether species-suitable habitats will increase (+), decrease (–), or stay the same (●) under projected climate change.

Northern New England (Ecological subsections M211A, B, C, and D, and M211E and J)			Southern New England (Ecological subsection M221A)		
Tree Species	Low Emissions (PCM B1)	High Emissions (GFDL A1FI)	Tree Species	Low Emissions (PCM B1)	High Emissions (GFDL A1FI)
Balsam Fir	–	–	Balsam Fir	–	–
Black Spruce	–	–	Black Spruce	–	–
Northern White Cedar	–	–	Eastern White Pine	–	–
Paper Birch	–	–	Northern White Cedar	–	–
Red Spruce	–	–	Paper Birch	–	–
Tamarack	–	–	Quaking Aspen	–	–
White Spruce	–	–	Red Spruce	–	–
			White Spruce	–	–
American Beech	●	–			
Quaking Aspen	●	–	Tamarack	–	●
Sugar Maple	●	–			
Yellow Birch	●	–	American Beech	●	–
			Northern Red Oak	●	–
Bear/Scrub Oak	●	●	Red Maple	●	–
Bigtooth Aspen	●	●	Yellow Birch	●	–
Eastern White Pine	●	●			
Red Maple	●	●	Bear/Scrub Oak	●	●
			Black Cherry	●	●
American Basswood	●	+	Sugar Maple	●	●
Bitternut Hickory	●	+			
Black Cherry	●	+	Bigtooth Aspen	+	●
			Pitch Pine	+	●
Pitch Pine	+	●			
			American Basswood	●	+
Black Birch	+	+			
Black Oak	+	+	Bitternut Hickory	+	+
Chestnut Oak	+	+	Black Oak	+	+
Northern Red Oak	+	+	Chestnut Oak	+	+
Shagbark Hickory	+	+	Shagbark Hickory	+	+
White Oak	+	+	White Oak	+	+
Threatened by Current Forest Health Issues (Do not target)			Threatened by Current Forest Health Issues (Do not target)		
Black Ash	–	–	Black Ash	–	–
Eastern Hemlock	●	●	Eastern Hemlock	●	●
White Ash	●	●	White Ash	●	●

Figure 4-6 displays the projected changes in tree species habitat (increase, decrease, or stay the same) under two future GHG emissions scenarios for each region. Source: Increasing Forest Resiliency for an Uncertain Future. Catanzaro, Paul, Anthony D'Amato, and Emily Silver Huff. 2016.

<https://masswoods.org/sites/masswoods.net/files/Forest-Resiliency.pdf>

F.2 Agricultural Land

Prime farmland soils in Warwick comprises 31 percent of the Town's total land area, but only about 6% of these areas are used for cropland or pasture. Approximately 619 acres in Warwick are farmed as open fields,²⁹ which are a rare and valued aspect of the landscape resources in Town. Agricultural land can be found in the following areas: the valley south of Moores Pond, along Route 78 at and south of the village, along Shepardson Road, east and north of Wheelers Pond, Mayo's Corner area, along Chase Hill Road, northwest of Mallard Hill, along the north end of Old Winchester Road, and along Route 78 just south of the New Hampshire border.

At present there is only one dairy farm, the 198-acre Chase Hill Farm, which is currently operated for commercial purposes, and a sheep farm on Route 78, east of Wheeler Pond. Hettie Belle Farm raises grass-fed beef and lamb and pastured pork, chicken, duck, and turkeys on leased land just north of the center of town. There are many smaller-scale producers of farm products throughout town as well, and the Warwick Town Hall has a commercial kitchen available for use by residents for small-scale food processing. Agricultural land in Warwick is valued for its contrast to the predominance of forestland, providing scenic landscapes and open vistas. Recreational opportunities on these lands include cross-country skiing, snowshoeing, snowmobiling, and sledding.

In 2016, Mount Grace Land Conservation Trust published *Food and Farming in the Quabbin Region: A community Food System Assessment of Athol, Barre, Hardwick, Orange, Petersham, and Warwick*. The study notes:

Many of the active farms that remain are similar to those of 200 years ago; most are relatively small but diverse, with a focus on beef and dairy production and limited fruit and vegetable production. Many farmers do not own the land they farm or have not identified successors, and the future of those farms is therefore uncertain. At the same time, new and beginning farmers struggle to find and afford farmland and housing. Two-thirds of the open farmland (approximately 5,300 acres of farm fields) in our region is still unprotected and threatened by development. (page 13)

Hay, beef, dairy, poultry, and pork are identified as the most commonly produced farm products in the north and east Quabbin region. The report also notes that farmland in the region is particularly vulnerable to development, since it is often the flattest and most open land available in the heavily wooded towns. The report estimates that 365 acres, or 59%, of Warwick's open farm fields are not protected from development. A separate farmland inventory for Warwick completed by MGCLT as part of the regional report notes "there is potential to produce even more food and fodder [in Warwick] by protecting the farmland that exists and selectively reclaiming underutilized or former farm fields."³⁰

The potential to produce more in Warwick, coupled with the challenge for beginning farmers to find land, could complement one another through leasing of farmland. Non-farming landowners, particularly those with land containing prime farmland soils, could lease or sell some of their

²⁹ "Warwick Farmland Inventory," prepared for the Town of Warwick in 2016 by Mount Grace Land Conservation Trust; and MassGIS 2005 land use data.

³⁰ Ibid, page 1.

land to farmers to use for growing hay or other products. This is already a common situation for farmers in the region. Hettie Belle Farm in Warwick is one example of a family farm that leases most of its pasture land from surrounding neighbors. This arrangement helps keep the farm fields open and allows the farmers to produce more than they otherwise could. The Warwick Agricultural Commission could work with MGLCT to identify potential landowners who might be interested in leasing their land to beginning farmers, and assist with developing lease agreements for that purpose.

Land protection is another way to ensure farmland remains available and affordable to future farmers. Mount Grace Land Conservation Trust has worked to permanently protect farms from development. In 2001, MGCLT protected 198 acres at Chase Hill Farm in Warwick. In recent years the farm changed ownership, but continues to produce pasture-raised meat and dairy products.

The Agricultural Preservation Restriction (APR) Program is one method for permanently protecting farmland. It is a voluntary program that provides a non-development alternative to farmers and other owners of "prime" and "state important" agricultural land. The program offers to pay farmland owners the difference between the "fair market value" and the "agricultural value" of their farmland in exchange for a permanent deed restriction, which restricts any use of the property that will have a negative impact on its agricultural viability.³¹ The APR program requires a local match for the program that can come from any combination of three sources: the municipality, a non-governmental organization such as a land trust, and from a bargain sale conducted by the landowner. The local match requirement is 20 percent, however this percent is reduced if the town has implemented certain policies, including establishing an Agricultural Commission and adopting a Right-to-Farm bylaw.

Warwick has an Agricultural Commission, a Right-to-Farm bylaw in place, and Right-to-Farm signage. Agricultural Commissions advocate for farmers, farm businesses, and farm interests in town, and can help work with other boards and committees on farm related issues or concerns. A Right-to-Farm bylaw encourages the pursuit of agriculture, promotes agriculture-based economic opportunities, and protects farmlands within a town by allowing agricultural uses and related activities to function with minimal conflict with abutters and town agencies.

Climate change makes farmland protection even more vital. Locally grown and harvested products allow communities to be more self-sufficient and to contribute to the reduction of pollution and use of fossil fuels associated with industrial agriculture. Purchasing locally grown food and farm products also supports the continued viability of farming in the region, and therefore helps protect farmland from conversion to other uses. Many farmers in Franklin County and the Quabbin region sell their produce locally, either directly on the farm, through farmers markets and community supported agriculture (CSAs), or through stores that are committed to purchasing from local farms.

Recommendations to increase local food production and consumption in the region from the 2016 *Food and Farming in the Quabbin Region* food system assessment include the following:

³¹ Massachusetts Agricultural Preservation Restriction Program: <https://www.mass.gov/service-details/agricultural-preservation-restriction-apr-program-details>

- Conserve the most important and threatened farms in the region
- Support farmland owners with transition planning and connect the next generation of farmers with “exiting” farmers or non-farming landowners
- Utilize community kitchens, such as the Warwick Town Hall, for small batches of value-added products
- Support “buy-local” programs and campaigns that help market local products to consumers
- Improve connections between local farms and small retail markets, restaurants, and other outlets and support smaller markets that source local food
- Strengthen connections between farmers and institutional buyers like schools

F.3 Wetland Vegetation

The forested deciduous swamp is the predominant wetland type in the Town of Warwick. These areas are essentially red maple swamps. Also common in Warwick are mixed deciduous swamps, which include Eastern hemlock (*Tsuga canadensis*) and White Pine (*Pinus strobus*). Wetland understory shrubs are common in these swamps and can include mountain holly (*Nemopanthus mucronatus*), highbush blueberry (*Vaccinium corymbosum*), and winterberry (*Ilex verticillata*). Herbaceous vegetation such as sedges (*Carex spp.*), ferns, false hellebore (*Veratrum viride*) and skunk cabbage (*Symplocarpus foetidus*) are also found. (USDA; 1992). Spruce-fir boreal swamps are present but not common, typically consisting of the red spruce variant which lacks balsam fir. There are also a few large black gum (*Nyssa sylvatica*) swamps as well as scattered black ash (*Fraxinus nigra*) swamps.

According to BioMap2, Warwick has several good examples of rare wetland types. These include Kettle Hole Level Bogs, Acidic Graminoid Fens, and Black Gum Swamps.³² Acidic Graminoid Fens most often occur along pond margins, slow-moving streams, and along the outlet streams of stream headwater peat lands. They are considered the most species-rich of acidic peat land communities. They have similar species to acidic shrub fens, but graminoid and herbaceous species are dominant. Typical graminoids include beaked sedge (*Carex utriculata*), slender woolly-fruited sedge (*Carex lasiocarpa* var. *americana*), white beak-sedge (*Rhynchospora alba*), twig-sedge (*Cladium mariscoides*), and pond shore-rush (*Juncus pelocarpus*). Associated herbaceous species are St. John's Wort (*Hypericum spp.*), pickerel weed (*Pontederia cordata*) and rose pogonia (*Pogonia ophioglossoides*). Large cranberry can also be abundant. There are two examples of Acidic Graminoid Fens within Warwick’s BioMap2 Core Habitat areas. One is a small example in good condition despite the presence of an invasive exotic species. The other example in town is in relatively pristine condition with good species and structural diversity and an adequate natural vegetation buffer.

Black Gum Swamps are deciduous swamp forest characterized by black gum (*Nyssa sylvatica*) and occur on mineral, shallow muck or peat soils that are either seasonally flooded or saturated. In Warwick, these areas have peat moss covering the ground. These swamps occur below 1000

³² Warwick’s BioMap2 Core Habitat areas are shown on the Wildlife Habitat map at the end of Section 4, and can be viewed online using NHESP’s mapping tool: <http://maps.massgis.state.ma.us/dfg/biomap2.htm>

feet in elevation, have relatively small watersheds, limited drainage and are usually isolated from perennial streams. They occur in depressions where the water seeps from groundwater, rainwater, or seasonal intermittent streams. They are characterized by hummocks and hollows that are seasonally flooded. A co-dominant species occurring with the black gum is the red maple (*Acer rubrum*). Under the tree canopy, in the shrub layer, Black Gum Swamps usually have winterberry (*Ilex verticillata*), and highbush blueberry (*Vaccinium corymbosum*). Cinnamon fern (*Osmunda cinnamomea*) is the most abundant herbaceous species and is prominent on the hummocks. Sphagnum mosses, primarily *Sphagnum spp.*, carpet the hollows.

Warwick contains an example of Black Gum Swamp within a BioMap2 Core Habitat area. According to BioMap2, this Black Gum Swamp is in excellent condition, with good structural and species diversity, and is well buffered within a naturally vegetated community. The 365-acre Warwick Town Forest is thought to contain the largest population of Black Gum trees in Massachusetts. The Town Forest parcels abut State Forest lands, contributing to a large block of contiguous forest in the southwest section of town. In the past 20 years, private donations and fundraising by the Warwick Open Space Committee made several additions to the Town Forest possible. Most recently, in 2017 the Town received \$100,000 through the Environmental Bond Bill to secure approximately 88 additional acres.³³

According to BioMap2, Kettlehole Level Bogs are acidic dwarf-shrub peatlands with little water input or outflow that form in circular depressions left by melting ice blocks in sandy glacial outwash. The vegetation in Kettlehole Level Bogs usually grows in rings. Within Warwick's BioMap2 Core Habitat areas, there are several small examples of Kettlehole Level Bogs. These bogs are in good condition and well-buffered by natural vegetation.

F.4 Rare, Threatened and Endangered Species

The Natural Heritage and Endangered Species Program (NHESP) of the Massachusetts Division of Fisheries and Wildlife has designated several "Priority Habitat" areas in the Town of Warwick. A Priority Habitat is an area where plant and animal populations protected by the Massachusetts Endangered Species Act Regulations (MESA; 321 CMR 10.00) may occur. Rare species habitat is located in the following areas in Warwick, and is also shown on the Plant and Wildlife Habitat Map:

- An area surrounding Moores Pond, Harris Swamp, and along Darling Brook in the southwest section of town;
- An area surrounding Williams Meadow, Hodge Brook, Gale Pond, Gale Brook, and Hubbards Pond in the central section of town; and
- Areas within Warwick State Forest in the western section of town.

The 14th edition of the Natural Heritage Atlas (effective August 1, 2017) displays the boundaries of the MESA-protected Priority Habitats and Estimated Habitats throughout the Commonwealth. Estimated Habitats are a sub-set of the Priority Habitats, and are based on the geographical

³³ "Warwick Town Forest adds 88 acres." Ashline, Shelby. *The Recorder*, December 1, 2017,

extent of habitat of state-listed rare wetlands wildlife as codified under the Wetlands Protection Act, which does not protect plants. The 2017 Atlas is the product of a statewide revision of Priority Habitat and Estimated Habitats to reflect the latest state-listed species data, understanding of species biology and habitat requirements, and GIS technology and data.

The Massachusetts Environmental Policy Act (MEPA; M.G.L. c.30, secs. 61-62H and regulations 301 CMR 11.00) provides the public an opportunity to review proposed projects for environmental impacts, including potential impacts to state-listed rare species. Projects resulting in a "take" of state-listed rare species and disturbing two or more acres of Priority Habitat of Rare Species may be required to file an Environmental Notification Form (ENF) with the MEPA office (301 CMR 11.03(2)).

NHESP has identified 258 native plant species as rare in the Commonwealth, and a number of rare plants have been documented in the Town of Warwick. These plants occur in some of the Priority Habitats identified above. Plants (and animals) listed as *endangered* are at risk of extinction (total disappearance) or extirpation (disappearance of a distinct interbreeding population in a particular area). *Threatened* species are likely to become endangered in the foreseeable future. *Species of special concern* have been documented to have suffered a decline that could result in their becoming threatened, or occur in very small numbers and/or have very specialized habitat, the loss of which could result in their becoming threatened (NHESP, 2017). Rare plant species in the Town of Warwick are listed in Table 4-2.

Table 4-2: Rare Plant Species in Warwick

Taxonomic Group	Scientific Name	Common Name	MESA Status	Most Recent Observation
Vascular Plant	<i>Adlumia fungosa</i>	Climbing Fumitory	SC	2012
Vascular Plant	<i>Hypericum ascyron</i>	Giant St. John's-wort	E	2000
Vascular Plant	<i>Linnaea borealis ssp. Americana</i>	American Twinflower	SC	2014
Vascular Plant	<i>Mimulus moschatus</i>	Muskflower	T	1909
Vascular Plant	<i>Potamogeton confervoides</i>	Algae-like Pondweed	T	2015
Vascular Plant	<i>Ranunculus pensylvanicus</i>	Bristly Buttercup	SC	2017
Vascular Plant	<i>Scheuchzeria palustris</i>	Pod-grass	E	2014
Vascular Plant	<i>Scirpus ancistrochaetus</i>	Northeastern Bulrush	E	2016
Vascular Plant	<i>Utricularia resupinata</i>	Resupinate Bladderwort	T	2015

Source: Massachusetts Natural Heritage and Endangered Species Program, Rare Species by Town Viewer: <https://www.mass.gov/service-details/rare-species-by-town-viewer>.

Any MESA listed species with a most recent observation date within the past 25 years is considered to be current. Older dates may be species that have not been recently inventoried, or they may be lost from Warwick as land use has changed and water quality has changed. Fact

Sheets describing many of the MESA listed species and their habitats are available from the state's Natural Heritage and Endangered Species Program (NHESP) website.³⁴

F.5 Public Shade Trees, Stone Walls and Rural Roads

Every survey of town residents for over 20 years has documented that maintaining the rural character of Warwick is a top priority. Recent and past Open Space and Recreation Surveys documented many of the components of the rural character, which included, among other things, Warwick's rural dirt roads, shade trees and stone walls. In the early 1970s, increased use of salt on the roads caused some wells to become contaminated and also caused the decline and death of many majestic sugar maple trees. These trees had been treasured for shade and sugar since they were planted in the early 1800s. Currently, the Town's policy is to use salt only on paved roads, and sand only on gravel and dirt roads. By not mixing salt and sand, the Town now uses less salt and less sand on the roads. In addition, the village center is subject to a low salt/no sand policy. Since the 1970s, the loss of roadside shade trees has been minimal, and is typically due to safety or maintenance concerns from the Highway Department or utility company. The Town Forest Committee may want to consider developing a replanting strategy for roadside trees in areas where trees have been lost over the years, and could pursue State grants available for public shade tree planting.

In the recent past there was a problem with over tapping sugar maples along the roads and in the town cemetery. As a result of these problems, the Tree Warden proposed to the Annual Town Meeting prohibiting the tapping of town shade trees and the trees in the cemetery. After much heated discussion the measure was adopted.

The regional school is in Northfield and in the early 1970s the road leading to Northfield was difficult to drive in winter. It was narrow and curvy as it followed a stream through dense hemlock stands. The dense hemlock stands prevented sun from getting to the road so it was always icy in winter. When state money became available, the town meeting voted to straighten and widen the road. The road is now wider, straighter, of more uniform grade and the shoulders are wider than before, but the town also lost one of the most beautiful roads in all of Massachusetts. While it is difficult to balance the safety of students against rural beauty, a consensus developed that in town that a lot was lost when the road was improved. As a result, town meeting voted to designate all roads in town, except State Route 78, as Scenic Roads. Now a public hearing is required whenever a shade tree is cut or whenever someone wants to remove part of a stone wall for a driveway cut. The Planning Board holds the hearings, and if it is a shade tree there is a joint hearing with the Tree Warden.

Warwick's rural roads are special. The town has only one sidewalk along the town common, and the only curbing is around the town hall. Some years ago over half of the town road mileage was dirt, and there are still a lot of miles of dirt roads, which are treasured as part of the town's rural character. For many years Warwick refused to accept state highway money that required the widening of roads to meet "standards." The rules have changed and it is now possible to get state road aide without having to cut down the shade trees and widen the road.

³⁴ <https://www.mass.gov/service-details/list-of-plants>.

At the operational level, the Highway Department is responsible for the shade trees that are “down,” while the Tree Warden is responsible for the trees that are “standing.” The Planning Board has deliberately not made any rules defining a “shade tree.” This allows operational flexibility to the Highway Department as it does its annual winter brush clearing along the roads. The trees within the town right of way are the responsibility of the town, and require a public hearing prior to removal. Warwick’s local custom is to leave the firewood for the abutter and only the smaller branches and softwoods are chipped and removed. Warwick has a lot of state forest land and when trees are cut along roads where the abutter is the State, the firewood is left alongside the road. It doesn’t last long.

F.6 Analysis

Plants and animals are both critical, inter-related components of the ecosystem in Warwick. Plants convert solar energy into food. This food supports all animal life. Plants cycle energy through the ecosystem by decaying, by removing carbon, and by shedding oxygen. Plants help moderate temperatures. Plants act as shelter and as food for herbivores, omnivores, and carnivores.

Fields, a maintained stage of human-caused vegetation, are rare in Warwick and thus valuable. Forests on the other hand are plentiful and therefore may appear common. However, they should not be taken for granted because of what forests do: they protect aquifers, first and second order streams, and edge and interior habitats; they clean the air and cleanse the water; and, they can provide us with materials, food, and medicines to support our human community. Forested wetlands are unique sites where the greatest level of biodiversity occurs. In summary, all of Warwick’s vegetation within its fields, forests, and wetlands together can be considered part of an extensive life support system for the diversity of life.

G. FISHERIES AND WILDLIFE

Warwick’s forests, rivers, wetlands and open farmland provide habitat for a variety of common and rare wildlife species. This section discusses wildlife species and their habitats from the perspective of natural communities, individual species, and patterns of wildlife distribution and movement across the landscape.

G.1 Biodiversity in Warwick

In 2012, 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. On the statewide level, *BioMap2* helps to guide strategic conservation to protect those areas that are most critical to the long-term survival and persistence of rare and other native species and their related habitats and ecosystems. On the local level,

Warwick can use this information to better understand where the Town’s ecosystems and habitats fit into the bigger picture, and to prioritize land protection efforts.

BioMap 2 divides the state into thirteen distinct ecological regions based on geology, soils and plant and animal communities. Warwick lies within the Worcester plateau, a region distinguished by the hilly areas of the central uplands of Massachusetts, dominated by transition hardwood forest and forested wetlands.

The project maps “Core Habitats” and “Critical Natural Landscapes” that support the long-term persistence of rare and native species. The *BioMap2* project identified 8,625 acres of Core Habitat and 18,791 acres of Critical Natural Landscapes in Warwick that currently support a broad range of wildlife and plant species. The two types of landscapes overlap in many areas, and are shown on the Plant and Wildlife Habitat Map at the end of Section 4. According to the Warwick BioMap2 town report, an estimated 71% of Core Habitat area, and 62% of Critical Natural Landscape in Warwick is permanently protected from development (Table 4-3).

Table 4-3: BioMap2 Core Habitat and Critical Natural Landscape in Warwick

Warwick BioMap2	Total Acres	Percent of Town	BioMap2 Acres Protected
Core Habitat	8,625	36%	71%
Critical Natural Landscape	18,791	78%	62%

Source: BioMap2 Warwick town report, 2012.

http://maps.massgis.state.ma.us/dfg/biomap/pdf/town_core/Warwick.pdf

Warwick contains a large amount of upland and bottomland wildlife habitat that support rare and common species. The forests of the Town consist of large unbroken tracts of dense forest that allow for good species movement within Warwick and the surrounding region. The Town still has a number of maintained fields and pasture areas, which provide an important ecological function for the maintenance of open land and edge species (those species that require this transitional zone for daily activities.) A general description of wildlife habitats and an inventory of wildlife observed in Warwick (both common species and rare or endangered species) is included in the Appendix at the end of Section 4.

Warwick’s *BioMap2* Core Habitat and Critical Natural Landscapes support 13 Species of Conservation Concern (Table 4-4). These include species listed under the Massachusetts Endangered Species Act (MESA), as well as species identified in the State Wildlife Action Plan (SWAP) that are most in need of conservation within Massachusetts but that are not MESA-listed species. MESA-listed species fall into three categories:

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

Threatened – species that are more likely to become Endangered in Massachusetts in the foreseeable future throughout all or a significant portion of their range;

Special Concern – species that 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.³⁵

Table 4-4: BioMap2 Species of Conservation Concern Documented within Warwick’s Core Habitat and Critical Natural Landscapes

Taxonomic Group & Common Name	Scientific Name	Status
Mussels		
Creeper	<i>Strophitus undulatus</i>	Special Concern
Insects		
Dragonflies		
Spatterdock Darner	<i>Rhionaeschna mutata</i>	Special Concern
Ski-tipped Emerald	<i>Somatochlora elongata</i>	Special Concern
Amphibians		
Blue-spotted Salamander	<i>Ambystoma laterale</i>	Special Concern
Four-toed Salamander	<i>Hemidactylium scutatum</i>	Non-listed SWAP
Reptiles		
Wood Turtle	<i>Glyptemys insculpta</i>	Special Concern
Smooth Green Snake	<i>Opheodrys vernalis</i>	Non-listed SWAP
Spotted Turtle	<i>Clemmys guttata</i>	Non-listed SWAP
Birds		
American Bittern	<i>Botaurus lentiginosus</i>	Endangered
Plants		
Giant St. John’s-wort	<i>Hypericum ascyron</i>	Endangered
Algae-like Pondweed	<i>Potamogeton confervoides</i>	Threatened

SWAP = species of interest in the *State Wildlife Action Plan*.

Source: BioMap2 Warwick town report, 2012.

http://maps.massgis.state.ma.us/dfg/biomap/pdf/town_core/Warwick.pdf

All of the currently known rare animal species in Warwick are associated with water and wetlands, including: swamps, bogs, vernal pools, rivers and lakes. Rare species of freshwater mussels, damselflies and dragonflies occur in the rivers and streams. Both groups of species are good indicators of water quality. Although the various rare turtles and salamanders in Warwick have varied habitat requirements, they all require wetlands and adjoining forests, which are found in BioMap2 Core Habitat along the Moss, Darling and Orcutt Brooks, their tributaries, and other locations in town. In addition, the state’s Division of Fisheries and Wildlife has identified streams throughout Massachusetts that provide important habitat for native cold water fisheries (CFR, Coldwater Fisheries Resources). In Warwick, these CFRs include Mill, Kidder, and Tully Brooks (see Section E. Water Resources for a full account of CFRs in Warwick). Buffers along these streams that maintain shade and filter inflowing sediments are important for maintaining their water – and habitat – quality. Culverts in the streams should be maintained or upgraded to

³⁵ BioMap2 Warwick town report, 2012. http://maps.massgis.state.ma.us/dfg/biomap/pdf/town_core/Warwick.pdf

allow movement of fish, turtles, and other aquatic and terrestrial species, while providing for greater resiliency to an increase in more intense flooding as the climate changes.

Warwick has records of species in the suite of ‘secretive’ or inconspicuous marsh birds that include the American Bittern (Endangered) that nest and often forage in dense marshes. The shrub fen and marsh habitat of these species is also used by turtles, dragonflies, and a large variety of other species.

In a survey for uncommon and exemplary natural communities during field work for the initial BioMap report, a large number of northern types of natural communities were identified in Warwick. Most are uncommon in much of the state, being more typical of cooler areas. Bogs, Fens, and Spruce–Fir Boreal Swamps are peat lands that need not only cool conditions, but require high water quality and maintained water quantity. Alterations such as harvesting around bogs and forested wetlands and/or changes in hydrologic cycles may lead to the deterioration of these natural communities and the subsequent loss of known habitat for uncommon species like a rare dragonfly that breeds in bogs and the recently delisted Four-toed Salamander. These natural communities are particularly vulnerable to rising temperatures and altered precipitation patterns due to climate change.

Large, unfragmented forests that provide habitat and buffer wetlands and streams, and patches of different upland conditions like cliffs, are important for maintaining the communities and habitats and allowing for natural mosaics of conditions that support a variety of rare and common species. One example of such a mosaic of communities and habitats for rare species is found in a BioMap2 Core Habitat area in Warwick where a large, excellent example of the not-uncommon Northern Hardwoods – Hemlock – White Pine Forest occurs – much of it on land that was forested in the 1830s (described below).

One state protected rare plant, Giant Saint John’s Wort (Endangered), is currently known to exist in Warwick. It is generally found in wet meadows or thickets near streams. Musk flower (Endangered), is known only historically from Warwick. Its habitat needs are somewhat similar to the Giant Saint John’s Wort – cool, wet soil along water courses. However, Musk flower doesn’t compete well with shrubs or invasive exotic plants and may have been lost from Warwick as natural succession occurred.

Protecting areas of the NHESP Priority Habitats and the BioMap2 Core Habitat areas that have not yet been protected would support habitat of rare, and also common, species and enhance their viability. Many of the areas of conservation land in Warwick are in BioMap2 Core Habitat areas. Protecting areas adjacent to existing conservation land limits fragmentation and maintains a variety of habitats.

Warwick 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 on the Plant and Wildlife Habitat 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 had mandated that the Towns make.³⁶ Warwick's map 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 may not have ever been tilled. 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. In addition, a variety of species of wildflowers are more common in untilled forests than previously tilled lands. Many of the forested areas identified in 1830 and 1999 are part of BioMap2 Core Habitat and Critical Natural Landscape areas, and are good targets for conservation to help maintain the biodiversity of the town and region.

Large unfragmented conservation land provides the best opportunities to maintain populations of species and limit species loss from the Town. Land protection that ties in with open space in other municipalities, and other protected open space, public or private is one way to provide important large areas of biodiversity protection. For example, some of the 1830s forest is in conservation land, but there are areas adjacent to or near the protected open space that might be targeted as important areas for biodiversity protection.

G.2 Vernal Pools

Vernal pools are temporary bodies of freshwater that provide critical habitat for many vertebrate and invertebrate wildlife species. Vernal pools are found across the landscape; anywhere that small woodland depressions, swales or kettle holes collect spring runoff or intercept seasonally high groundwater tables. Certified Vernal Pools, those that meet the criteria established by the Natural Heritage and Endangered Species Program, are protected to some extent by the Massachusetts Wetlands Protection Act and also are protected by additional state and federal regulations. The Town of Warwick has an undetermined number of vernal pools. Warwick currently has over 50 Certified Vernal Pools, and efforts are currently underway to certify others that have been identified from aerial photographs and need to be verified on the ground.

Since the last update to the Warwick Open Space and Recreation Plan, at least 30 vernal pools have been certified by the Warwick Conservation Commission. In addition, the Commission holds an annual vernal pool day in the spring to help educate residents about vernal pools. Commissioners lead a hike to a vernal pool in town and certify it together. Certifying the vernal pools that have not been examined would provide additional protection to these wetlands and the species that use them. Clusters of vernal pools provide extra habitat value for the species that use them since each pool is somewhat different and provides alternate habitats in different years and seasons. Any such lands already protected are good sites for biodiversity and good cores for larger properties.

³⁶ More information about the maps, and access to the digitized versions, can be found here: <http://harvardforest.fas.harvard.edu:8080/exist/apps/datasets/showData.html?id=hf122>

G.3 Rare, Threatened and Endangered Species

NHESP has identified 169 species of animals in Massachusetts that are protected under the Massachusetts Endangered Species Act (MESA). Table 4-5 displays MESA-protected species that have been observed in Warwick, and that may be found in the NHESP Priority Habitat areas identified in the 14th edition of the Natural Heritage Atlas (effective August 1, 2017). Animals listed as *endangered* are at risk of extinction (total disappearance) or extirpation (disappearance of a distinct interbreeding population in a particular area). *Threatened* species are likely to become endangered in the foreseeable future. *Species of special concern* have been documented to have suffered a decline that could result in their becoming threatened, or occur in very small numbers and/or have very specialized habitat, the loss of which could result in their becoming threatened (NHESP, 2017).

Table 4-5: Animals listed as Endangered, Threatened, or Species of Special Concern Identified in Warwick

Taxonomic Group	Scientific Name	Common Name	MESA Status	Most Recent Observation
Amphibian	<i>Ambystoma jeffersonianum</i>	Jefferson Salamander	SC	2016
Bird	<i>Botaurus lentiginosus</i>	American Bittern	E	2016
Dragonfly/Damselfly	<i>Somatochlora elongata</i>	Ski-tipped Emerald	SC	2002
Mammal	<i>Sorex palustris</i>	Water Shrew	SC	Historic
Mussel	<i>Strophitus undulatus</i>	Creeper	SC	1997
Reptile	<i>Glyptemys insculpta</i>	Wood Turtle	SC	2012

SC = Special Concern; E = Endangered.

Source: Massachusetts Natural Heritage and Endangered Species Program, Rare Species by Town Viewer:

<https://www.mass.gov/service-details/rare-species-by-town-viewer>.

Where BioMap2 is a planning and conservation tool with no regulatory significance, State-listed rare species and Priority Habitat areas are regulated by the Massachusetts Endangered Species Act. Projects resulting in a "take" of state-listed rare species and disturbing two or more acres of Priority Habitat of Rare Species may be required to file an Environmental Notification Form (ENF) with the State.

G.4 Analysis

The Town of Warwick is fortunate for having permanently protected open space areas much greater than fifty acres in size that support habitat for a wide range of species, including a number of rare, threatened, and endangered species. State conservation agencies and private land trusts have been focusing attention on a large regional corridor of protected open space that already encompasses portions of Warwick. This regional greenway is made up of state forests and privately owned lands from the New Hampshire border through Warwick to Erving and further south. One branch of the greenway skirts along the western flank of Orange to New Salem to the Quabbin. The western branch moves south through Erving to Wendell, then to Montague and finally connects to the Connecticut River Greenway.

Warwick will continue to focus land protection efforts on the gaps between large protected forested patches and the BioMap2 Core Habitat Areas to conserve wildlife habitat and opportunities for recreational activities (like hunting and backpacking) that require vast undeveloped landscapes. Connecting Core Habitat areas with protected corridors is also critical to support the migration of species to more suitable habitat as the climate changes. Finally, identifying and conserving the unique natural communities and microclimates in Warwick that support rare and threatened species will help provide refuge for these species that may otherwise be lost from the landscape.

H. SCENIC RESOURCES AND UNIQUE ENVIRONMENTS

This section identifies the scenic resources and unique environments that most Warwick residents would agree represent the essence of Warwick's character.

In many ways the history of Warwick – how people came to settle the land, used its resources, and enjoyed its forests, streams, and lakes – can be seen in the landscapes that have retained a sense of the past. Often the most scenic views include old farm buildings, fields cleared long ago, and undeveloped hillsides and mountains. Historic homes, meeting halls and churches provide us with a sense of our culture and the work of our ancestors.

The unique environments in Warwick play a very important role in providing residents with a sense of place. Brooks, mountains, wetlands, and the Town center provide markers on the landscape within which we navigate our lives.

There are many examples in Warwick where a scenic landscape is also important because of its location relative to other landscape features. The purpose for inventorying the scenic resources and unique natural environments in Warwick is to provide a basis for prioritizing resource protection efforts. For this reason the following section includes information about the different values associated with each scenic resource and natural environment and also demonstrates the areas where there are multiple values represented in one landscape. Those landscapes that contain, for example, scenic, wildlife, and cultural values may be seen as having a higher priority for protection than a landscape that contains only one value. These documented resources include historic landscapes and special places.³⁷

³⁷ This inventory is based on a formal landscape survey done in 1992. The 1992 Franklin County Rural Historic Landscape Preservation Plan Report was created by the Franklin Regional Council of Governments. It describes the status of historic landscapes in the region, the historic context that was used in its determination, and the methodology used in rural historic landscape reconnaissance. It distinguishes between the types of landscapes assessed (*agricultural, community development, recreational, conservation, industrial, transportation, scientific, religious, and engineering*), identifies in general terms the locations of rural historic landscapes in each town, and provides examples of direct and indirect preservation strategies. This methodology for identifying significant historical landscapes was based on the National Park Service criteria that included the area of significance, period of significance, and historical integrity. The National Park Service classifies landscapes into four different categories: landscapes that reflect major patterns of a region's history (e.g. agricultural landscapes), landscapes that are associated with historically significant individuals (e.g. institutional grounds and buildings), landscapes that are important due to their design or physical characteristics (e.g. an 18th Century Colonial Period Connecticut Valley rural farm), and landscapes that yield or have the potential of yielding significant information on pre-history or history (e.g. a native American encampment site).

Table 4-1 is a partial listing of scenic resources and unique environments in Warwick. This table also includes information on the ecological/geological, recreational, and historical values of these resources and their level of protection from development. In the far right column of Table 4-1, the landscape's protection status is estimated. For the purposes of this Open Space and Recreation Plan, a landscape is defined as a land area with a particular land use pattern (farmland), or a physiological landform (monadnock) distinguishable from adjoining areas. Often ownership patterns do not coincide with the boundaries of a landscape. A ridgeline may have portions of it protected while the rest is unprotected. Landscapes that contain parcels in the Chapter 61, 61A, or 61B programs are important because the Town has the right of first refusal to purchase these properties for 120 days from the point at which the owner has received a purchase and sale agreement. This right may be passed onto a third party, such as a conservation land trust.

The resources listed in Table 4-1 are shown on the Scenic Resources and Unique Environments map along with over 50 resource areas (Ponds and Lakes; Wetlands; Recreation Areas; and Historical Areas), which were added to the map during previous updates to the Open Space and Recreation Plan.³⁸ The text that follows the table addresses some of the common themes associated with the greatest concentration of values as displayed in both the map and the table.

Table 4-1: Significant Scenic, Ecological, Recreational and Historic Landscapes and Environments in Warwick

MAP #	SCENIC RESOURCE	ECOLOGICAL/ GEOLOGICAL RESOURCE	RECREATIONAL VALUE ³⁹	HISTORICAL VALUE	PROTECTION STATUS
<i>Stream Corridors</i>					
	Mountain Brook	BioMap2 Core Wildlife Habitat; Wildlife Habitat LOW In areas due to proximity to Route 78 and siltation problems	MED picnic area in transition as new forest grows to replace diseased pines	Cellar hole near stream	Mostly protected within Mt. Grace State Forest
	Darling Brook	BioMap2 Core Wildlife Habitat	LOW/MED fishing	Mill Sites	½ Protected within Warwick State Forest (WSF)
	Moss Brook	BioMap2 Core Wildlife Habitat	HIGH fishing	Mill Dam	Protected by WSF
	Rum Brook	BioMap2 Core Wildlife Habitat	Trail Access for fishing and cross country skiing MED	Mill/Dam Sites	Unprotected
	Black Brook	BioMap2 Core Wildlife Habitat	HIGH	Sites of Warwick's First mill and dams (Ayer's Mill, 1765)	½ Protected by Iverson MGLCT and WSF
	Gale Brook	Wildlife Habitat	LOW Access is problem Potentially HIGH – Beautiful	Site of Gale Grist Mill, Saw Mill, Electric Generation	1/2 MGLCT & WSF

³⁸ Dave Shepardson, a member of the Open Space Plan Update Committee, spent an incredible amount of time updating the 2002 Scenic Resources and Unique Environments Map from Warwick's OSRP. Due to lack of funding and time constraints, Table 4-1 could not be completely updated with detailed information for each resource that Dave identified, but the resources are listed and shown on the map. Table 4-1 was partially updated and work will continue on this table as well as the map.

³⁹ Privately owned sites listed in the table may not be open to the public. It is beyond the scope of this report to identify and list whether privately owned parcels are posted or not.

MAP #	SCENIC RESOURCE	ECOLOGICAL/ GEOLOGICAL RESOURCE	RECREATIONAL VALUE ³⁹	HISTORICAL VALUE	PROTECTION STATUS
	Orcutt Brook	Wildlife Habitat	HIGH Stocked	Multiple mill dams	Unprotected
	Tully Brook, West Branch	BioMap2 Core Wildlife Habitat	HIGH Great Trout Stream	Mill dam site	Mostly Protected by WSF
	Mill Brook	BioMap2 Core Wildlife Habitat: large wetland system includes Stevens Swamp, has/ native brook trout	HIGH Great Trout Stream	Several Mill Sites	Protected in part by WSF
	Hodge Brook	Wildlife Habitat	HIGH Site of Scenic Devil's Washbowl/Hiking Trail	Saw Mill site	Protected within Iverson and WSF
	Kidder Brook	Wildlife Habitat	Very Scenic Kidder Falls and good access	Posted No Trespassing	Private Owner
	Mirey Brook	Wildlife Habitat	MEDIUM Good Fishing	Mill Dam Sites	Mostly Unprotected
	Lovers Retreat Brook	BioMap2 Core Wildlife Habitat	MEDIUM Good Hiking Good Access	Mill Dam Site	Unprotected
<i>Ponds and Lakes</i>					
1	Bent Pond	BioMap2 Core Wildlife Habitat	LOW	LOW	Unprotected
2	Lily Pond	Wildlife Habitat Kettle hole Bog	LOW		Unprotected
3	Richards Reservoir	BioMap2 Core Wildlife Habitat	HIGH NET Trail runs along west shore	Historical Impoundment	Protected by WSF
4	Richards Mill Pond	Wildlife Habitat	HIGH Hiking and Skating	Historical Impoundment/ Sites of Warwick's First mill (Ayer's Mill, 1765)	Protected by WSF
5	Sheomet Lake	BioMap2 Core Wildlife Habitat	HIGH Fishing Blueberry Picking Skating Swimming	Historical Impoundment, mill site and Fishing Camp	Protected by WSF
6	Hastings Pond	BioMap2 Core Wildlife Habitat	LOW No Access	Great Pond Investigating access options	Unprotected
7	Gale Pond	Wildlife Habitat	MED Public Access Scenic	Historical Impoundment	Protected by WSF
8	Moores Pond	Wildlife Habitat	HIGH Town Beach Skating Trout Ice Fishing	Historical Impoundment dam enhanced Great Pond	Protected Great Pond Status with boat ramp
9	Hubbards Pond	Wildlife Habitat	No easy access	Historical Impound. Near a Significant Historical Conservation/Recreation Landscape	Unprotected
10	Laurel Lake	BioMap2 Core Wildlife Habitat	HIGH Public Access State Park Beach and Camping Programs	Significant Historical Conservation/Recreation Landscape Great Pond	Protected & Managed by DCR
11	Whealers Pond	Wildlife Habitat	LOW No Access	Historical Impoundment (private)	Unprotected
12	Johnsonian Pond	Wildlife Habitat	LOW No Access	Unknown (private)	Unprotected
<i>Wetlands</i>					
13	Bass Swamp	BioMap2 Core Wildlife Habitat	HIGH Bird & Moose Watching	Historical Impoundment	Protected by WSF
14	Cranberry Bog	Wildlife Habitat	Cranberry picking	Unknown	Unprotected

MAP #	SCENIC RESOURCE	ECOLOGICAL/ GEOLOGICAL RESOURCE	RECREATIONAL VALUE ³⁹	HISTORICAL VALUE	PROTECTION STATUS
15	Stevens Swamp	BioMap2 Core Wildlife Habitat	HIGH Kayaking, Canoeing, Hiking Scenic Trail	Historical Impoundment Indian Caves	Protected by WSF
16	Harris Swamp	BioMap2 Core Wildlife Habitat	LOW Difficult Access	Historical Impoundment In 1850s Harris Pond was the biggest water body in Town	Partially protected by WSF (infested with Buckthorn)
17	Black Swamp	BioMap2 Core Wildlife Habitat	LOW	Below Black Swamp are Mill Sites	Protected by WSF
18	Williams Meadow	BioMap2 Core Wildlife Habitat	LOW	Unknown	Temporary Protection
19	Gale Meadow	BioMap2 Core Wildlife Habitat – Specie of Conservation Concern	LOW No Access	Cellar holes	Unprotected
Recreation					
20	Warwick State Forest	BioMap2 Core Wildlife Habitat	HIGH Hiking Horseback riding XC skiing Snowmobiling Hunting NET Trail	Significant Historical Recreation/Conservation Landscape	Protected
21	Mount Grace State Forest	BioMap2 Core Wildlife Habitat	HIGH NET Trail Horseback Riding Snowmobiling	Significant Historical Recreation Landscape Abandoned Observation Tower	Protected
22	Warwick Town Forest	Partial BioMap2 Core Wildlife Habitat Black Gum trees	HIGH: Hiking, Equestrian & Snowmobiling	Red Pine planted by CCC	Limited Protection
23	Erving State Forest (including Laurel Lake)	Partial BioMap2 Core Wildlife Habitat	HIGH Swimming Hiking Kayaking/Canoeing Camping	Significant Historical Recreation/Conservation Landscape	Protected
24, 26	Hockanum Hill Conservation Area	BioMap2 Core Wildlife Habitat	HIGH parking area for overlook, hiking trails, geo-caching sites	Unknown	Protected
25	Darling Brook Trail	BioMap2 Core Wildlife Habitat	HIGH Hiking, Horseback Riding	Unknown	Protected
27	Woodsman Trail	Wildlife Habitat	HIGH	Unknown	Protected
28	New England Scenic Trail (NET)	BioMap2 Core Wildlife Habitat	HIGH	Unknown	Partially Protected
29	Round the Mountain Trail	BioMap2 Core Wildlife Habitat	HIGH	Unknown	Protected
30	Ohlson Field / Mass DCR	BioMap2 Core Wildlife Habitat	HIGH	Unknown	Protected
31	Fellows Memorial Field & Monument	None	HIGH Ballfield	Part of Town Common Honors WWII veteran	Protected
32	Town Beach	Scenic	HIGH Swimming Fishing Boating	Historically used for ice harvesting	Protected
Cemeteries					
33	Warwick Center Cemetery		LOW	Historical Site	Protected
34	Atwood Cemetery		LOW	Historical Site	Protected
35	Rich Cemetery		LOW	Historical Site	Protected
36	Enock Kelton Cemetery		LOW	Historical Site	Protected
37	Moses Kelton Cemetery		LOW	Historical Site	Protected
38	Ward Small Pox Cemetery		LOW	Historical Site	Protected
Historical Areas					
39	CCC Camp off White Road		LOW (no access)	Historical Site	Unprotected

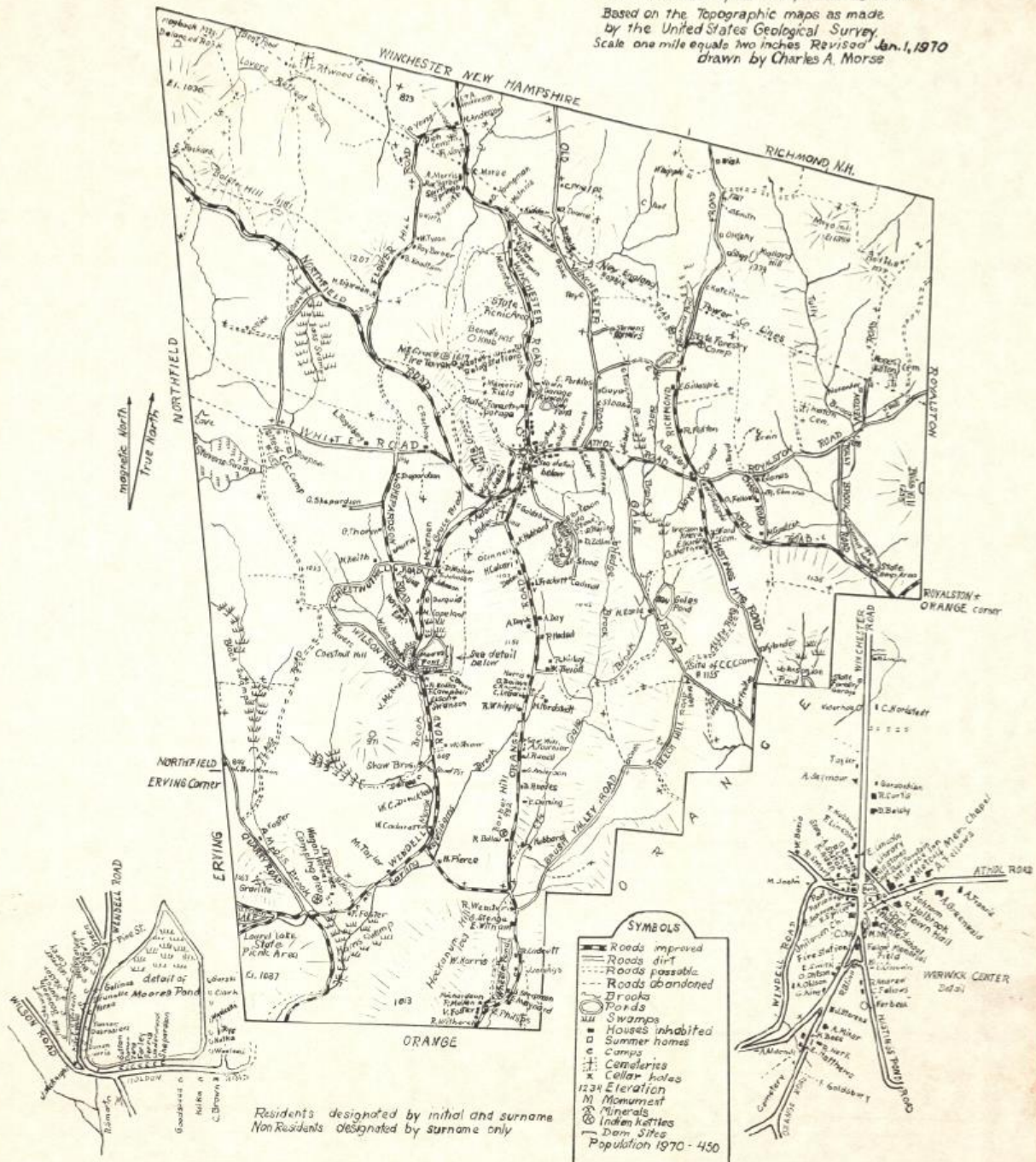
MAP #	SCENIC RESOURCE	ECOLOGICAL/ GEOLOGICAL RESOURCE	RECREATIONAL VALUE ³⁹	HISTORICAL VALUE	PROTECTION STATUS
40	Civilian Conservation Camp 1155	State Forest	LOW	Historical Site	Protected
41	Transient Camp	State Forest	LOW	Historical Site	Protected
42	Millstone Monument & Ball Fountain		LOW	Historical Site	Protected
43	Zylpha Smith Cabin Site	State Forest	LOW	Historical Site	Protected
44	Reverend Hedge House		LOW	Historical Site	Unprotected
45	Reverend Preserved Smith House		LOW	Historical Site	Unprotected
46	First Tavern		LOW	Historical Site	Unprotected
47	Glass Company		LOW	Historical Site	Unprotected
48	Air Observation Post		LOW	Historical Site	Unprotected
49	Veterans Memorial		HIGH	Historical Site	Protected
50	Boot Shop		LOW	Historical Site	Protected
51	Glue Shop		LOW	Historical Site	Unprotected
52	CW Delve Blacksmith Shop		LOW	Historical Site	Unprotected
53	Keith Property		LOW	Historical Site	Unprotected
54	Commune Site		LOW	Historical Site	Unprotected
55	H-Grout	State Forest	LOW	Historical Site	Protected
56	CW Bass Property		LOW	Historical Site	Unprotected
57	Turning Shop		LOW	Historical Site	Unprotected
58	M Williams Clothing Shop		LOW	Historical Site	Unprotected
59	Former Town Farm & Poorhouse		LOW	Historical Site	Unprotected
60	Cider Mill		LOW	Historical Site	Unprotected
61	Atwood Chair Shop		LOW	Historical Site	Unprotected
62	Saw Mill	State Forest	LOW	Historical Site	Protected
63	Bass Stave & Box Mill	State Forest	LOW	Historical Site	Protected
64	NG Stevens Tannery / J Bros Co Sawmill	State Forest	LOW	Historical Site	Protected
65	MN Jillson Grist & Stave Mill		LOW	Historical Site	Unprotected
66	CH / WH Jennings Saw Mill		LOW	Historical Site	Unprotected
67	Russel Tannery		LOW	Historical Site	Unprotected
68	NF Stevens Tannery		LOW	Historical Site	Unprotected
69	Scott & Ayres Sawmill / Grist Mill		LOW	Historical Site	Unprotected
70	White Saw Mill	State Forest	LOW	Historical Site	Protected
71	Gale Grist Mill Saw Mill Electric Site		LOW	Historical Site	Unprotected
72	David Gale Grist Mill	State Forest	LOW	Historical Site	Protected
73	Delvey Mill		LOW	Historical Site	Unprotected
74	MJ Wellman / JD Mills Sawmill		LOW	Historical Site	Unprotected
75	E Locke / J Morse / GW Morre Saw Mill	State Forest	LOW	Historical Site	Protected
76	Coller Sawmill	State Forest	LOW	Historical Site	Protected
77	A Blake Mill	State Forest	LOW	Historical Site	Protected
78	Ball Mill	State Forest	LOW	Historical Site	Protected
79	Jos Sawmill		LOW	Historical Site	Unprotected
80	Harris Sawmill	State Forest	LOW	Historical Site	Protected
81	Stave and Sawmill		LOW	Historical Site	Unprotected

MAP #	SCENIC RESOURCE	ECOLOGICAL/ GEOLOGICAL RESOURCE	RECREATIONAL VALUE ³⁹	HISTORICAL VALUE	PROTECTION STATUS
82	Grist Mill		LOW	Historical Site	Unprotected
83	Grist, Potash, Chair, Brush, Stave shops		LOW	Historical Site	Unprotected
Unusual Geologic Features					
84	Balance Rock	Glacial Features	LOW/MEDIUM	Historical/Cultural Site	Unprotected
85	Indian Cave	State Forest	HIGH Off MMM Trail		Protected by WSF
86	Root Cellar		LOW		Unprotected
87	Spirit Spring		LOW		Unprotected
88	Kidder Brook Falls	Scenic	LOW No Access High potential	Mill site	Unprotected Private Property
89	Indian Kettles		LOW		Unprotected
90	Devil's Washbowl	Glacial Feature Waterfall with scour hole	HIGH		Protected by Iversen MGLCT
91	Wabeek Rock	Glacial Erratic	LOW	Historical Recreation Site	Unprotected
92	Granite Quarry	Former	LOW	Historical Industrial Site	Protected by WSF
93	Bog Ore	State Forest	LOW		Protected
94	Iron Mines		LOW		Unprotected
Farms					
95	Chase Hill Farm		LOW		Protected
96	Crossroads Farm		LOW		Protected
97	Brush Valley Sheep Farm		LOW		Unprotected
Scenic Views					
98	Views from Mount Grace	Monadnock	HIGH Panoramic, tri-state views	Fire Tower	Protected
99	View from Flower Hill of Mount Pisgah		HIGH Northerly View		Not Protected
100	View from Shepardson Rd. of Eastern Hills		HIGH Roadside Vista across a hay field Easter Sunrise Service		Unprotected
101	View from Moores Pond of Mount Grace and Hills		HIGH Roadside Vistas		Although the Bowers Farm fields are protected, the view is not.
102	View from Overlook Trail of Wheeler's Pond		MEDIUM		Protected
103	View from Chase Hill of Mt. Monadnock		HIGH Roadside Vista		Although the Chase Hill Farm is protected, the view is not.
Warwick Schools					
104	School 1 near fire station		LOW		Unprotected
105	School 2 Richmond Road		LOW		Protected
106	School 3 Brush Valley School		LOW		Unprotected
107	School 4 Chestnut Hill Road		LOW		Unprotected
108	School 5 Gale Road	State Forest	LOW		Protected
109	School 6 Wendell Road		LOW		Unprotected
110	School 7 Flower Hill School		LOW		Protected
111	School 8 Winchester Road		LOW		Unprotected
112	School 9 Royalston Road		LOW		Protected
113	School 10 near Atwood Cemetery		LOW		Unprotected
114	Warwick Community School		HIGH		Limited Protection

Sources: Natural Resources Program Inventory of Sites with Natural Resource Potentials, 1974; Franklin County Rural Landscape Preservation Plan Report, Franklin County Commission, 1992; Warwick Open Space Plan Committee, 2009, 2018.

WARWICK

Plan of the Town of WARWICK
made Feb. 17 1963 for the Observance of
the Bicentennial of its incorporation as a town
Based on the Topographic maps as made
by the United States Geological Survey
Scale one mile equals two inches Revised Jan. 1, 1970
drawn by Charles A. Morse



1970 map of Warwick by Charles A. Morse, showing locations of cellar holes, Indian kettles, and other historic features.

H.1 Stream Corridors

Stream corridors include the combination of the water body, streambed, banks and surrounding vegetation, which is significantly different from the surrounding uplands. Stream corridors provide wildlife habitat, scenic views, and recreational opportunities for the residents of Warwick. Warwick has many small streams and brooks that can be seen from the roads that follow them. These include Mountain (Mirey) Brook along Route 78 and Mill Brook along Northfield Road, both in northern Warwick. In the southern section of Warwick, Moss Brook follows along Flagg and Quarry Roads; Darling Brook is located in the vicinity of Wendell Road; and the lower reaches of Orcutt Brook are located in the vicinity of Route 78.

H.2 Ponds and Lakes

Laurel Lake

Located in the north central part of Erving State Forest, Laurel Lake (originally Long Pond) has approximately ten of its fifty-one acres in the Town of Warwick. Erving State Forest was established in 1920 under the State Forest Act. Heavily used, improvements to Laurel Lake were necessary over time and these improvements were subsequently made by the Civilian Conservation Corps (CCC). The improvements include road improvements, a beach, trails, vistas, picnic areas, campground, parking area, new dam at the outlet, and forestry work.

Moore's Pond

Located on Wendell Road at the intersection of Shepardson Road, Moore's Pond was the site of a sawmill originally owned by Ebenezer Locke and was then called Lockes Pond. The sawmill changed hands over the years. Ebenezer Locke was succeeded by Jeduthan Morse who died in 1760, however, the impoundment was then called Morse Pond. Subsequent to Morse, the sawmill was owned by Deacon George Moore who operated it until 1880. Since Moore's ownership, the pond has been called Moore's Pond.

Richard's Mill Pond and Richard's Reservoir

Located in the northeast section of Warwick, both Richard's Mill Pond and Richard's Reservoir were the sites of a sawmill belonging to Samuel Scott and a gristmill belonging to David Ayres. These were set up under the direction of the Proprietors of Gardner's Canada.

Hastings Pond

Hastings Pond was used by town residents as a local ice pond. The house at the northern end was originally a storage house/store for the ice.

Impoundments

Old impoundments in the Town of Warwick were built in the 18th and 19th Centuries for use by the many water-powered mills. These impoundments include Hubbard's Pond, Richards Mill Pond, Gale Pond, Richard's Reservoir and Moore's Pond. Several impoundments have shrunk in size and have returned to the status of swamps after floods washed away many of the dams. These include Harris Swamp, which was the Root and Lesure Company's Pond; Stevens Swamp, which was the N.G. Stevens Pond; and Bass Swamp, which was Fay and Moore's Pond.

H.3 Wetlands

Wetlands like black gum swamps, kettle hole level bogs and acidic graminoid fens usually contain a greater diversity of plant and animal life than surrounding landforms. They are also often connected to extensive watercourse networks both above and below ground. Wetlands provide basic ecosystem services such as water retention, and water purification, and flood water control, and sequester and store carbon which helps mitigate climate change. Wetlands often provide rare species habitat. According to the MA Division of Fisheries and Wildlife, most of the known rare species in the Town of Warwick are wetland species and their presence reflects the existence of intact wetland systems found in the Town. These species include the Wood Turtle, Jefferson Salamander, and Squawfoot. Some of the rare species now include dragonflies, which are also wetland based species.

Warwick residents consider all of the wetlands as being particularly scenic. For all these reasons wetlands should be valued in Warwick. The Wetlands Protection Act protects wetlands and the public interests they serve by requiring a careful review of proposed work that may alter wetlands. The law also protects other resource areas, such as land subject to flooding (100-year floodplains), the riverfront area (added by the Rivers Protection Act), and land under water bodies, waterways, salt ponds, fish runs, and the ocean. The Rivers Protection Act provides additional protection from land uses that may have a negative impact on the long-term viability of flora and fauna along the perennial streams and rivers. However, since wetlands are often in low lying areas of the landscape, their normal water flows and the quality of the water can be greatly influenced by the use of nearby lands. Winter salt and sand use on Warwick's roadways can, over time, kill trees and vegetation that depend on the maintenance of specific growing conditions, which can be affected by salts and oils originating from road surfaces. Warwick currently uses salt only on paved roads, and uses sand only on gravel and dirt roads.

H.4 Resources Associated with Large Blocks of Protected Contiguous Forest

The presence of large blocks of contiguous forest, which are permanently protected from development, has ensured that for the near future Warwick residents will live in a rural community. These blocks of contiguous forest include Mount Grace State Forest, Warwick State Forest, and the Iverson Conservation Area. As more and more landowners protect their forestlands with conservation restrictions, the gaps between permanently protected forest blocks will lessen. Because so much of the community's forests are protected, clean and ample surface and groundwater supplies, wildlife habitat, and public access to outdoor recreational and sports activities such as hunting and hiking are made possible. Contiguous forests also provide residents with the day to day scenery that comes with living in a forested community that has drawn many of the town's residents. Contiguous blocks of forest also provide opportunities for efficient management of the timber resources whether on public or private land. Maintaining and expanding contiguous, connected forested areas is also critical for species movement over the landscape. This is becoming more important as climate change is forcing many species to migrate north and to higher elevations. Connected open space will help facilitate this movement of plants and animals.

H.5 Significant Historic Sites and Landscapes

Warwick Town Center

Located in the geographic center of Warwick, the Town Center is identified by residents of Warwick as being of cultural and historic value as well as serving as the focal point of town activity. Warwick Town Center is considered to be a typical New England cross-roads village center. The Town Center combines scenery, historic land use patterns, historic structures and a cemetery within a landscape that has ecological and scenic values of its own. The Town Center offers Warwick residents access to historical resources including the homogeneity of three architectural styles. These styles include late 18th Century with the primary influence of the Federal Period; 19th Century Victorian; and Greek revival seen in the churches in the Center.

Warwick Center Cemetery

Warwick Cemetery is located on Route 78 approximately 0.6 miles south of Warwick Center. The first section of the cemetery was given to the town by Moses Leonard. By 1818, it was apparent that additional land would be needed and one and one half acres were added by purchase from Bunyan Penniman. Subsequent sections were added by donation of land by Town residents. Many prominent citizens have their graves in Warwick Cemetery. The oldest section of the cemetery contains slate tombstones dating back to the late 1700s with several interesting epitaphs. The newest section has polished granite stones and a large war memorial with a second memorial for a man killed while erecting the monument.

Grist Mill Stones and Town Fountain

Located at the corner of Hotel Road and Winchester Roads in Warwick Center, these mill stones, placed one atop the other as in original use, are from the first grist mill in the Town of Warwick. They are considered to be protected because they are on town-owned land in front of the library. Adjacent to the stones stands the Town Fountain, established in 1900, which provides drinking water from an old gravity fed system originating on Mount Grace. The Highway Department continues to maintain the fountain and insulates it in the winter so it will not freeze. Residents still use the water from the fountain, especially when a power outage occurs.

Warwick Town Forest

In 1925, the Town of Warwick acquired and established a Town Forest located in the vicinity of the intersection of Hockanum Road and Wendell Road. The area consists of 70.5 acres located west of Wendell Road and 16.5 acres located south of Hockanum Road and east of Wendell Road. The property is bordered on the east by shrub swamp wetland along Darling Brook. There is also a shallow marsh along Darling Brook in the interior portion of the forest west of Wendell Road. The diversity of plants and wildlife give the area a high potential for nature study and wildlife observation.

Over the years there have been six additions to the Town Forest. These parcels are not all connected, but are collectively known as the Warwick Town Forest. In 1945, the Town was deeded an 80 acre lot, known as the Wilbur Lot, located on the Warwick/Orange town line west of Orange Road. This lot had been taken for back taxes in 1943 and was put up for auction by the Town, but no bids were received. In 1948, Town Meeting voted to purchase the 53 acre Allen Lot. A small amount of acreage was given to Patricia Johnson in 1998 when the Johnson/Lincoln

family gifted to the town the land for the Warwick Community School. In 1970, the Town tried to auction off a 12-acre parcel on Athol Road near Shoemet Pond, which had been taken for back taxes. No bids were received so the parcel was deeded to the Town.

From 2002 to 2004, the Warwick Open Space Committee raised money through various grants and private donations for the purpose of obtaining three parcels of land on Hockanum Road. The Mount Grace Land Conservation Trust assisted with the acquisition. The three parcels total 36 acres and include an overlook of Brush Valley and Wheeler Pond. Two of the parcels are protected through conservation restrictions. In 2007, Town Meeting voted to acquire by gift for conservation purposes an 8.8 acre parcel known as the “Black Gum” parcel. The purchase was funded entirely by private donations. Most recently, in 2017, the Town Forest was expanded by the acquisition of 88 acres abutting the Black Gum parcel and the original 1925 Town Forest parcels, known as the Victoria Shaw lots. Town Meeting voted to purchase the land using a State grant of \$100,000 allocated to the Town through the 2014 Environmental Bond Bill.⁴⁰

The Town Forest is available to residents for recreation and is also managed by the Town for timber, which provides revenue to the Town. Several parcels are permanently protected from development through conservation restrictions, but some of the Town Forest is not permanently protected.

Mount Grace State Forest

Mount Grace was proposed as a state forest in 1916, but no action was taken until 1920 when the forest was officially established with the purchase of 1,400 acres. This was one of the few early state forests where land was acquired for more than \$5.00 per acre, which was justified by the extensive growth of high quality white pine. Civilian Conservation Corp Camp members worked extensively at Mount Grace in 1935 and 1936. Most of their projects had a recreational focus. Work included construction of parking lots, ski trails and a 4.7 mile snowshoe trail. They also built an Adirondack shelter and council ring at Ohlson Field, as well as a rustic shelter at the mountain. The two major recreation areas are Gulf Brook Picnic Area and Ohlson Field.

The Gulf Brook Picnic area in Mount Grace State Forest was a particularly scenic area located on the west side of Route 78 north of Warwick Center in a grove of small pines. Construction of this area was begun by state workers in the early 1930s and subsequently improved by CCC workers. There is a faint track that serves as an entrance with no defined parking area available. Mountain Brook runs along the western edge of the picnic area. There is a dry-laid fieldstone wall along both sides of the brook for several hundred feet. At the northern, or downstream end, of the picnic area, there is a low concrete dam, which creates a small basin for wading. This area also has several dozen distinctive fire pits, each with a large flat stone at the back and several smaller stones on either side. Unfortunately an ice storm damaged many trees about 20 years ago and a root rot fungus became established which slowly killed the majority of trees. Logging was delayed until falling dead wood became a public hazard (about 10 years ago), and as a result many of the trees were too rotten for any commercial use and were left lying on the ground. Many of the beautiful stone fire pits were destroyed by falling trees or logging equipment. In the years since logging mixed regeneration has become established on most of the picnic area the

⁴⁰ “Town of Warwick, MA Forestlands” booklet, compiled by George Day of the Warwick Open Space Committee, November 2017.

wading pool has become filled with sediment and the area behind the dam was washed out during a hurricane and not repaired. The area is in transition as the new forest grows to replace the pines.

Laurel Lake

Located in the north central part of Erving State Forest, Laurel Lake has approximately ten of its fifty-one acres in the Town of Warwick. Erving State Forest was established in 1920 under the State Forest Act. A number of early modern cottages still survive along the banks of the lake for use as seasonal homes. A public swimming beach is located completely within Warwick.

Ohlson Field

Located on the west side of Route 78, Ohlson Field (once known as Manning Field) consists of a paved parking lot with an adjacent gently sloping grassy field. The area was developed as the terminus of several ski trails built by the CCC. The trails have since become overgrown and are now maintained as snowmobile and hiking trails. The two major remaining CCC features are a ninety-foot diameter council ring, which consists of a low fieldstone retaining wall on the southern side with an area for an open fire in the center. The second CCC feature is a rustic open-front Adirondack shelter located at the southern end of the field. It is a gable end structure, approximately eight feet by twelve feet with a front overhang.

Wawbeek Rock

Located along the west side of Hastings Pond Road, Wawbeek Rock is a granite boulder about sixteen feet high and twenty feet wide. It was, however, believed to be originally thirty feet high, but was split for possible use as a building stone. The Athol YMCA, in 1916, had a boys' summer camp at the end of Hastings Pond Road. The boys adopted the Native American name, Wawbeek, meaning Big Rock, for their camp. A former granite cutter and resident of Warwick, Fred Bergquist, cut the name "Wawbeek" into the top of the rock. Beneath this name are the words, "In the Beginning God".

Granite Quarry

A Granite Quarry is located along the west side of Quarry Road and was in operation from about 1880 to 1890. A small woods road provides access. The quarry is about one acre in size and is partially overgrown. Large blocks of granite are piled and scattered over the area making the quarry difficult to walk through. The granite posts placed around the town park in 1870 came from this quarry. Many houses in Warwick rest on cut granite and it is speculated that these were quarried in this area.

Old Civilian Conservation Corp Camp off White Road

This former site of the CCC Camp off White Road contains the foundation of one of the buildings, a fireplace, and a new building approximately three-fourths completed. The surrounding open field is bordered by a small swamp.

Prison Camp/ Transient Camp on Richmond Road

The former camp became a minimum security prison where country boys "did their time" doing work on the Mt. Grace State Forest and the Warwick State Forest under the supervision of the MA Department of Natural Resources. Later it became a minimum security work release site

under the supervision of the Department of Corrections. The facility was abandoned in the late 1980s or early 1990s. More recently it was used as a training site for troops going to Iraq and Afghanistan. A few years ago, following a serious fire at the facility, all buildings were torn down and the site leveled.

H.5.1. Significant Historical Agricultural Landscapes

Warwick values its historic agricultural landscapes not only as scenery but also for their being reminiscent of how the land was first settled. Farming in Warwick began to develop in the mid-18th Century. In Franklin County, the upland farms such as those in Warwick concentrated on grazing and milk production. The fields and grazing areas followed the natural shape of the terrain resulting in open stony grazing areas bordered by woodlands. In Warwick, there are four specific agricultural landscapes that were identified in the 1992 Franklin County Rural Historic Landscape Preservation Plan: the Town Center, the Keith property on Chestnut Hill Road, the H. Grout (c.1871) property on State Road, and the C.W. Bass (c.1871) property on Route 78. Additionally the document cites multiple properties along Route 78, Wendell Road, and State Road.

Warwick has supported the protection of some of the remaining pasture and cropland by permanently protecting the land from development. Chase Hill Farm (including the former Bowers Farm at Mayo 4 Corners) was protected through the Massachusetts Department of Agricultural Resources' Agricultural Preservation Restriction (APR) Program. One way of conserving remaining unprotected farmland would be to prioritize the parcels of those landowners that want their land protected. Then, by contributing five percent of the cost of the development rights as a match to the funds put up by the APR Program, the Town will be more competitive in gaining access to this state funding.

H.6 Unusual Geological Features

Indian Kettles

The "Indian Kettles" are glacial potholes located east of Old Winchester Road just north of Rum Brook Road, Robbins Road a short distance west of Richards Reservoir and on the old Stevens property east of Winchester Road. Local legend has it that the kettles were used by Native Americans to cook food. Similar potholes have been reported to occur on the west side of Barber Hill off Route 78.

Caves

The Caves are located approximately one half mile west of Flagg Road and one-tenth mile north of Stevens Swamp. The Caves are formed by an immense granite ledge, which has partially broken forming two ledge overhangs. One overhang has created a cave about thirteen feet in diameter and is circular to oval in shape. The second cave is rectangular and about fifteen feet long, six to eight feet wide, and from five to seven feet high. A second cave site is located off Kelton and Royalston Roads.

Devil's Washbowl

Devil's Washbowl is located at an old mill site at the headwaters of Hodge Brook, approximately 0.4 miles west/southwest of the former Clark's Sawmill on Athol Road. Immediately above the mill site is a waterfall about fifteen feet high. At the base of the waterfall is a large scour hole, which was created by a swirling vortex of water washing small stones and gravel around. In time, the cutting action of the gravel wore a scour hole in the bedrock. This depression is known as the Devil's Washbowl.

H.7 Significant Scenic Views

Overlook Trail from Hockanum Road Parking Area

As part of a “Self-Help” grant awarded to Warwick, the Town installed a convenient trailhead parking area on Hockanum Road at the base of the Hockanum Hill. An existing trail leads to a former overlook, which offered views to the southeast including part of Wheeler Reservoir, but has become obscured by trees. Removing some of the trees could restore the view.

Mount Grace

Located in Mount Grace State Forest, the peak of Mount Grace is 1,617 feet above mean sea level and is the highest point in Warwick. At the top of Mount Grace is a forest fire lookout tower, which offers a good view of the surrounding hills and valleys as well as Mount Monadnock in New Hampshire.

Kidder Brook Falls

Kidder Brook Falls are two cascading waterfalls located on private property 300 yards east of Old Winchester Road. These are reached by walking 400 yards east on Old Robbins Road and then seventy-five feet north to the brook. The stream drops about fifty feet in elevation in 150 feet of horizontal distance. In the overall cascade, there are several waterfalls, which drop six to eight feet vertically.

Lover's Retreat

Located in the northwest corner of Warwick, the Lover's Retreat area is considered to be particularly scenic. Here Pauchaug Brook drains a small pond, crosses the state line into New Hampshire, and descends through a rocky gorge.

H.8 Unusual Natural Communities

Black Gum Swamps

Black Gum Swamps are deciduous swamp forest characterized by black gum and occur on mineral, shallow muck or peat soils that are either seasonally flooded to saturated. These swamps occur below 1000 feet in elevation, have relatively small watersheds, limited drainage and are usually isolated from perennial streams. They occur in depressions where the water seeps from groundwater, rainwater, or seasonal intermittent streams. They are characterized by hummocks and hollows that are seasonally flooded. A co-dominant species occurring with the black gum is the red maple. Under the tree canopy, in the shrub layer, Black Gum Swamps

usually have winterberry and highbush blueberry. Cinnamon fern is the most abundant herbaceous species present on the hummocks and sphagnum mosses are found in the hollows.

Kettle Hole Level Bogs

Kettle Hole Level Bogs occur in ice block depressions in sandy glacial outwash. The vegetation in these areas includes high bush blueberry and swamp azalea in the outer areas and rhodora in the interior moat areas. The mat areas of the bog have a mixture of tall and short shrubs that are predominantly ericaceous (members of the Heath family). A mixture of specialized bog plants including pitcher plants and sundews grow on the hummocky sphagnum. Highly acidic standing water in the moats, without fish populations, functions as vernal pool habitat, providing important amphibian breeding habitat sites.

Acidic Graminoid Fens

Acidic Graminoid Fens most often occur along pond margins, slow-moving streams, and along the outlet streams of stream headwater peat lands. They are considered the most species-rich of acidic peat land communities. Graminoid and herbaceous species are the dominant characteristic plant species. Typical graminoids include beaked sedge, slender woolly-fruited sedge, white beak-sedge, twig-sedge, and pond shore-rush. Associated herbaceous species are St. John's Wort, pickerel weed and rose pogonis. Large cranberry can also be abundant.

Acidic peat lands like the Kettle Hole Level Bogs and Acidic Graminoid Fens experience extended periods of saturation, lack of nutrients, high acidity and low oxygen making them inhospitable to many animal species. Winged animals and large terrestrial animals can use peat lands as part of their habitat, and then move on when conditions are unfavorable. Moose and white-tailed deer use acidic peat lands for browsing and grazing. Many bird species use peat lands for part of the year as nesting or foraging habitats including Swamp and White-throated Sparrows, Common Yellowthroat, Olive-sided and Alder Flycatchers, Red-winged Blackbirds, and Gray Catbirds. Many species of dragonflies and damselflies inhabit acidic peat lands, especially where there is adjacent open water. The acidity and low oxygen content of level bogs makes them poor habitat for most amphibians and reptiles, although some species can breed in shallow pools that form among the sphagnum hummocks.

In addition, Warwick's BioMap2 report⁴¹ identifies the following Priority Natural Communities in town:

Forest Seeps are in areas on wet slopes in hardwood forests where groundwater seeps out of the earth. The overstory is similar to that of the surrounding forest, but many typical wetland ferns, herbs, and shrubs occur as well.

Northern Hardwoods-Hemlock-White Pine Forests have a mix of evergreen and deciduous trees, with a closed, full canopy, and sparse shrub and herbaceous layers. It commonly occurs on north facing slopes and ravines with moderately acidic soils.

⁴¹ BioMap2 Warwick town report, 2012. http://maps.massgis.state.ma.us/dfg/biomap/pdf/town_core/Warwick.pdf

The Shallow Emergent Marsh community is a graminoid wetland found in broad, flat areas bordering rivers or along pond margins. They commonly occur in abandoned beaver ponds, and differ from Deep Emergent Marshes in having less standing water.

Spruce-Fir Boreal Swamps are forested wetlands dominated by red spruce and balsam fir. These swamps are typically found at stream headwaters or in poorly drained basins in the higher, western and north-central parts of the state.

Circumneutral Talus Forest communities develop on boulder strewn slopes below slightly acidic cliffs or rock outcrops. There is often a gradient of vegetation density as the slope changes, with more trees on the lower slope.

Acidic Rocky Summits are open communities of shrubs, scattered grasses, mosses, lichens and occasional trees found on exposed rocky summits. These areas are dry with little soil, and can often be found as patches within other ridgetop communities.

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.

H.9 Warwick Schools⁴²

The town of Warwick was incorporated in 1763, after two French and Indian wars. By 1765 the population of Warwick had reached 191 and schools were necessary. Four school districts were established by 1768, each with a School Master for December, January and February (when more boys were in school), and a School Mistress during the summer. With transportation more difficult in those days, it was necessary to have school locations that could be reached by horse or on foot. By 1771, several Rectors taught advanced classes, probably in the evenings; the students were likely growing up.

By 1785 the number of school districts had increased to nine. With Warwick's peak population at 1,256 in 1820, a tenth school district was formed in 1830. Each school was ungraded, and taught "reading, riting and 'rithmatic." Each district was managed separately and was responsible for providing living quarters for the teacher, a school building and wood for the stove for heat. The ten districts (shown on maps of Warwick dated 1856 and 1871) were spread throughout the town:

1. just south of the old fire station
2. on the west side of the Richmond Road well north of Richard's Reservoir
3. Brush Valley School on Route 78 on the west side, north of Hockanum Road
4. Chestnut Hill Road at Wilson Road on Arthur Shepardson property
5. Gale Road just south of Beech Hill Road
6. Wendell Road opposite H. Grout site (currently Ralph Hill house)
7. Flower Hill School on Northfield road south of Bass (White) Road

⁴² This section excerpted from the March 2019 edition of the Warwick Community Newsletter.

8. Winchester Road (Route 78) just north of Robbins Road
9. Royalston Road just southwest of the first Tully Brook crossing
10. northwest of town at east end of the road to Atwood Cemetery

Although schools 11 and 12 were formed around 1850, by 1880 Warwick was back to having only ten districts. No locations were found for these two schools. The state Board of Education, formed in 1837, asked the town to take control of the ten districts; they did not concur. However, in 1895, a school union (#22) was formed between Warwick, Northfield, Leyden and Gill to manage education through eighth grade; a superintendent of schools oversaw union #22 with the ten districts still operational.

The town started a select school (High School?) in 1813, which was held for several years. In 1883 the town voted \$100 to support an eight-week evening school for students over 12 years of age. Its teachers had some college education; this system continued until 1897. Beginning around 1897, the state provided tuition at Advanced Schools (that is, high school level education) if the parents provided transportation or board. By 1898 there is a record of two students enrolled in Orange High School; others may have gone to academies at Deerfield and New Salem (paid for by parents).

By 1901, Warwick had closed the ten district schools and moved all students to Warwick Center School. Music and drawing were added to the curriculum, and the school was now graded. All teachers were graduates of Normal Schools (teacher's colleges). With further enrollment, Brush Valley School reopened and operated until 1931. In the winter of 1929, Center School burned to the ground. While the building was unusable, classrooms were set up in the Town Hall and Brush Valley. A new Center School of two rooms was dedicated by the fall of 1930. The Center School became overcrowded when Brush Valley closed in 1931. Expansion to three or four rooms was investigated between 1941 and 1944, but it did not occur due to discussions about regionalization. In 1944 grades 6, 7 and 8 were moved to the Town Hall.

After an original vote was not passed (1950) for a regional high school, it was approved in a second vote in 1954. Pioneer Valley Regional School opened in 1957 for grades 7 through 12. Use of the Town Hall for school ceased at that time as a third room was added to the Center School in 1956. In 1999 the new Warwick Community School opened. The Center School was demolished and the site used for the police department and the new fire station.

I. ENVIRONMENTAL CHALLENGES

I.1 Hazardous Waste Sites and Landfills

According to the Massachusetts Department of Environmental Protection (MA DEP) data, there are eight hazardous waste sites in Warwick where releases of hazardous materials have been reported. Seven of the eight releases were for oil. All of the sites are considered closed and do not have use limitations.⁴³ According to MA DEP data⁴⁴ there are two landfills and dumping

⁴³ <https://eeaonline.eea.state.ma.us/portal#!/search/wastesite/results?TownName=WARWICK>

grounds in town, both of which are inactive. There is little information available for the former dumping ground on Route 78 in Mount Grace State Forest other than it is currently inactive. The other landfill, located on Garage Road was closed and capped in 1999 and currently serves as the town's transfer station. This landfill was unlined and accepted municipal solid waste. There is no indication of environmental problems associated with either one of these sites.

I.2 Forestry Issues

Climate change and related impacts from increasing temperatures poses a major threat to the health of Warwick's forests. These include change in forest structure, droughts, invasive plants and insects, and diseases. Hemlock pests may have significant consequences for Warwick's forests, especially in the wooded ravines and wetlands. The hemlock wooly adelgid is killing hemlocks in the region as its range has extended north in recent years. Another threat to the hemlocks has been the hemlock looper, which has been identified in Franklin County. Other potential threats to Warwick's forests include the Asian Longhorned Beetle, an invasive wood-boring insect that attacks hardwood trees, including maple, birch and elm, and the Emerald Ash Borer, a non-native invasive insect that attacks ash trees. Both pests have been confirmed in Massachusetts and are being monitored to avoid further spreading.

While active management is not suitable for all lands, sustainable forestry can increase resilience to climate change through increasing the diversity of species, size and age of trees, improving wildlife habitats, eliminating invasive species, helping to control the spread of disease, and promoting carbon sequestration and storage. Timber and cordwood harvests provide landowners with a source of periodic income, making landownership more affordable and potentially reducing pressure to sell or develop a portion of the property. Harvesting is also a revenue source for the Town and helps support local forestry jobs and secondary wood product manufacturers and craftspeople. Working with a licensed forester is important to ensure forestry best management practices are followed during a harvest to protect soil and water quality. In addition to selling timber, carbon markets may be another revenue source for forest landowners. Carbon markets pay landowners each year based on the amount of carbon sequestered by the forest. These markets are complex, however, and difficult for individual forest landowners to access.

The State's Chapter 61 current use program is another method to reduce the cost of owning land. Forest land under Chapter 61 is taxed at its current use rather than for its development potential. In return, the landowner cannot convert the land to another use while in the program. If the land is to be sold or converted, the Town has the right of first refusal to purchase the land. The Town can also assign its right of first refusal to a land trust or conservation organization.

The aging of forest landowners in the region presents another challenge to the future of Warwick's forests. These lands could be sold or broken up into smaller parcels, making conservation efforts and forest management more difficult, and development more likely. Outreach to landowners about options and the resources available to plan for the future of their land may be needed.

⁴⁴ <https://www.mass.gov/lists/massachusetts-landfills-transfer-stations-compost-sites-recycling-facilities>

I.3 Chronic Flooding, Erosion, and Sedimentation

According to 2005 MassGIS land use data, there are 10 dwellings located on 6 acres of Warwick's 259 total acres of floodplain. In Franklin County, most floodplain maps are several decades old, and may not represent an accurate picture of the floodplain on the ground today. In addition, greater storm intensities as a result of climate change means that flooding that was once considered to have a one percent chance of occurring in any given year is now occurring on a much more frequent basis. In addition to the 100-year floodplain, there are a number of rivers and feeder brooks in Warwick with the potential to cause localized and/or chronic flooding.

According to the 2014 Warwick Multi-Hazard Mitigation Plan, flooding events in Warwick have been growing more serious and extending in duration in recent years. Key areas of concern include:

- Winchester Road
- Wendell Road/Moss Brook
- Hockanum Road (box culvert)
- Gale Meadows on Athol and Gale Roads
- Kidder Brook on Robbins and Old Winchester Roads
- Bass Road
- Northfield Road
- Richmond Road near Richards Reservoir
- Rum Brook at Rum Brook Road
- Athol Road near Sheomet Pond
- Hastings Heights Road

The plan also recommends mapping Fluvial Erosion Hazard (FEH) zones, which are areas along rivers and streams that are susceptible to bank erosion caused by flash flooding, and seek to limit new development in these areas. Rivers and streams alter their course by erosion of their banks and the deposition of sediments. This natural process can be accelerated and exacerbated by human activities that increase stormwater runoff, alter river banks and vegetation, and impact aquatic and riparian habitat. Roads, property, and infrastructure can be threatened by eroding river banks. In addition to property and infrastructure damage, sediment from eroding banks can compromise habitat for fish and aquatic life.

I.4 New Development

Warwick has experienced very little new development in recent years. As landowners age, however, large parcels have been subdivided into smaller parcels in town. This may lead to more development over time as it is harder to manage and conserve smaller parcels. Another form of development, large ground-mounted solar installations, are becoming more common in the region. A number of towns in the region have adopted zoning bylaws to regulate the siting, construction, maintenance, and decommissioning of large-scale ground-mounted solar installations. These bylaws seek to minimize potential negative impacts of large installations

while also encouraging renewable energy by identifying areas in town where these systems would be most appropriate. Bylaws typically limit installations on slopes over 10% or 15%, and require erosion control and stormwater management plans. In most towns herbicides are prohibited for vegetation control, and stormwater management must be included as part of the ongoing operation and maintenance plan. Decommissioning requires re-vegetation of a site. Land clearing must be limited to what is necessary for the construction and maintenance of the system.

Some towns specify land that should not be used for large-scale solar systems, such as high quality soils and productive forest and farmland, and NHESP priority habitat and BioMap 2 Core Habitat areas. Towns may also limit the size of any single installation, with limits typically ranging from 5 – 10 acres. To offset the impact of large-scale ground-mounted solar systems that result in clear-cutting of forests, towns can also require a percentage of forest on the site be placed under protection from development.

I.5 Ground and Surface Water Pollution

Warwick has very few impaired surface water bodies. The sparse development pattern and heavily forested character of the town helps protect surface water bodies from potential contaminants. One potential source of non-point pollution is stormwater runoff from nearby roads. Gravel and dirt roads in rural areas can also contribute sediment to nearby water resources from flooding and erosion of the roadway surface. Managing stormwater through best management practices (BMPs) along dirt roads can help maintain the roadway surface and reduce the amount of sediment in nearby streams and ponds. The purpose of BMPs is to slow, filter, and infiltrate stormwater runoff from the road. Best Management Practices (BMPs) for unpaved roads can improve water quality and potentially reduce maintenance costs by keeping more of the road bed on the road and not in adjacent streams.

Ground water pollution is a concern as all areas in town are served by private wells. The potential sources of contamination of private wells in Warwick are on-site septic systems, sub-surface fuel tanks, manure piles, feed lots, and driveways and runoff of road salt or other contaminants such as herbicides, pesticides, and pathogens. These are all examples of non-point or point source pollution. In 2017, a low salt/no sand area was re-established in the center of Town to help protect private wells that are close to the road. Signs have been erected regarding the use of low salt in this area. In 2017, Town Meeting approved a town-wide ban on the use of the herbicide class 2-4-D (commonly called RoundUp) and glyphosate, which has been linked to cancer in humans.

In 2016, the State carried out a Source Water Assessment Program (SWAP) Report⁴⁵ for the Warwick Community School that concluded there is a moderate threat to the school's well due to the absence of a hydrogeologic barrier to prevent contamination migration from the septic system leach field. Another threat is the floor drain in the boiler room which discharges into the septic system. There is potential for hazardous materials to flow accidentally into the floor drain which could contaminate the well water. The report recommends routine inspection and

⁴⁵ <https://www.mass.gov/files/documents/2016/08/or/1312012.pdf>

maintenance of the septic system, education on the proper disposal of hazardous chemicals, and to consider creating an Aquifer Protection District Bylaw for the area serving the school's well.

I.6 Environmental Equity

Warwick is a rural community with an aging population. There are no Environmental Justice areas in town. Outdoor recreation resources such as hiking trails and picnic areas can be found throughout town in the State and Town forests. Three public swimming areas are available in the southwest corner (Laurel Lake), center (Moores Pond), and northeast (Sheomet Pond) section of town. Active recreation resources including basketball and sports fields are concentrated in the center of town. In general residents have equal access to the resources in town. As the population continues to age, a focus on creating accessible outdoor and indoor recreational resources for seniors will continue to be needed.

I.7 Other Environmental Problems

Several environmental problems were identified by the Open Space Committee, in addition to the issues already discussed, during the process to update this Open Space and Recreation Plan. The problems are listed below.

1. ATVs
2. Beavers & flooding
3. Maintenance of fire ponds
4. Trail maintenance
5. Invasive species
6. Eutrophication of ponds
7. Illegal dumping
8. Decline of open fields
9. Houses built in fields
10. Runoff from roads to streams

Five of these problems facing Warwick are discussed in more detail in the following paragraphs.

All-terrain vehicles (ATVs)

Warwick has large areas of undeveloped land that is used, often illegally, by off-road vehicles. In addition, many of our smaller back roads are used, also illegally, by ATVs. In the 2019 Warwick Open Space survey, 84% of respondents felt we should discourage ATV use in town (9% felt we should encourage it). ATVs pose several problems: they can cause significant trail erosion in hilly areas, which can be detrimental to water quality and hamper the use of trails by other lower-impact users. "Clean drinking water" and "Lakes/streams/ponds" were important or very important to 100% of survey respondents. ATVs also make considerable noise, disturbing the tranquility of our rural setting and sometimes harassing or killing wildlife in areas otherwise far from most human activity. "Peace and quiet" was important or very important to 100% of respondents. ATV use on private land often represents trespass (state law requires written

permission from landowners), and ATVs are illegal on most State Forests (including those in Warwick) and all Wildlife Management Areas. Use of ATVs on back roads represents a safety hazard, as many riders travel at much higher speeds than is typical for automobiles on unpaved roads.

Beavers and Flooding

Beaver activity along streams in Warwick has caused the impoundment of significant amounts of water, resulting in flooding and the erosion of roadways and bridges, including White Road, Bass Road, Northfield Road, and the loss of hay fields on Winchester Road. An example of the flooding damage occurred since 1990 along three miles of Mill Brook in northwestern Warwick. The brook originates at Stevens Swamp near the Northfield border. The beavers created a dam at the outlet (dam) of the swamp, which caused flooding and created a large lake. Several hundred feet downstream from the dam another beaver dam was built and by 1997, the marsh had become a significant body of water which overflowed the surrounding woodland, killing many pine, maple and birch trees. Further downstream, under the White Road Bridge, beavers created a dam causing the bridge to wash out and the water level to rise several feet above road level. Other beaver impoundments along the brook at Bass Road and Northfield Road resulted in the creation of an enlarged marsh and death of large stands of red maple. The activity at Bass Road caused several floodings of Bass Road, limiting access to several homes. To alleviate this problem, the Williamsons (local residents) installed a wire device in a culvert to discourage the beavers and keep the brook open.

Beavers have made repeated efforts to raise dam elevations at Moores Pond, Johnsonian Pond, Stevens Pond, Laurel Lake and Sheomet Pond. At Moores Pond the beavers repeatedly raise the dam level three to six inches which must be removed unless a storm flow is large enough to clear the dam. The multiple dams above Moores Pond have flooded forest duff and released tannins to the pond which reduce the water clarity.

In addition, forest trees and fields have been flooded along Mill River, the area above Moores Pond and Darling Brook between Moores Pond and the new Moss Road Bridge. Several hay fields have been flooded along Winchester Road.

The 2014 Warwick Multi-Hazard Mitigation Plan lists a number of areas in town impacted by beavers, and identifies the possible flooding due to beaver dams as extensive. Of particular concern are the 485 culverts in Town that may be subject to blockage as a result of beaver activity, resulting in flooding of the surrounding areas and potentially undermining roadways. This leads to more work for the Highway Department to unblock or replace damaged culverts.

While beaver activity causes problems for the human population in some locations, it creates an abundance of habitat for wildlife. As reported by Warwick resident, Lonsdale G. Hickler, the flooding has resulted in increase use of the area by migrating and resident birds and waterfowl, including herons. River otters now ply these waters and remain year round as they have ample supplies of fish and shellfish on which to feed. Wood, snapping, spotted and painted turtles as well as several varieties of frogs and toads have been found in these areas.

Maintenance of Fire Ponds

Warwick does not have a public water supply for fire fighting, so a system of water sources for fire fighting is important. The main water source is an approximately 27,000 gallon cistern in the center of town. The cistern was built in 1958 and is within reach of roughly 30 buildings in the Town Center. It is still an important source for refilling the fire trucks, particularly in cold weather. Overflow from the Town fountain, which is fed from a spring originating at the base of Mt. Grace, keeps the cistern full. The primary reserve supply is a fire pond also in the center of town, however over 30 years it had become filled with silt and road sand. In 2006 the Fire Department dredged it and restored its capacity to 60,000 gallons. The 2019 Open Space Survey showed that townspeople generally have an interest in seeing fire ponds restored and dry hydrants installed⁴⁶. The Fire Chief has a list of priorities for improving firefighting water sources.

Trail Maintenance

Warwick has a unique array of trails. The New England National Scenic Trail (NET) is the only national trail in the area. This hiking trail is maintained by the Berkshire Chapter of the Appalachian Mountain Club. There are many types of trails on state forest lands. There is a huge interstate network of snow mobile trails, with trails in Warwick serving as a key link. For these trails, soil erosion is not a problem because of the snow cover during times of use, but clearing falling trees and branches takes a lot of work. Equestrians maintain their trails on both state and private land. Often they co-use trails with other groups, which can cause problems. For example, pallets put down by snowmobilers to cross a wet spot present a danger to horses. Often people hike on old woods roads from logging operations or on old, abandoned town roads. This is frequently difficult because all terrain vehicle (ATV) usage has caused extreme erosion.

If trails are not maintained they become impassable, may grow up with understory vegetation and become lost. At the other extreme, unmaintained trails that are heavily used can suffer severe erosion unless they are maintained. While some trails are well maintained, the aging population of Warwick residents and the popularity of other types of outdoor recreation, are all factors which make it harder to do the required trail maintenance on state, town and private property.

Several towns in the region have created Trails Committees that work on new trail creation, maintenance of existing trails, developing trail maps and signage, and hosting events to publicize recreational trail resources to residents. The MassTrails grant program provides grants to communities working on recreational trail projects and is one resource for towns looking to improve their trail networks.⁴⁷ Another resource in the region is the North Quabbin Trails Association, a non-profit organization based in Orange that promotes outdoor recreation and trail use in the North Quabbin region. Part of the group's mission is to create and maintain trails in the region.⁴⁸

Non-Native Invasive Species

⁴⁶ Dry hydrants are pipes installed with one end submerged in a water source, and one end on dry land available for connection to a pumper truck.

⁴⁷ <https://www.mass.gov/guides/masstrails-grants>

⁴⁸ <https://www.nqta.org/>

According to participants at the January 2020 Open Space and Recreation Plan public forum, invasive species have become a greater threat to Warwick since the 2010 OSRP was completed. Climate change is causing an increase in invasive pests and species. Warmer temperatures may favor invasive plants over native species, and is already resulting in more widespread damage from pests and diseases that in the past were kept in check by colder temperatures.

The non-native problem species in Warwick were introduced as ornamental species, medicinal species or are escapees from ship ballast originally from other countries that traveled across the state. Non-native invasive species become a problem when they out-compete our native plants or animals and disrupt our ecosystems. Some non-natives, such as dandelions, have become naturalized and although scattered on our landscape, do not represent a threat to the natural ecosystems.

The following list includes the non-native invasive plant species within our town; all of these species are listed as “prohibited” by the Massachusetts Department of Agriculture. Although some of the listed plants are very pretty, these species have the potential to invade and damage our natural ecosystems. The economic cost nationally is staggering due to costs of control and research and decreases in agricultural output.

Table 4-2: Non-native Plant Species Found in Warwick and Neighboring Towns

Latin Name	Common Name	Observed in Warwick	Observed in Neighboring Town
<i>Acer platanoides</i>	Norway maple	Y	Y
<i>Aegopodium podagraria</i>	Bishop's goutweed	Y	Y
<i>Ailanthus altissima</i>	Tree of heaven		Y
<i>Alliaria petiolata</i>	Garlic mustard	Y	Y
<i>Berberis thunbergii</i>	Japanese barberry	Y	Y
<i>Cabomba caroliniana</i>	Carolina fanwort		Y
<i>Celastrus orbiculatus</i>	Oriental / Asian bittersweet	Y	Y
<i>Cynanchum louiseae</i>	Black swallow-wort		Y
<i>Elaeagnus umbellata</i> var. <i>parvifolia</i>	Autumn olive	Y	Y
<i>Euonymus alatus</i>	Burning bush	Y	Y
<i>Fallopia japonica</i> var. <i>japonica</i>	Japanese knotweed	Y	Y
<i>Ficaria verna</i> ssp. <i>bulbilifer</i>	Lesser calendine / Fig buttercup		Y
<i>Frangula alnus</i>	European / Glossy buckthorn	Y	Y
<i>Hesperis matronalis</i>	Dame's rocket	Y	Y
<i>Iris pseudacorus</i>	Yellow iris		Y
<i>Lonicera ×bella</i>	Bell's honeysuckle		Y
<i>Lonicera japonica</i>	Japanese honeysuckle		
<i>Lonicera morrowii</i>	Morrow's honeysuckle	Y	Y
<i>Lysimachia nummularia</i>	Creeping jenny / moneywort	Y	Y

Latin Name	Common Name	Observed in Warwick	Observed in Neighboring Town
<i>Lythrum salicaria</i>	Purple loosestrife	Y	Y
<i>Myriophyllum heterophyllum</i>	Variable water-milfoil / Two-leaved water-milfoil		Y
<i>Myriophyllum spicatum</i>	European water-milfoil / spike water-milfoil		Y
<i>Persicaria perfoliata</i>	Mile-a-minute vine or weed / Asiatic tearthumb		Y
<i>Phalaris arundinacea</i>	Reed canary-grass	Y	Y
<i>Phragmites australis ssp. australis</i>	Common reed	Y	Y
<i>Potamogeton crispus</i>	Crisped pondweed		Y
<i>Rhamnus cathartica</i>	Common buckthorn	Y	Y
<i>Robinia pseudoacacia</i>	Black locust	Y	Y
<i>Rosa multiflora</i>	Multiflora rose	Y	Y
<i>Trapa natans</i>	Water-chestnut		

Source: Warwick Open Space Committee and Matthew Hickler, Botanist and Ecologist, Franklin County Flora Group, March 2019.

All of these species can be troublesome and difficult to control once planted. Norway maples have beautiful foliage, but in some towns in the southwestern portion of the state, they have replaced our native Sugar maples as the dominant forest tree. They are spreading from people's yards into our forests here.

Another problem species, Glossy Buckthorn, was originally grown in town as a medicinal species. Articles from the Greenfield Recorder-Gazette document its presence in Warwick as early as 1932. Recent research has shown that buckthorn species contain a chemical that is not only toxic to other plants (allelopathic), but also is toxic to animals that eat it or otherwise contact it. The only portion of these plants which isn't toxic is the ripe berries, which can be easily spread by birds to other locations. These plants are often found near wetland areas and fallen leaves and branches have been demonstrated to be toxic to salamanders and frogs.

There are several other non-native invasive species in Massachusetts which are not known in Warwick, including aquatic species. Some species occur in towns neighboring ours and thus are likely to occur within Warwick's boundaries in the near future.

The best way to control these species escaping into the natural ecosystems is to avoid planting them in our yards. Once established in the natural landscape, small infestations are more easily controlled than larger populations. Measures of control can include hand-pulling, but often herbicides are needed to stop their growth. Most are not easily controlled.

Non-native animals are also a concern. Introduced animals become a problem when they negatively affect the natural ecosystem. Non-native animal species include birds, fish, insects and earthworms.

Warwick has been affected in the past by the Gypsy moth which has denuded and damaged our oak trees, before the population peaked and crashed. Other non-native insects that are impacting natural resources in town now or may in the near future include the hemlock woolly adelgid, the elongate hemlock scale, Asian long-horned beetles, emerald ash borer, birch leaf-miner, beech bark disease, and maple thrips.

APPENDIX TO SECTION 4⁴⁹

General Description and Inventory of Wildlife and Wildlife Habitats

Warwick contains a large amount of upland and bottomland wildlife habitat. The forests of the Town consist of large unbroken tracts of dense forest that allow for good species movement within Warwick and the surrounding region. The Town still has a number of maintained fields and pasture areas, which provide an important ecological function for the maintenance of open land and edge species (those species that require this transitional zone for daily activities.)

Amphibians and Reptiles

Warwick's northern location and relatively high elevation puts it beyond the range of a number of the state's amphibians and reptiles. Our streams, wetlands, and forests coupled with low levels of development and traffic support healthy populations of several species. The current list of amphibians and reptiles observed in Warwick stands at seven species of frogs, six salamanders, five snakes, and five turtles. Warwick likely has about 30 species of amphibians and reptiles; hopefully this list will be filled out in the future.

Birds

The varied habitat of Warwick supports a great diversity of bird species, both summer residents and migrants as well as winter birds. At this writing the total bird list for the town stands at 95 species. However, compilation has been recent and partial; many additions are expected over the next several years. A town with abundant forest of various types, several substantial wetlands, many brooks, a dozen ponds both natural and man-made, and open pasture providing edge habitat can be expected to support ultimately a list nearing 160 species. Additions and information for changes of species status are encouraged and solicited.

Mammals

The town of Warwick is within the range of, or has appropriate habitat to support, approximately 52 species of mammals. Of these, the 25 species listed in the Appendix were reported. It is certain that more reports from experienced observers would greatly increase the number of species found in the town.

Notes on the Amphibian and Reptile Listings

⁴⁹ The first part of this appendix (pages 4-44 through 4-51) was prepared by the Species Space Cadets Subcommittee of the Warwick Open Space Plan Committee. The appendix also includes a letter from the Natural Heritage and Endangered Species Program (NHESP) dated May 11, 2009, which describes the rare species and other forms of biodiversity that NHESP has documented in the Town of Warwick. A list of Rare Species and Natural Communities Documented by NHESP in the Town of Warwick as of April 21, 2009 is also included.

The total list includes both species that have been detected in Warwick, as well as those whose range could fall within an area surrounding the town. In cases where actual detections have yet to be made, the spaces to the right of the species name are blank.

“C” stands for “common”: this species is more likely than not to be detected in the appropriate season and habitat.

“U” stands for “uncommon”: in the appropriate season and habitat, a concerted and/or repeated search may be needed to detect this species.

“R” stands for “rare”: only one to a few records for this species exist.

Locally common species are listed as “common” even though they may be detected in only a small area of the town.

Warwick Cumulative Amphibian and Reptile List 2009

Species	Abundance	Comments
Amphibians		
Bullfrog	C	
Gray treefrog	C	
Green frog	C	
Leopard frog, northern		
Pickerel frog	C	
Spring peeper	C	
Toad, American	C	
Toad, Fowler's		
Wood frog	C	
Blue-spotted salamander		
Dusky salamander, northern		
Four-toed salamander	R	Iverson conservation area
Jefferson salamander	R	Hastings Heights Road
Marbled salamander		unlikely for Warwick
Red-backed salamander, eastern	C	
Red-spotted newt	C	
Spotted salamander	C	
Spring salamander, northern		
Two-lined salamander	C	
Reptiles		
Black racer		
Black rat snake		

Species	Abundance	Comments
Brown snake		
Garter snake, common	C	
Green snake, smooth		
Hognose snake, eastern		
Milk snake, eastern	C	
Red-bellied snake	C	
Ribbon snake, eastern		
Ring-necked snake	C	
Watersnake, northern	C	
Box turtle, eastern		unlikely for Warwick
Musk turtle, eastern	R?	1909 record from Moores Pond, also a record from Orcutt Brook
Painted turtle, eastern	C	
Snapping turtle	C	
Spotted turtle	R	
Wood turtle	U	

Notes on the Bird Listings

The total list includes both birds that have been detected in Warwick, as well as those whose normal range or migration routes include the Warwick area. In cases where actual detections have yet to be made, the spaces to the right of the species name are blank.

“C” stands for “common”: this species is more likely than not to be detected in the appropriate season and habitat.

“U” stands for “uncommon”: in the appropriate season and habitat, a concerted and/or repeated search may be needed to detect this species.

“R” stands for “rare”: only one to a few records for this species exist.

Locally common species are listed as “common” even though they may be detected in only a small area of the town, e.g. purple martins may be found in numbers over a field in which there is a maintained martin house, but nowhere else. Irruptive winter birds such as pine siskins are estimated by their frequency during irruptions even though they may be absent on other years. The categories do not represent the frequency with which any species may be found outside of Warwick.

Summer occurrence does not necessarily assume nesting. Some summer listings may be unmated birds, fly-overs, hunting visitors or accidentals.

Warwick Cumulative Bird List 2009

Species	Summer	Migration only	Winter	Comments
Bittern, American	U			Bass Swamp; Moores Pond
Bittern, least				Moores Pond
Blackbird, red-winged	C			
Blackbird, rusty				
Bluebird, eastern	U			
Bobolink	U			
Bufflehead		U		
Bunting, indigo	U			
Cardinal, northern	C		C	
Catbird, gray	C			
Chickadee, black-capped	C		C	
Cormorant, double-crested		U		
Cowbird, brown-headed	C			
Crane, sandhill		R		1 record: Bass Swamp spring 08
Creeper, brown	C		C	
Crow, American	C		C	
Cuckoo, black-billed				
Cuckoo, yellow-billed	U			
Dove, mourning	C		C	
Dove, rock	C		C	
Duck, American black	U			
Duck, Mallard	C			
Duck, ring-necked				
Duck, wood	C			
Eagle, bald	U			
Falcon, peregrine				
Finch, house	C			
Finch, purple	C		U	
Flicker, northern	C			
Flycatcher, alder				
Flycatcher, great crested	C			
Flycatcher, least	C			
Flycatcher, olive-sided		U		
Flycatcher, willow				
Gnatcatcher, blue-gray	U			
Goldeneye, common				
Goldfinch, American	C		C	
Goose, Canada	C			
Goshawk, northern	U			
Grackle, common	C			
Grebe, pied-billed				
Grosbeak, evening	U		C	Breeds most years at Beech Hill
Grosbeak, pine			U	
Grosbeak, rose-breasted	C		C	
Grouse, ruffed	C		C	
Harrier, northern				
Hawk, broad-winged	C			

Species	Summer	Migration only	Winter	Comments
Hawk, Cooper's	U			
Hawk, red-shouldered	U			
Hawk, red-tailed	C			
Hawk, sharp-shinned		U		
Heron, great blue	C			
Heron, green				
Hummingbird, ruby-throated	C			
Jay, blue	C		C	
Junco, dark-eyed	U		C	
Kestrel, American	U			
Killdeer				
Kingbird, eastern	C			
Kingfisher, belted	C			
Kinglet, golden-crowned			C	
Kinglet, ruby-crowned		C		
Martin, purple				
Meadowlark, eastern				
Merganser, common		U		
Merganser, hooded	C			
Merlin				
Mockingbird, northern	C		C	
Nighthawk, common		U		
Nuthatch, red-breasted	C			
Nuthatch, white-breasted	C		C	
Oriole, Baltimore	C			
Osprey	U			
Ovenbird	C			
Owl, barred	C		C	
Owl, eastern screech			U	
Owl, great horned			U	
Owl, long-eared				
Owl, northern saw-whet				
Parula, northern		U		
Pewee, eastern wood	C			
Pheasant, ring-necked	U			
Phoebe, eastern	C			
Rail, Virginia				
Raven, common	C		C	
Redpoll, common			U	
Redstart, American	C			
Robin, American	C		U	
Sandpiper, solitary				
Sandpiper, spotted	C			
Sapsucker, yellow-bellied	C			
Shrike, northern			U	
Siskin, pine			C	
Snipe, Wilson's				

Species	Summer	Migration only	Winter	Comments
Sora				
Sparrow, chipping	C			
Sparrow, field				
Sparrow, house	C		C	
Sparrow, savannah				
Sparrow, song	C		C	
Sparrow, swamp				
Sparrow, tree			C	
Sparrow, vesper				
Sparrow, white-throated	U		C	
Starling, European	C		C	
Swallow, bank				
Swallow, barn	C			
Swallow, cliff				
Swallow, rough-winged				
Swallow, tree	C			
Swift, chimney	U			
Tanager, scarlet	C			
Teal, blue-winged				
Teal, green-winged				
Thrasher, brown	U			
Thrush, Bicknell's				
Thrush, gray-cheeked				
Thrush, hermit	C			
Thrush, Swainson's				
Thrush, wood	C			
Titmouse, tufted	C		C	
Towhee, eastern	C			
Turkey, wild	C		C	
Veery	C			
Vireo, blue-headed	C			
Vireo, Philadelphia				
Vireo, red-eyed	C			
Vireo, yellow-throated				
Vulture, turkey	C		C	
Warbler, bay-breasted				
Warbler, black and white	C			
Warbler, blackburnian	C			
Warbler, blackpoll				
Warbler, black-throated blue	C			
Warbler, black-throated green	C			
Warbler, blue-winged				
Warbler, Canada	U			
Warbler, Cape May				
Warbler, chestnut-sided	C			
Warbler, magnolia	U			
Warbler, Nashville	U			

Species	Summer	Migration only	Winter	Comments
Warbler, palm		C		
Warbler, pine	C			
Warbler, prairie				
Warbler, Tennessee				
Warbler, Wilson's				
Warbler, yellow	C			
Warbler, yellow-rumped	C			
Waterthrush, Louisiana	C			
Waterthrush, northern	U			
Waxwing, Bohemian			U	
Waxwing, cedar	C		C	
Whip-poor-will	U			
Woodcock, American	U			
Woodpecker, downy	C		C	
Woodpecker, hairy	C		C	
Woodpecker, pileated	C		C	
Woodpecker, red-bellied	U		U	
Wren, Carolina				
Wren, house	C			
Wren, winter	U			
Yellowlegs, greater				
Yellowlegs, lesser				
Yellowthroat, common	C			

Notes on the Mammal Listings

Species are listed in taxonomic rather than alphabetical order.

Evidence is either “obsv” or “t/s”. “Obsv” means that a direct visual observation was made in light and at a distance/duration for certainty. “t/s” means “tracks/sign”, i.e. some definite evidence of the presence of passage of a mammal was found other than direct observation. A listing in this category assumed sufficient skill at identification using these means on the part of the reporter.

Warwick Cumulative Mammal List 2009

Species	Evidence
Opossum, Virginia	obsv
Shrew, masked	
Shrew, water	
Shrew, smoky	
Shrew, short-tailed	
Mole, hairy-tailed	obsv
Mole, eastern	obsv
Mole, star-nosed	
Bat, little brown	
Bat, northern (long-eared)	
Bat, Indiana	
Bat, eastern pipistrelle	
Bat, big-brown	
Bat, red	
Bat hoary	
Cottontail, eastern	obsv
Cottontail, New England	1972 NHESP record
Hare, snowshoe	obsv
Chipmunk, eastern	obsv
Woodchuck	obsv
Squirrel, gray	obsv
Squirrel, red	obsv
Squirrel, southern flying	
Squirrel, northern flying	
Beaver	obsv
Mouse, deer	
Mouse, white-footed	obsv
Vole, southern red-backed	
Vole, meadow	obsv

Species	Evidence
Vole, woodland	
Muskrat	t/s
Lemming, southern bog	
Rat, Norway	
Mouse, house	
Mouse, meadow jumping	obsv
Mouse, woodland jumping	obsv
Porcupine	obsv
Coyote, eastern	obsv
Fox, red	obsv
Fox, gray	obsv
Bear, black	obsv
Raccoon	obsv
Fisher	obsv
Ermine (short-tailed weasel)	obsv
Weasel, long-tailed	obsv
Mink	
Skunk, striped	obsv
Otter, river	obsv
Bobcat	obsv
Deer, white-tailed	obsv
Moose	obsv



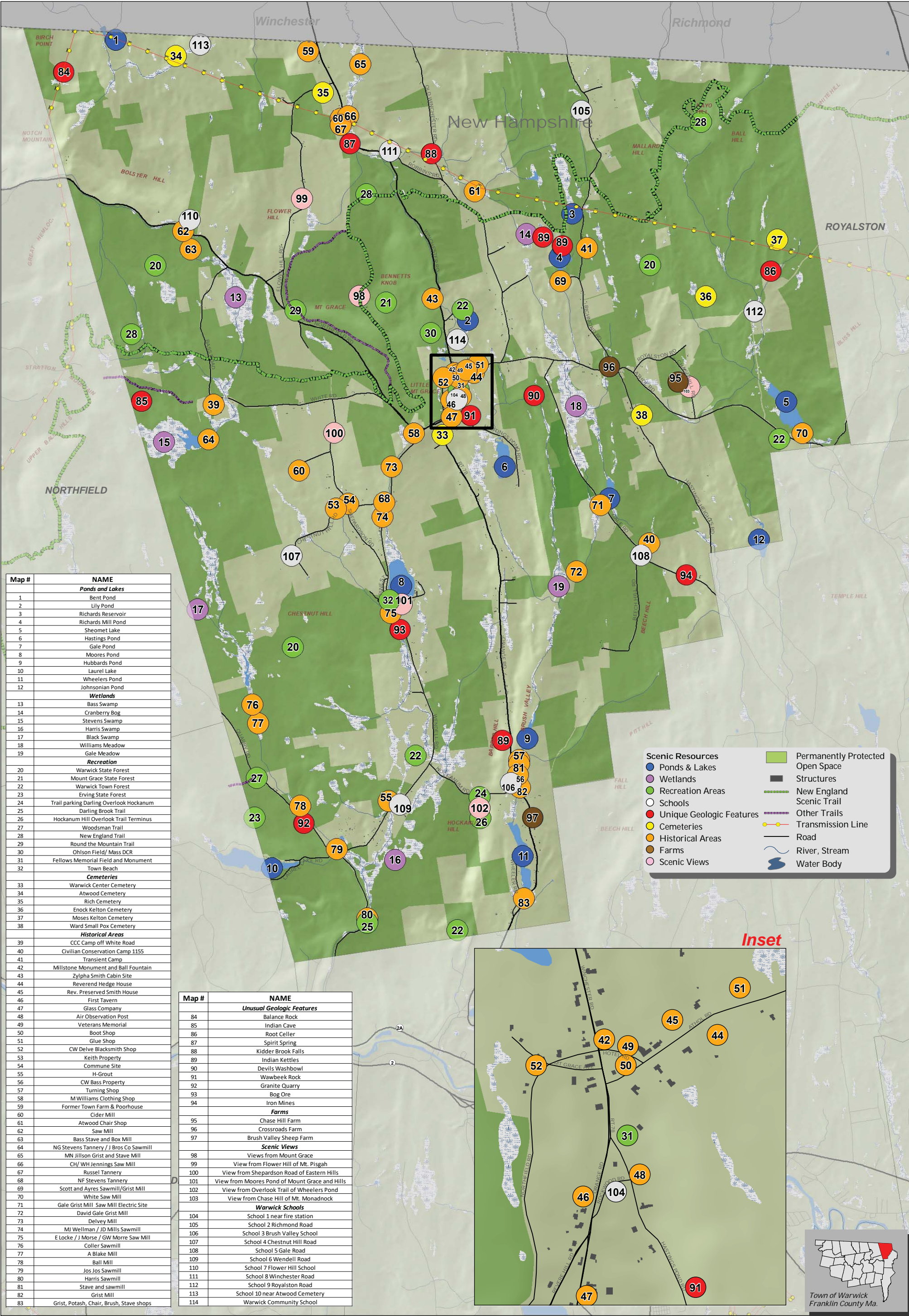
Town of Warwick
Open Space &
Recreation Plan 2020

January, 2020

Prime Farmland
Soils

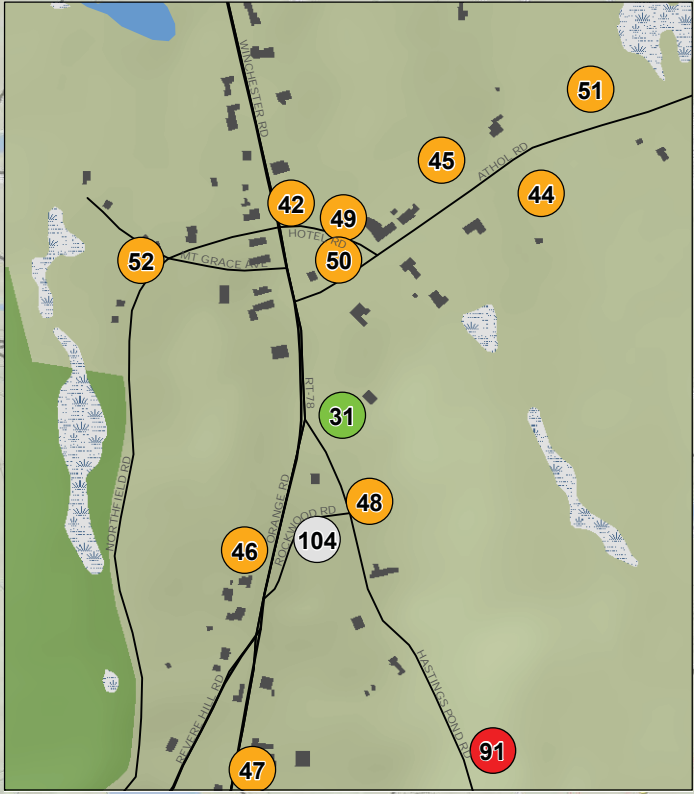
0 0.5 1 2 Miles





Map #	NAME
Ponds and Lakes	
1	Bent Pond
2	Lily Pond
3	Richards Reservoir
4	Richards Mill Pond
5	Sheomet Lake
6	Hastings Pond
7	Gale Pond
8	Moores Pond
9	Hubbards Pond
10	Laurel Lake
11	Wheeler's Pond
12	Johnsonian Pond
Wetlands	
13	Bass Swamp
14	Cranberry Bog
15	Stevens Swamp
16	Harris Swamp
17	Black Swamp
18	Williams Meadow
19	Gale Meadow
Recreation	
20	Warwick State Forest
21	Mount Grace State Forest
22	Warwick Town Forest
23	Erving State Forest
24	Trail parking Darling Overlook Hockanum
25	Darling Brook Trail
26	Hockanum Hill Overlook Trail Terminus
27	Woodsman Trail
28	New England Trail
29	Round the Mountain Trail
30	Ohlson Field/ Mass DCR
31	Fellows Memorial Field and Monument
32	Town Beach
Cemeteries	
33	Warwick Center Cemetery
34	Atwood Cemetery
35	Rich Cemetery
36	Enock Kelton Cemetery
37	Moses Kelton Cemetery
38	Ward Small Pox Cemetery
Historical Areas	
39	CCC Camp off White Road
40	Civilian Conservation Camp 1155
41	Transient Camp
42	Millstone Monument and Ball Fountain
43	Zylpha Smith Cabin Site
44	Reverend Hedge House
45	Rev. Preserved Smith House
46	First Tavern
47	Glass Company
48	Air Observation Post
49	Veterans Memorial
50	Boot Shop
51	Glue Shop
52	CW Delve Blacksmith Shop
53	Keith Property
54	Commune Site
55	H-Grout
56	CW Bass Property
57	Turning Shop
58	M Williams Clothing Shop
59	Former Town Farm & Poorhouse
60	Cider Mill
61	Atwood Chair Shop
62	Saw Mill
63	Bass Stave and Box Mill
64	NG Stevens Tannery / J Bros Co Sawmill
65	MN Jillson Grist and Stave Mill
66	CH/ WH Jennings Saw Mill
67	Russel Tannery
68	NF Stevens Tannery
69	Scott and Ayres Sawmill/Grist Mill
70	White Saw Mill
71	Gale Grist Mill Saw Mill Electric Site
72	David Gale Grist Mill
73	Delvey Mill
74	MJ Wellman / JD Mills Sawmill
75	E Locke / J Morse / GW Morre Saw Mill
76	Coller Sawmill
77	A Blake Mill
78	Ball Mill
79	Jos Jos Sawmill
80	Harris Sawmill
81	Stave and sawmill
82	Grist Mill
83	Grist, Potash, Chair, Brush, Stave shops

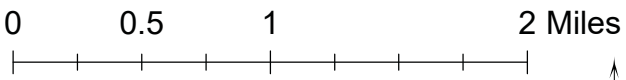
Map #	NAME
Unusual Geologic Features	
84	Balance Rock
85	Indian Cave
86	Root Celler
87	Spirit Spring
88	Kidder Brook Falls
89	Indian Kettles
90	Devils Washbowl
91	Wawbeek Rock
92	Granite Quarry
93	Bog Ore
94	Iron Mines
Farms	
95	Chase Hill Farm
96	Crossroads Farm
97	Brush Valley Sheep Farm
Scenic Views	
98	Views from Mount Grace
99	View from Flower Hill of Mt. Pisgah
100	View from Shepardson Road of Eastern Hills
101	View from Moores Pond of Mount Grace and Hills
102	View from Overlook Trail of Wheeler's Pond
103	View from Chase Hill of Mt. Monadnock
Warwick Schools	
104	School 1 near fire station
105	School 2 Richmond Road
106	School 3 Brush Valley School
107	School 4 Chestnut Hill Road
108	School 5 Gale Road
109	School 6 Wendell Road
110	School 7 Flower Hill School
111	School 8 Winchester Road
112	School 9 Royalston Road
113	School 10 near Atwood Cemetery
114	Warwick Community School



Town of Warwick Open Space & Recreation Plan 2020

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Scenic Resources & Unique Environments



Sources: Map produced by the Franklin Regional Council of Governments Planning Department. GIS data sources include MassDOT, MassGIS and FRCOG. Depicted boundaries are approximate and are intended for planning purposes only, not to be used for survey.



SECTION 5

INVENTORY OF LANDS OF CONSERVATION AND RECREATION INTEREST

A. INTRODUCTION

This section of the Warwick Open Space and Recreation Plan identifies parcels of undeveloped land that are individually, or in the aggregate, considered to be of interest because they help conserve wildlife habitat, scenic landscapes, the area's rural character, and current and potential recreational resources for Warwick's residents. Large areas of un-fragmented open space also provide ecosystem functions such as carbon sequestration, water filtration and flood protection, and corridors for plant and wildlife migration, all critical for mitigating and adapting to the impacts of a changing climate. Lands of conservation interest are those parcels of land that are considered important because they are already protected from development or because they could be a priority for protection.

When land is considered protected there is a legal restriction that does not permit the parcel to be developed for residential, commercial, or industrial uses. Permanently protected land enjoys the highest degree of protection from development. The only way that permanently protected land can be developed is if two thirds of the State legislature was to vote to change the use of the land as outlined in Article 97 of the Amendments to the Massachusetts State Constitution. In Massachusetts, there are a number of ways in which land can be considered permanently protected from development: a conservation restriction can be attached to the deed, or the land may be owned by a state conservation agency or non-profit conservation organization, a conservation land trust, or a municipal conservation commission. The "permanent protection" conveyed by Article 97 does have its limits. The state legislature has voted to release this protection at the request of local communities, so that conservation land can be used for schools, roads, economic development, or other public projects not related to resource protection.

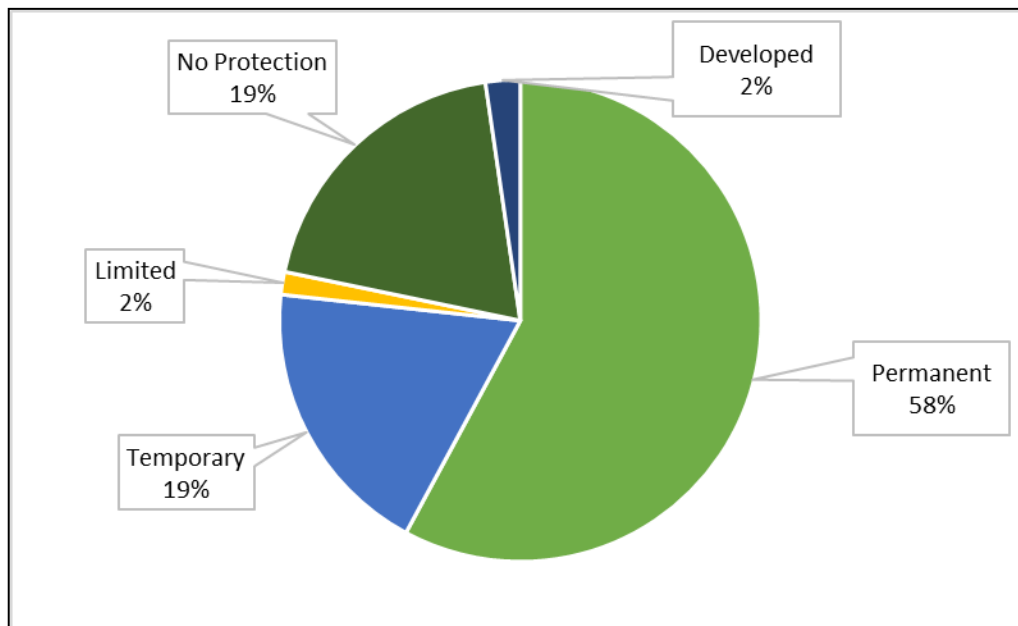
The inventory accompanied by the Open Space Map shows the location, types, and distribution of conservation lands in Warwick. This inventory is divided into two main sections based on type of ownership: 1) private (including non-profit conservation organizations) and 2) public. Within each of these major categories, parcels are differentiated by use (farm or forestland), by ownership, and by level of protection: permanent, limited, and temporary (*See Table 5-1 and Figure 5-1*). The change in acres since the last Warwick Open Space and Recreation Plan is also provided (*see Table 5-1 and Figure 5-2*).

Table 5-1: Summary of Protected Open Space in Warwick

PROTECTED OPEN SPACE	Area in Acres	Percentage of Warwick's Total Land Area (24,103 acres)	Change in Acres 2010 - 2019
PRIVATELY OWNED FARMLAND			
Permanently Protected	289.4	1.2%	0.0
Temporarily Protected under Ch. 61A	244.6	1.0%	41.0
Total Privately owned Protected Farmland	534.0	2.2%	41.0
PRIVATELY OWNED FORESTLAND			
Permanently Protected by Conservation Restriction	996.9	4.1%	0.0
Permanently Protected by Private Nonprofit Organizations	737.4	3.1%	0.0
Temporarily Protected under Ch. 61	3,641.4	15.1%	117.8
Temporarily Protected under Ch. 61B	687.6	2.9%	509.0
Total Private Owned Protected Forestland	6,063.4	25.2%	626.8
TOTAL PRIVATELY OWNED PROTECTED OPEN SPACE	6,597.3	27.4%	667.8
PUBLICLY OWNED FORESTLAND			
Permanently Protected by State Conservation Agencies	11,881.2	49.3%	204.2
Land Permanently Protected by Warwick Conservation Commission	44.6	0.2%	0.0
Land with Limited Protection by Town of Warwick	367.1	1.5%	88.0
TOTAL PUBLICLY OWNED OPEN SPACE	12,292.9	51.0%	291.8
TOTAL PROTECTED OPEN SPACE	18,890.2	78.4%	959.5
TOTAL PERMANENTLY PROTECTED OPEN SPACE	13,949.5	57.9%	203.8
TOTAL OPEN SPACE WITH TEMPORARY PROTECTION	4,573.6	19.0%	667.8
TOTAL OPEN SPACE WITH LIMITED PROTECTION	367.1	1.5%	88.0

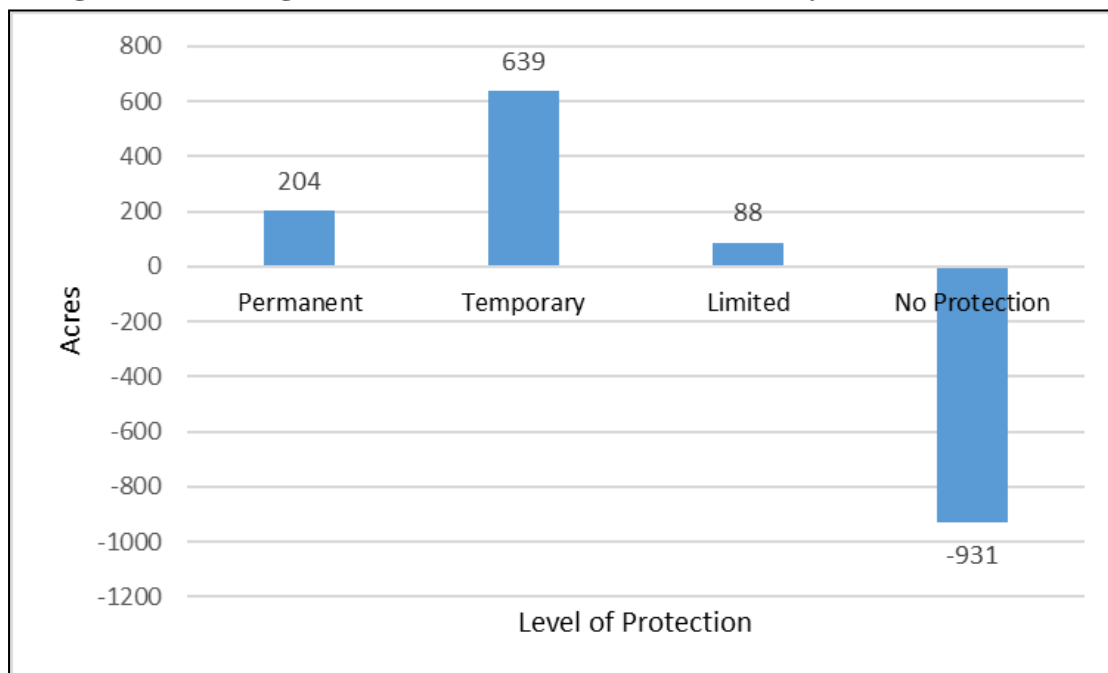
Source: Warwick Assessors Records and Maps, FY2019.

Figure 5-1: Land in Warwick by Level of Protection



Source: Warwick Assessor Records FY2019; 2005 MassGIS Land Use data.

Figure 5-2: Change in Acres in Warwick, 2010 – 2019, by Level of Protection



Source: Warwick Assessor Records FY2019; 2005 MassGIS Land Use data.

Permanent Protection

The parcels that are considered permanently protected are owned by the Commonwealth of Massachusetts and under the management of two state conservation agencies, the Department of Conservation and Recreation (DCR) and the Division of Fisheries and Wildlife (MassWildlife). Permanently protected parcels also include those that are under the authority of the Warwick Conservation Commission and those owned by private conservation land trusts like Mount Grace Land Conservation Trust (MGLCT). In addition, parcels owned by private citizens who have sold or donated their development rights to the state, a land trust, or other conservation organization also are permanently protected. These privately-owned lands are protected through either a conservation restriction or agricultural preservation restriction, attached to the property deed. Land that is permanently protected from development in one of these ways is protected under Article 97, which requires a two-thirds majority vote of the State Legislature to convert the open space to another use. Currently 58 percent of land in Warwick, roughly 13,950 acres, are permanently protected from development.

Permanent Protection of Farmland

Farmland can become permanently protected from development when the landowner sells the development rights for a parcel to a land trust or state agency. The Massachusetts Department of Agricultural Resources (MDAR) purchases the development rights of farmland in Franklin County regularly through their Agricultural Preservation Restriction (APR) Program. The program offers to pay farmland owners the difference between the "fair market value" and the "agricultural value" of their farms in exchange for a permanent deed restriction which precludes any use of the property that will have a negative impact on its agricultural viability.¹ The APR program requires a local match for the program that can come from any combination of three sources: the municipality, a non-governmental organization such as a land trust, and from a bargain sale conducted by the landowner. The local match requirement is 20 percent, however this percent is reduced if the town has implemented certain policies, including establishing an Agricultural Commission and adopting a Right-to-Farm bylaw, which Warwick has done. Currently there is one Warwick farm in the APR program: Chase Hill Farm.

Temporary Protection

Parcels enrolled in Massachusetts Chapter 61 (forestry), 61A (agriculture) and 61B (open space/recreation) tax programs are considered to be "temporarily protected" from development. This program offers landowners reduced local property taxes in return for maintaining land in productive forestry, agricultural or recreational use, or in a wild condition, for a period of time. These "chapter lands" provide many public benefits from maintaining wildlife habitat and recreational open space to sustaining rural character and local forest and farm-based economic activity. Following are details on each program.²

¹ <https://www.mass.gov/service-details/apr-program-objectives-benefits>. Accessed April 25, 2019.

² More information can be found on the UMass Extension's MassWoods website: <https://masswoods.org/landowner-programs/chapter-61-current-use-tax-programs>

Chapter 61 - Forestry:

Intended for landowners interested in long-term, active forest management. Assessment of forestland under Ch. 61 is based on the land's ability to grow timber. Program requirements include: 10 or more contiguous acres, a state-approved forest management plan developed by a licensed forester or landowner, and periodic forest management as recommended by the forest management plan. Landowners must renew their Ch. 61 enrollment every ten years with the local assessor's office.

Chapter 61A - Agriculture:

Intended for landowners engaged in agricultural or horticultural use. Assessment is based on the land's ability to produce the agricultural or horticultural product being grown. There is a 5 acre minimum to enroll land in Ch. 61A. Forestland may be enrolled in this program and is based on the land's ability to grow timber. Assessments and program requirements for Ch. 61A forestland are the same as they are in the Ch. 61 program. Landowners must renew their Ch. 61A enrollment annually with the local assessor's office.

Chapter 61B – Open Space and Recreation:

Intended for landowners interested in maintaining the land in a substantially natural, wild or open condition. Assessment of forestland under Ch. 61B is 25% of the current assessed value of the land. Landowners must have at least 5 contiguous acres of land. Land does not have to be open to the public. Forest management under Ch. 61B is not mandated. However, landowners do have the option of managing their forests if they develop a state approved forest management plan. Landowners must renew their Ch. 61B enrollment annually with the local assessor's office.

Another benefit of the Chapter 61 programs is that they offer towns the opportunity to protect land. When a parcel that has been enrolled in one of the Chapter programs is proposed for conversion to a use that would make it ineligible for the program, the town is guaranteed a 120-day waiting period during which it can exercise its right of first refusal to purchase the property. After a Purchase and Sale Agreement has been signed, the municipality has ninety days to complete the purchase if it elects to buy the property (or assign the right). The right of first refusal can be sold to, or given to, a land trust that can often respond much more quickly than the Town can.

A landowner with land enrolled in one of these programs is somewhat constrained from selling and/or developing his or her land by the Town's capacity to act on its right of first refusal. The Town would likely be much more successful in taking advantage of this opportunity if officials partnered with DCR, MassWildlife, New England Forestry Foundation (NEFF), and MGLCT staff. Often private conservation land trusts have the ability to produce creative and successful fundraising campaigns in a short period of time, while DCR and MassWildlife may be interested in purchasing the land in the near future. Often this negotiating process between the land trust, a state conservation agency, and the landowner can be completed in a shorter period of time than if the Town were to bring the decision to purchase the land to a Special Town Meeting. The Town can work on these relationships ahead of time so that it is able to assign its right of first refusal to the land trust as soon as the landowner expressed interest in selling the land to a developer.

Currently 19 percent of land in Warwick, or roughly 4,545 acres, are enrolled in one of the Chapter 61 programs and are considered to have temporary protection from development.

Limited Protection

Land considered to have limited protection includes any Town-owned open space, not under the authority of the Conservation Commission, which could be developed through a decision by the Select Board or by Town Meeting vote. The Town-owned open space is in the form of forestland, a cemetery, school yards, and the Town Common, and comprise roughly 1.5 percent of land in Warwick, or 367 acres. Of all the types of Town-owned public open space in Warwick, the cemetery and the Common are by far the best-maintained, park-like environments. All of the Town-owned lands are considered to have limited protection from development with the exception of two forested parcels recently acquired for conservation and passive recreation purposes that are under the authority of the Warwick Conservation Commission, which are fully protected.

Open Space Map

The Open Space Map shows that there are many possible linkages that could be made between existing permanently protected lands. The lands between these large blocks of protected land are likely to be owned by private citizens. Being able to help interested landowners in selling and or protecting parcels that would create links and corridors may be dependent on the Town's ability to work quickly with a number of potential land or conservation restriction buyers. It would benefit the Town to formalize working relations with DCR, MassWildlife, NEFF, and MGLCT, given these organizations' continued interest in protecting large greenways between the North Quabbin Region and the Connecticut River Valley.

The Open Space Committee has followed up on the 2002 Open Space and Recreation Plan's recommendation that the Town build a working relationship with DCR, DFW, NEFF, MGLCT, and Mass Audubon. These relationships, initiated by the Open Space Committee, have been very helpful in facilitating several successful conservation projects during the past fifteen years. Between 2002 and 2004, the Open Space Committee worked with the Mount Grace Land Conservation Trust to raise funds to purchase three parcels of land totaling 36 acres on Hockanum Road. In 2007, an 8.8 acre parcel was purchased entirely with private donations. Most recently, in 2017, the Town secured funding through the State Environmental Bond Bill to purchase 88 acres adjacent to the original 1925 Town Forest Reservation parcels. A total of 132.8 acres have been added to the Warwick Town Forest, which now encompasses 364.8 acres, through these recent efforts of the Open Space Committee.³

One way the Town could network with all these groups quite efficiently is by continuing to be involved with the North Quabbin Regional Landscape Partnership (NQRLP). The North Quabbin Regional Landscape Partnership is a voluntary organization of state and local organizations that seek to protect the ecological, cultural, and historical resources in the region

³ "Town of Warwick, MA Forestlands" booklet, November 2017. Compiled by George Day Jr., Warwick Open Space Committee.

through collaborative conservation planning. In 2005, the NQRLP received funding to hire its first coordinator and also to offer a small grants program. Warwick's Hockanum Hill Project received a \$4,000 grant from this source in 2006. The Partnership continues to be active and effective in facilitating conservation in the North Quabbin Region. Warwick has an excellent liaison with the Partnership because a member of the Open Space Committee serves on the NQRLP Executive Committee as a municipal representative.

B. PRIVATELY OWNED PARCELS

Although there is a great amount of open space owned by the state and by conservation organizations, the rest is owned by private individuals, both residents and non-residents, and associations or trusts, which are legal bodies, but not conservation land trusts. Some of the parcels are permanently protected from development due to the fact that the landowners have sold, or donated a portion of their property rights to a land trust, or a non-profit conservation organization. Others are temporarily protected from development through the Massachusetts Ch.61 Programs. The remaining privately owned lands are unprotected. They are discussed in this Open Space and Recreation Plan because most privately owned open space contains wildlife habitat, and some may provide unique recreational opportunities, or provide a potential connection between other permanently protected parcels. In some cases, unprotected parcels may be deemed valuable enough by the community to consider protecting. This would depend on the interest of the landowner and the ability of all parties to negotiate an acceptable price. These unprotected lands are discussed in general terms because a parcel level analysis of all parcels in Town is beyond the scope of this plan.

Private landowners together control approximately 27 percent of the protected open space in Warwick. Some of this land is in pasture but most is in forest. These open space parcels are still on the tax rolls and generating tax revenue for the town. Many landowners have taken advantage of the Chapter 61 programs as is evidenced by the fact that there are 4,574 acres of open space in the 61, 61A and 61B Programs combined (an increase of over 600 acres since the 2010 Open Space and Recreation Plan). As is mentioned earlier, the Ch.61 Programs offer the Town of Warwick an opportunity to purchase any Ch.61 property that is put up for sale.

In the following tables, Privately Owned Agricultural and Forest Lands are listed by level of protection from development. The ownership of the land is provided along with the assessors' map and lot number and acreage. The current use is based on the vegetation. Farmland may most likely be pasture in Warwick, while forest is presumed to be used as such, whether it is managed for timber or not. Public access on private land is not guaranteed and subject to change. State conservation agencies often require some level of public access before paying for, or accepting, conservation restrictions. Public access is not a requirement for enrollment in any of the Ch.61 programs including the Ch.61B Open Space and Recreation Program.⁴ Privately owned land that is unprotected may or may not allow public access. It is assumed that given the

⁴ Land enrolled in Ch. 61B as "recreational" must be open to the public or to members of a non-profit organization. "Open space" enrolled in Ch. 61B does not require public access.

nature of these open space parcels, access to them by people with disabilities is also not guaranteed.

The recreational potential for all of these privately owned parcels is identified in the "Recreation Value" column of the tables. Parcels that fail to have a significant recreation potential may have another characteristic identified in this column or none at all.

Important characteristics that could motivate the Town to consider acting on their right of first refusal for a Ch.61 parcel, or negotiating with a willing landowner for a fair purchase price, may include the presence of prime farmland soils, pasture, wetlands, a portion of the land that is above an aquifer, or rare or endangered species habitat. In addition, the parcel may be deemed very important as a link in a potential greenway or as a component of a very large block of contiguous forest.

B.1 Privately Owned Agricultural Land

According to the Warwick Assessor's records, there are 289 acres of agricultural land that are permanently protected in Warwick. There have been no additional acres of agricultural land permanently protected in Warwick since the 2010 Open Space and Recreation Plan. Most agricultural land that is protected from development in the region becomes so only after being prioritized by the State's Department of Agricultural Resources (DAR), which is the main source for farmland preservation funds in eastern Franklin County. The DAR normally requires the land to be actively farmed and to contain prime farmland soils.

All of the parcels in Table 5-2 are permanently protected from development and are currently used as agricultural land. The holder of the restriction is considered to be the same as the manager of the restriction. There are no public grants awarded, though the owner received payment for the restriction, which came from a state agency, the DAR. The zoning of the parcels is Rural-Agricultural. Most of the parcels have a high recreation value because of the presence of a trail easement, which connects the Iversen Conservation Area with the Warwick State Forest via Chase Hill Farm. These permanently protected agricultural fields also have high scenic value. The open pastures at the south end of Chase Hill Farm offer one of the most stunning views of Mt. Grace—particularly at sunset. The pastures at Chase Hill Farm provide handsome views of Mt. Monadnock to the northeast and Mt. Wachusett to the southeast.

Table 5-2: Privately Owned Agricultural Land Permanently Protected from Development

Map	Lot	Acres	Restriction Holder	Recreational/ Other Public Benefit
404	6	23.55	DAR	High-MGCLT trail easement
404	10.2	14.86	DAR	High-MGCLT trail easement
404	19	8.7	DAR	High-MGCLT trail easement
404	35.1	151	DAR	High-MGCLT trail easement
404	35.2	15	DAR	High-MGCLT trail easement

Map	Lot	Acres	Restriction Holder	Recreational/ Other Public Benefit
404	1	15.56	DCR	Low
404	37	7.7	DCR	Low
409	18	30	DAR	High-MGCLT trail easement
409	34	23	DAR	High-MGCLT trail easement
TOTAL		289.37		

Source: Warwick Assessor's Records and Maps, FY2019.

There are approximately 245 acres of farmland in the Ch.61A Program in Warwick, an increase of approximately 40 acres since the 2010 Open Space and Recreation Plan. All of this land is valuable as a potential source of food, as scenery, and as a contributor to the livelihood of Warwick residents. Some of the parcels are especially important because they contain unique values such as stream corridors, prime farmland soils, wetlands, and areas that have been identified as containing key wildlife habitats and plant communities. Other parcels contain recreational streams and are surrounded or abut large blocks of permanently protected forest.

All parcels in Table 5-3 are in the Ch.61A Program and the degree of protection of these parcels is short term. The owner is also the manager of the parcel with current use of the parcel being agriculture. There are no public grants awarded as a result of the Program, however, the owner does receive an annual tax break. The zoning of the parcels is Rural-Agricultural.

Table 5-3: Agricultural Land with Temporary Protection from Development through Enrollment in the Chapter 61A Land Classification and Taxation Program

Map	Lot	Acres
402	11	16
402	31.1	29
402	31.6	8.9
402	42.2	112
402	13	0.78
402	16	6.6
402	17	27.6
405	24	16
409	36	12.7
411	115	15
TOTAL		244.58

Source: Warwick Assessor's Records and Maps, FY2019.

Since the 2010 Warwick Open Space and Recreation Plan, the Town adopted a Right to Farm bylaw to help support agricultural uses in town. The 2016 Warwick Farmland Inventory prepared by the Mount Grace Land Conservation Trust identified 619 acres of active farm fields in Warwick being used for pasture or crop production. According to the inventory, 59 percent of these fields are not permanently protected from development. In addition to farm fields,

Warwick has a large amount of prime farmland soils, most of which is forested. The inventory states:

Warwick's farmland contributes to the regional economy and preserves Warwick's historic charm and rural character. Farmers in Warwick produce hay, beef, dairy, and other products, but there is potential to produce even more food and fodder by protecting the farmland that exists and selectively reclaiming underutilized or former farm fields. Conservation of Warwick's most important farms is a critical first step to achieving the goals of the town's Open Space Plan and expanding the Warwick's role in the regional food economy.⁵

The inventory includes suggested criteria for ranking farmland for conservation in Warwick. The Open Space Committee and Agricultural Commission can use the criteria to help identify potential parcels to target for protection.

B.2 Privately Owned Forested Land

Most natural processes do not follow political boundaries but ownership can impact the forest through development and management treatments. Across a regional landscape defined as the North Quabbin, development can impact the forest through fragmentation. Large blocks of contiguous forest form the basis for sustaining biological diversity in the region. The contiguous forestland in these communities help to provide interior forest habitats that are separate yet potentially connected to the very large interior forest habitats that exist within the Quabbin Reservation.

The following inventory includes privately owned forestland at different levels of protection from development. Permanently protected forestland exists when landowners have donated or sold their development rights to a state conservation organization or a land trust. The landowners retain the other rights of ownership and they continue to pay property taxes, though the taxes will be less due to the reduced value of their land. Forestland that is considered temporarily protected from development includes those lands enrolled in the Ch.61 and 61B Programs.

There are approximately 997 acres in Warwick (See Table 5-4) that are permanently protected from development and privately owned. The owners are also considered to be the managers of the parcels with their current use being forest. The holder of the restriction, DCR, MassWildlife, MGLCT and Mass Audubon are also considered to be the manager of the restriction. There were no public grants awarded, though the owner may have received payment for the restriction, which came from a public source. One of the restrictions was donated by the landowner to the restriction holder. The zoning of the parcels is Rural-Agricultural.

⁵ "Warwick Farmland Inventory Fact Sheet," prepared for the Town of Warwick in May 2016 by Mount Grace Land Conservation Trust with support from the Henry P. Kendall Foundation and the Massachusetts Land Initiative for Tomorrow (MassLIFT-AmeriCorps).

Several of these parcels were protected through the “Tully Initiative.” This was an historic and unprecedented landscape scale open space conservation project initiated by the Massachusetts Executive Office of Energy and Environmental Affairs (EEA) and administered by Mount Grace Land Conservation Trust from 2000 – 2002. Ninety parcels of land across multiple communities were protected through purchasing the fee interest or conservation restrictions at an expenditure of \$9 million. The conservation restrictions purchased from private landowners in this initiative contained public access requirements. In addition, because the focus by EEA agencies has been to expand the value of existing permanently protected open space, most of the parcels listed in Table 5-4 create links between existing blocks of forestland.

Table 5-4: Privately Owned Forestland Permanently Protected from Development

Map	Lot	Acres	Holder of Conservation Restriction
402	32	22	DCR
402	46	181	DCR
403	14.2	123.91	MGLCT
405	82	15	MGLCT
406	12	90.67	DCR
406	17	26.76	DCR
409	15.2	11.97	MGLCT
409	32	140	DCR
409	35.2	36.63	MGLCT
411	116	49	Mass Audubon
410	3	62	DCR
411	128	238	DCR
TOTAL		996.94	

Source: Warwick Assessor's Records and Maps, FY2019.

All of the parcels in Table 5-5 are in the Ch.61 Forestland Classification and Taxation Program and the degree of protection of these parcels is short term. The owner is also the manager of the parcel with current use of the parcel being forest. There are no public grants awarded as a result of the Program, however, the owner does receive a property tax break over a ten-year period. The zoning of the parcels is Rural-Agricultural.

The following parcels together comprise 15 percent of the total land area of Warwick and 19 percent of all of the protected open space in Town. Since the 2010 Open Space and Recreation Plan, there has been an increase of approximately 118 acres of land enrolled in the program. Looking at open space as a means for wildlife species to move across the landscape, Ch. 61 lands provide important linkages between the State Forest blocks in Warwick, Northfield and Royalston and across the region from the New Hampshire border to the Quabbin Reservation. Ch.61 lands contain prime farmland soils, significant historical agricultural landscapes, and core habitat areas. These lands also buffer wetlands and historical impoundments and they provide a compelling reason for some landowners to keep their lands in forest – periodic income generated by timber harvests and the satisfaction gained from working the land.

Table 5-5: Forestlands with Temporary Protection from Development through Enrollment in the Chapter 61 Forestland Classification and Taxation Program

Map	Lot	Acres
401	4	45
401	8	43
401	9	737.7
401	11	47
401	13	17.21
401	26	90
402	20	62.2
402	22	69.09
402	25	19
402	26	15
403	3	20
403	6	10.6
403	7	45
403	8	9.3
403	11	12.4
404	8	18.37
404	11.1	27.53
404	11.2	24.67
404	16	30
405	24	28.5
405	38.1	22.847
405	67	15
405	70	124
405	71	65
405	86	18
405	87	2
406	1	50.89
406	2	46.81
406	3	26
406	4	25.3
406	6	15
406	10	33.59
406	16	50.42
406	23	10
406	24.1	24.01
406	24.2	26.33
406	24.3	18.3
407	2	103.9
407	2.1	2.4
407	2.2	17
407	2.3	44.5
407	3	21

Map	Lot	Acres
408	4	12.7
408	10	43
408	11.2	28.27
408	42	111
408	48	17
408	50	16
408	51	35
408	53.2	0.63
408	53.3	4
408	54	24.2
408	55	4
408	56	39
408	56.1	16
408	61	54.6
408	62	17
408	63	5.5
408	69	31.14
408	71	3
408	113	47
408	125	32
408	132	46.7
409	9	24.36
409	22	2.7
409	31	101.7
409	37	39
409	38	63
409	43	29
409	45	19
410	1	22
410	6	124
410	8	78.1
411	4.1	174
411	83	88
414	51.1	8.67
414	56	8.61
414	56.3	17.12
414	56.4	18.79
414	57.6	17.346
414	58	10.4
414	59	74
TOTAL		3,641.40

Source: Warwick Assessor's Records and Maps, FY2019.

All of the parcels in Table 5-6 are in the Ch.61B Recreational Open Space Lands Classification and Taxation Program and the degree of protection of these parcels is short term. Land enrolled in Ch.61B increased by over 500 acres since the 2010 Open Space and Recreation Plan. The owner is also the manager of the parcel with current use of the parcel being open space. There are no public grants awarded as a result of the Program, however the owner does receive a tax break over a ten-year period. The zoning for these parcels is Rural-Agricultural. These Ch. 61B parcels contain core habitat areas, historical streams, and abut permanently protected open space. Although MGLCT owns a number of parcels that have been protected in the past under the Ch. 61B Program, these parcels are now listed as having permanent protection from development and are therefore listed in Table 5-9: Permanently Protected Parcels Owned by Public Non-Profit Agencies.

Table 5-6: Forestlands with Temporary Protection from Development through Enrollment in the Chapter 61B Recreational Open Space Lands Classification and Taxation Program

Map	Lot	Acres
401	2	3.5
401	3	32
402	28	45.5
402	37	38
402	40	8.1
402	41	2.3
404	22	50
404	24	39
405	74	63
405	76	6.35
406	18	12.02
406	25	116
407	4	33.66
407	5.2	11.2
408	124.2	28.258
409	3.1	83.9
412	3	16
414	19	9
414	50.1	20
414	50.2	18.48
414	50.3	25.89
414	51.3	7.49
414	54	18
TOTAL		687.65

Source: Warwick's Assessor's Records and Maps, FY2019.

C. NON-PROFIT PARCELS

Non-profit conservation land trusts and conservation organizations that also protect land as part of their mission are responsible for protecting much more land than what they actually own themselves. Mount Grace Land Conservation Trust (MGLCT) owns open space in-fee. It also protects land by purchasing the development rights to land from willing landowners. By holding these conservation restrictions, it keeps the land from being developed even though the parcels remain the property of the landowners. MGLCT also works with landowners interested in protecting their land from development. MGLCT facilitated the preservation of two Warwick farms (Chase Hill and Crossroads Farm⁶) by working with the landowners and the state agencies interested in their protection. A land trust can and often does negotiate with state agencies to find a potential buyer of the development rights. If the landowner is interested in selling their land in-fee, the land trust can often bring funding from many different sources, both public and private, to help in providing an acceptable price.

Land trusts also can assist towns by pre-acquiring land and holding it long enough for the town to find funding to purchase the land. Towns are limited in their ability to respond quickly when important open space parcels come on the open market (and also in Chapter 61 right of first refusal situations) because the town usually lacks an immediate source of funds and because it may be necessary to wait several months before the next Town Meeting at which residents can vote to approve the project. It requires many months and much hard work on the part of the Open Space Committee or Conservation Commission to apply for and receive the necessary grants to cover the cost of Town conservation land. Warwick's successful Hockanum Hill Project was possible only because MGLCT pre-acquired the 36 acres on behalf of the Town to allow time to apply for a Self-Help grant, several other grants, and also to do local private fundraising.

In Table 5-7, the parcels noted have not received any type of public grant. They are all zoned Residential-Agricultural and are protected under Article 97, which requires two-thirds majority vote of the State Legislature to convert open space to another use.

Table 5-7: Permanently Protected Parcels Owned by Private Non-Profit Agencies

Fee Owner	Site Name	Map	Lot	Area	Current Use	Recreation Value	Public Access
MGLCT	Charles Morse Memorial Forest	401	7	57	Forest	High, well used	Via Northfield State Forest
NEFF	Wallace Forest	401	10	85	Forest	High	Via Northfield State Forest
MGLCT	Song Land	401	22	81	Forest	Low	Via Flower Hill Road
MGLCT	Earle Land	408	93	94	Forest	High	Via Hastings Pond Road
MGLCT	Iversen Conservation	408	129	143	Forest	High	Via Gale Road

⁶ Crossroads Farm is now part of Chase Hill Farm.

Fee Owner	Site Name	Map	Lot	Area	Current Use	Recreation Value	Public Access
	Area (Iversen)						
MGLCT	Iversen	408	130	9.82	Forest	High	Via Gale Road
MGLCT	Iversen	408	131	23.93	Forest	High	Via Gale Road
MGLCT	Blackbird parcel	408	126	6.6	Wildlife habitat	Low	Via Gale Road
MGLCT	Earle Land	409	3.1	83.90	Forest	High	Via Gale Road
MGLCT	Iversen	409	5.1	59	Forest	High	Via Gale Road
MGLCT	Iversen	409	12	44	Forest	High	Via Gale Road
MGLCT	Iversen	409	13	24	Forest	High	Via Gale Road
MGLCT	Iversen	409	15.1	26.13	Forest	High	Via Gale Road
Total				737.38			

Source: Warwick Assessors' Records and Maps, FY2019.

D. PUBLIC PARCELS

State conservation agencies and the Town of Warwick own a significant portion of Warwick's land. Almost all of this land is permanently protected from development. The following inventory includes parcels that are owned by the Commonwealth of Massachusetts and the Town.

D.1 State-Owned Open Space

There are two agencies that manage the State owned lands: the Department of Conservation and Recreation (DCR) and the Division of Fisheries and Wildlife (MassWildlife).

DCR's lands are spread throughout the Town and are part of the Warwick and Mount Grace State Forests. These lands are categorized under three designations: parklands, woodlands, and reserves. Land under all three designations is considered permanently protected under Article 97. Each designation has its own set of services and management priorities (see Figure 5-2).

Parklands conserve unique natural and cultural resources while focusing on the provision of recreation, and include Laurel Lake, the picnic area and DCR building on Route 78, and the summit of Mount Grace. Woodlands conserve a range of ecosystem services, including production of local wood products, protection of water quality, carbon sequestration, and habitat diversity, and are located in the central and northern sections of Warwick. Reserves conserve large contiguous blocks of high-value ecosystems where the dominant objectives are biodiversity maintenance, nutrient cycling and soil formation, and long-term carbon sequestration. Forest reserves are located in the western and southern sections of Warwick and connect to State Forest Reserves in Orange and Wendell.⁷ State Forest designations are shown on the Regional Context map in Section 3.

Warwick State Forest encompasses most of the western and northeastern portions of Warwick. Mount Grace State Forest is roughly bounded by Flower Hill Road, Northfield Road and Old

⁷

Winchester Road and is located in north central Warwick. These lands are open to the public, free of charge and are the most commonly used recreational lands in Warwick. Residents and visitors use the trails in Mount Grace State Forest for hiking and cross country skiing. Formerly, the public also enjoyed the Mount Grace Picnic Area on Route 78 but due to a combination of lack of staff to maintain the area and the die-off and subsequent removal of the large sheltering pines, the picnic area became a less attractive destination. The area is currently in transition as a new forest grows to replace the diseased pines. Laurel Lake and Sheomet Lake are located in Warwick State Forest. These areas offer swimming and boating opportunities. Laurel Lake is in the southwestern corner of Warwick and Sheomet Lake is located off Athol and Tully Brook Roads in eastern Warwick. The State Forests in Warwick contain wetlands, stream corridors, and ponds.

MassWildlife lands are located in the eastern half of Warwick. The northernmost parcel located to the east of Richmond Road is surrounded by Warwick State Forest and MGLCT lands. This parcel has a portion of Tully Brook running through it. The parcel in southeastern Warwick is located off Brush Valley Road and has a tributary of Orcutt Brook running through it. MassWildlife lands are open to the public though normally the level of recreation facilities management is low. MassWildlife lands are managed for multiple uses but hunting and fishing enthusiasts are more likely to utilize these sites as they do not have as many established trails and facilities.

Figure 5-2: DCR State Parks and Forests Landscape Designation Management Guidelines

Landscape Designation Management Guidelines →	Reserve – <i>The least fragmented forested areas where ecological processes will predominate and inform management, and where commercial timber harvesting is not allowed.</i>	Woodland – <i>Forested areas actively managed for forest health, resource protection, sustainable production of timber, and recreation.</i>	Parkland – <i>Areas providing public recreation opportunities, connections to nature, and protection and appreciation of natural and cultural resources.</i>
Land Stewardship Zones ↓			
Zone 1 – <i>Highly sensitive resources requiring special management approaches.</i>	Rare species habitat, natural communities, archaeological sites, or fragile cultural sites identified as being sensitive to / easily degraded by human activities.		
Zone 2 – <i>Resources that support recreational and management activities appropriate to the site.</i>	Large areas of natural vegetation and associated natural and cultural features, including rare species habitat, that is compatible with dispersed recreation.	Forest stands and associated natural and cultural features, compatible with dispersed recreation and active forest management intended to enhance species and age class diversity.	Stable / hardy natural and cultural landscapes, where a variety of outdoor recreation activities can be provided in a sustainable manner.
Zone 3 – <i>Intensive use areas such as recreational sites or maintenance areas.</i>	<p>New zone 3s will not be established in Reserves.</p> <p><u>Exception</u>— an RMP may identify existing intensive use areas missed during designation and not already captured in a Parklands designation area, in which case the application of a zone 3 may be considered.</p>	Intensive recreation and park administration areas currently embedded within the forested landscape.	Areas that require regular maintenance by DCR staff, including altered landscapes in active use, intensive recreation areas, and park administration areas. Sites that may accommodate administrative or intensive recreation areas to meet future demands.

Source: Landscape Designations for DCR Parks & Forests: Selection Criteria and Management Guidelines. March 2012.

Table 5-8 lists permanently protected public parcels of land owned by the Commonwealth of Massachusetts. The listed parcels are managed either by DCR or by MassWildlife. Since the 2010 Open Space and Recreation Plan, DCR acquired an additional 204 acres in Warwick.

Table 5-8: Permanently Protected Land in Warwick by State Conservation Agencies

Property Manager	Site Name	Map	Lot	Area	Current Use	Condition	Recreation Value	Public Access
DCR	Warwick State Forest	401	1	24	Hunting, Hiking, Horseback Riding	Good	High	Via Northfield Road
DCR	Northfield State Forest	401	5	43	Hiking, Horseback Riding, water supply protection	Good	High	Birnam Road in Northfield
DCR	Northfield State Forest	401	6	34	Hiking, Horseback Riding, water supply protection	Good	High	Birnam Road in Northfield
DCR	Warwick State Forest	401	19	234	Hunting, Horseback Riding	Good	High	Via Flower Hill Road
DCR	Warwick State Forest	401	24	71	Hunting, Horseback Riding	Good	High	Via Flower Hill Road
DCR	Sliva Land	402	3	17	Hunting	Good	High	Via Winchester Road
DCR	Mt. Grace State Forest	402	4	225	Hunting, Hiking, Snowmobiling, XC Skiing	Good	High	Via Winchester Road
DCR	Mt. Grace State Forest	402	5	1,146	Hunting, Hiking, Snowmobiling, XC Skiing	Good	High	Via Winchester Road
DCR	Sliva Land	402	6	3	Hunting	Good	High	Via Winchester Road
DCR	Warwick State Forest	403	1	524	Hunting	Good	High	Via Richmond Road
DCR	Warwick State Forest	403	4	75	Hunting	Good	High	Via Smith Road
DCR	Warwick State Forest	403	9	78	Hunting	Good	High	Via Smith Road
DCR	Warwick State Forest	403	10	77.88	Hunting	Good	High	Via Smith Road
DFW	Warwick State Forest	403	19	77	Hunting	Good	High	Difficult, Through WSF off Smith Road
DCR	Warwick State Forest	403	20	108	Hunting	Good	High	Through WSF
DCR	Warwick State Forest	404	15	553	Hunting	Good	High	Via Richmond Road
DCR	Warwick State Forest	404	18.2	36.04	Hunting	Good	High	Via Richmond Road
DCR	Warwick State Forest	404	18.5	27.67	Hunting, Hiking, XC Skiing, Snowmobiling	Good	High	Via The Ridge Road
DCR	Warwick State Forest	404	20	70	Hunting	Good	High	Via Royalston Road
DCR	Warwick State Forest	404	26	736.1	Hunting	Good	High	Via Royalston Road
DCR	Warwick State	404	29	270	Hunting	Good	High	Via Athol Road

Property Manager	Site Name	Map	Lot	Area	Current Use	Condition	Recreation Value	Public Access
	Forest							
DCR	Mt. Grace State Forest	405	25	0.01	Hunting, Hiking, Snowmobiling, XC Skiing, Horseback Riding	Good	High	Off Mt. Grace Ave.
DCR	Warwick State Forest	406	7	3043	Hunting, Horseback Riding	Good	High	Via Northfield & Bass Roads
DCR	Warwick State Forest	406	8	19	Hunting, Horseback Riding	Good	High	Via Northfield Road
DCR	Warwick State Forest	407	6	541	Hunting	Good	High	Via White Road
DCR	Warwick State Forest	408	5	57	Hunting, Horseback Riding	Good	High	Via Orange Road
DCR	Warwick State Forest	408	76	127	Hunting, Horseback Riding	Good	High	Via Northfield Road
DCR	Warwick State Forest	409	1	419	Hunting, Horseback Riding	Good	High	Via Gale Road
DCR	Warwick State Forest	409	3.1	34.54	Wildlife Viewing, Hunting, Horseback Riding	Good	High	Via Gale Road
DCR	Warwick State Forest	409	5.2	73.87	Wildlife Viewing, Hunting, Horseback Riding	Good	High	Via Gale Road
DCR	Warwick State Forest	409	7	171	Hunting, Horseback Riding	Good	High	Via Gale Road
DCR	Warwick State Forest	409	23	63	Hunting, Horseback Riding	Good	High	Via Athol Road
DCR	Warwick State Forest	409	24	2.3	Hunting, Horseback Riding	Good	High	Via Athol Road
DCR	Warwick State Forest (Sheomet Lake)	409	25	496	Swimming, Fishing, Picnicking, Wildlife Viewing, Horseback Riding	Good	High	Via Tully Brook & Athol Roads.
DCR	Warwick State Forest	409	27	0.76	Recreation, Horseback Riding	Good	High	Via Bliss Hill Road
DCR	Warwick State Forest	409	28	5.8	Recreation, Horseback Riding	Good	High	Via Bliss Hill Road
DCR	Warwick State Forest	409	30	74	Hunting, Horseback Riding	Good	High	Via Athol Road
DCR	Warwick State Forest	410	5	26	Hunting	Good	High	Via Beech Hill Road
DCR	Dubeau Land	410	10.01	30	Hunting	Good	High	Via Gale Road
DCR	Warwick State Forest	410	11	108	Hunting	Good	High	Via Beech Hill Road
DCR	Warwick State Forest	410	12	22	Hunting	Good	High	Via Beech Hill Road
DCR	Warwick State Forest	410	13	52	Hunting	Good	High	Via Beech Hill Road
DFW	Warwick State	410	14	112	Hunting	Good	High	Via Beech Hill

Property Manager	Site Name	Map	Lot	Area	Current Use	Condition	Recreation Value	Public Access
	Forest							Road
DFW	Warwick State Forest	411	5.1	95.6	Hunting	Good	High	Via Wilson Road and Wendell Road
DFW	Warwick State Forest	411	12	10.8	Hunting	Good	High	Via Wilson Road
DCR	Warwick State Forest	411	44	2.49	Hunting	Good	High	Via Wendell Road
DCR	Warwick State Forest	411	102	397	Hunting	Good	High	Via Wendell Road
DCR	Warwick State Forest	412	4	39	Wildlife Viewing, Hunting	Good	High	Via Quarry Road
DCR	Warwick State Forest	412	5	52	Hunting	Good	High	Via Quarry Road
DCR	Warwick State Forest (Laurel Lake)	413	1	846	Fishing, Picnicking, Swimming, Boating, Ice Skating, Camping	Good	High	Via Quarry & Wendell Roads
DCR	Warwick State Forest	414	18	456	Hunting	Good	High	Via Hockanum Road
DCR	Warwick State Forest	414	23	26	Hunting	Good	High	Off Wendell Road
DCR	Warwick State Forest	414	30	4.3	Hunting	Good	High	Via Wendell Road
DCR	Warwick State Forest	415	2	45	Hunting	Good	Fair	Difficult
Total				11,881.16				

Source: Warwick Assessors' Records and Maps, FY2019.

D.2 Land Owned by the Town of Warwick

The Town of Warwick owns 44.6 acres of permanently protected open space. This land consists of forested parcels acquired through the initiative of the Warwick Open Space Committee (WOSC). The WOSC was established in 2002 to fulfill one of the action steps recommended by the Town's 2002 Open Space and Recreation Plan. The following parcels are under the authority of the Conservation Commission, and are considered permanently protected from development.

Hockanum Hill Conservation Area

The first parcel was purchased in 2004 with the assistance of a Self-Help grant provided by the State's Division of Conservation Services. The 36-acre property is located in south Warwick on Hockanum Road at the north end of Hockanum Hill. The purpose of the project was to permanently protect public access to the existing trail leading to a former "overlook", and also to preserve the undeveloped character of the Barber Hill and Hockanum Hill ridgeline. This green corridor comprised mostly of large, permanently protected tracts of Warwick and Orange State Forest, runs for six miles north-to-south from Warwick Center to Route 2A in West Orange. As part of the Self-Help grant requirements, the Town installed a convenient trailhead parking area

on Hockanum Road at the base of the Hill. In recent years the view from the overlook has become obscured by trees. Removing some of the trees could restore the view.

In addition to its public recreation value, the Hockanum Hill parcel also benefits the Town by providing additional timberland. The standing timber has good value because the prior owner enrolled the forest in Chapter 61 and the timber stand was well-managed by a professional forester. A further advantage of the parcel for timber management is that it is located very near a 72-acre tract of Town Forest further west on Hockanum Road. This will make it convenient for the Town Forest Committee to plan forest management and timber harvests on both parcels at the same time.

The wildlife habitat value of the parcel is very high based on the Wildlife Inventory prepared by a professional wildlife biologist hired by the WOSC as preparation for applying for the Self-Help grant, and is identified as BioMap2 Core Habitat. The Hockanum Hill parcel also abuts the Warwick State Forest on two sides. It augments the permanent protection provided by the State-owned land from west to east, and it also functions as an important link in connecting large tracts of DCR land from north to south.

This project was done in cooperation with Mt. Grace Land Conservation Trust which pre-acquired the land and loaned money (which eventually became a grant of \$500)⁸ to do the Wildlife Habitat Study of the Hockanum Property. In order to get the Self Help Grant, the 2004 Warwick Annual Town Meeting voted to borrow \$125,000 to acquire the property with a condition that the Open Space Committee reimburse the town the principal and interest. The Open Space Committee undertook various fund raising activities:

- \$81,840 Self Help Grant from Division of Conservation Services (July 2004);
- \$7,500 William P. Wharton Trust Grant (May 2005);
- \$10,000 2004-2005 Recreation Trails Grant from MA DCR (August 2005);
- \$10,000 Field's Pond Foundation Grant (June 2006);
- \$4,000 North Quabbin Regional Landscape Partnership Small Grants Program (September 2006);
- \$10,600 Town of Warwick, May 2004 Annual Town Meeting Contribution;
- \$16,768 Private donations (local grassroots fund raising from selling note cards and maple syrup to soliciting cash contributions) started in May 2003; and
- \$500 Mt. Grace Land Conservation Trust Grant.

Black Gum Swamp Conservation Area

This 8.8 acre parcel was acquired by the Town in November 2007. Unlike the Hockanum Hill Conservation Area that includes many feet of frontage on a Town-maintained road (and an easily accessible roadside parking area with a short family-friendly hike to a scenic overlook), the Black Gum parcel consists of forested backland deep in the midst of Warwick State Forest at the west edge of Town. The parcel is located just north of a beautiful forest trail that runs through

⁸ Mt. Grace received a \$500 dollar grant from the Community Foundation of Western Massachusetts which allowed them to give a \$500 grant to Warwick.

the State Forest from Wendell Road west to Flagg Road. There is good trailhead parking at both ends of this through-trail.

The parcel includes a large vernal pool, interesting rock outcroppings, and a number of Black Gum trees (Tupelos) growing at the edge of a small forest swamp. Black Gum groves are listed by the State's Natural Heritage and Endangered Species Program as "threatened" plant communities. These groves are quite rare in Warwick. Since there are also several larger Black Gum swamp groves nearby on State Forest land, this section of Warwick has an unusual abundance of the species, probably because the area is so remote and difficult to access for timber harvesting that the trees have not been cut for many years. The parcel was acquired for the purpose of creating an interesting side loop trail off the main through-trail, and for protecting the Black Gum grove and the unusually deep vernal pool.

The Open Space Committee has a Town account which accepts contributions and from which the Open Space Committee can spend for the stated purpose without appropriation. The WOSC raised funds through private donations to pay for the land so that it could be given as a gift to the Town. The Warwick Women's Guild was the only group to give to the fund. All the rest of the money was received as donations from individuals. Town Meeting voted to accept the gift in October 2007.

Table 5-9: Town-Owned Open Space with Permanent Protection from Development

Property Manager	Site Name	Area	Map	Lot	Current Use	Condition	Recreation Potential	Public Access	Zoning	Level of Protection
Open Space Committee and Conservation Commission	Hockanum Hill Conservation Area	36.0	414	17	passive recreation, hiking, horseback riding, snowshoeing, cross country skiing, snowmobiling, hunting, trailhead parking, scenic view, wildlife habitat protection, linkage with State Forest greenway ridge corridor, link in Town-wide and regional trail system	Excellent	Restore the view from the overlook; create a loop trail; add a trailhead kiosk and map; possible ADA improvements to parking at trailhead	via Hockanum Road	Residential – Agricultural (RA)	Permanent
Open Space Committee and Conservation Commission	Black Gum Swamp Conservation Area	8.8	413	21	hiking, vernal pool and rare tree protection	Medium	Develop a loop trail to access the site; consider handicap accessible trail options; wildlife education	via trail connecting Wendell and Flagg Roads.	Residential – Agricultural (RA)	Permanent
Total		44.8								

Source: Warwick Assessor's Records and Maps, FY2019.

The Town of Warwick owns an additional 367 acres of open space that are not permanently protected (Table 5-10). All of these parcels are under the authority of the Select Board and are therefore considered to have limited protection from development. Roughly 327 acres of this land is considered part of the Warwick Town Forest and is under the care and management of the Town Forest Committee. If residents wanted to convert the Town Forest to sports fields, a Town Meeting vote could provide the authority. If the land was held by the Conservation Commission it would take a two-thirds vote of the Massachusetts State Legislature to convert open space to another non-conservation use. Many of these open spaces currently help protect wetlands and tributaries, provide public access to other large blocks of protected lands, and together help to extend the habitat and recreation value of the state lands. The Town actively manages the Town Forest and receives revenue from timber harvests on the land. In 2017, 88 acres were added to the Town Forest through the efforts of the Open Space Committee and a State grant that funded the purchase. The parcels, known as the Victoria Shaw lots, abut State forestland and the original Town Forest Reservation off of Wendell Road.

Table 5-10: Town-Owned Open Space with Limited Protection from Development

Property Manager	Site Name	Map	Lot	Area	Current Use	Condition	Recreation Potential	Public Access	Zoning	Level of Protection
Town of Warwick	Warwick Center Town Hall	405	16	0.42	Meetings, Recreational and Social Gatherings	Good	Maintain current conditions	Via Winchester & Athol Roads	Residential – Agricultural (RA)	Limited
Town of Warwick	Town Barn site	405	22	0.23	Vacant field	NA	None	Via Northfield Road	Residential – Agricultural (RA)	Limited
Highway Dept./Board of Health/Town Forest Committee	Allen Lot: Town Garage/ Town Dump Site/ Town Forest	405	33	53.00	Garage, Dump, and Forest Management; snowmobile trail	Good	Town Forest trail system	Via Winchester Road	Residential – Agricultural (RA)	Limited
Town of Warwick	Community School	405	38.2	25.57	Woods/Fields/ School/ Playgrounds	Good	ADA improvements; nature trails; environmental education	Via Winchester Road	Residential – Agricultural (RA)	Limited
Town of Warwick	Unitarian Church	408	86	8.40	Church, Old Fire Station	Good	None	Via Orange Road	Residential – Agricultural (RA)	Limited
Town of Warwick	Center School/ Town Common	408	90	3.90	New Fire Station, Police Station, Ball fields	Good	Maintain current conditions	Via Orange Road	Residential – Agricultural (RA)	Limited
Town of Warwick	Sarah Heyes Lot / Town Forest	409	26	7.90	Forest	Good	Town Forest trail system	Via Athol Road	Residential – Agricultural (RA)	Limited
Town of Warwick	Sarah Heyes Lot / Town Forest	409	29	14.40	Forest	Good	Town Forest trail system	Via Athol Road	Residential – Agricultural (RA)	Limited

Property Manager	Site Name	Map	Lot	Area	Current Use	Condition	Recreation Potential	Public Access	Zoning	Level of Protection
Town of Warwick	Gravel Pit	411	101	1.30	Abandoned Stump dump	Low	None	Via Wendell Road	Residential – Agricultural (RA)	Limited
Town of Warwick	Warwick Town Forest	414	20	16.50	Wildlife Observation/ Forest Management	Good	Town Forest trail system	Via Wendell Road on east side	Residential – Agricultural (RA)	Limited
Town of Warwick	Town Forest	414	43	70.5	Hiking, horseback riding, wildlife observation	Excellent	Town Forest trail system	Via Wendell Road on west side	Residential – Agricultural (RA)	Limited
Town of Warwick	Victoria Shaw lots / Town Forest*	414	45	88	Forest Management, Hiking, Horseback Riding	Good	Town Forest trail system	Via Town Forest	Residential – Agricultural (RA)	Limited
Town of Warwick	Wilbur Lot / Town Forest	415	1	75	Wildlife Observation/ Forest Management	Good	Town Forest trail system	Via Hockanum Road & Wendell Road	Residential – Agricultural (RA)	Limited
Total				365.12						

* Purchase was funded through the 2014 Environmental Bond Bill.

Source: Warwick Assessors' Records and Maps, FY2019, and Town of Warwick, MA Forestlands booklet, November 2017.

D.3 Recreational Resources and Open Space Equity

Open Space Equity means taking a look at conservation and recreation opportunities available in the town and seeing if there is an area of the town that seems to be lacking resources. This is somewhat difficult to do in a town the size of Warwick. There is a heavier concentration of people around the major lakes and in the center of town, but most other residences are spread out along the rural roads in town. Most of the recreational resources are on State forest land, such as Ohlson Field recreation and picnic area, the swimming beach at Laurel Lake, the unsupervised swimming at Sheomet Pond, the former picnic area in the Gulf, and the hiking and snowmobile trails. There is a basketball net at the old school and a baseball diamond at Fellows Field. The basketball net, baseball diamond, and Ohlson Field are in the center of town.

In 2010, in response to results from the Open Space and Recreation Survey, the Town acquired the Town Beach parcel on Moores Pond, located at the intersection of Wendell Road and South Holden Road, for use by residents for swimming. Funding for weekly bacteria monitoring during the summer is raised by the volunteer Moores Pond Beach Committee, and volunteers help with beach cleanup. The pond is popular for swimming, fishing and paddling. In addition to the beach, there is a State installed unimproved public boat launch on Wendell Road. Motorboats of 10 or more horsepower are prohibited.

Given our community setting and traditions, there is no area of town that is deprived of recreational opportunities relative to other areas. Most respondents to the 2019 Warwick Open Space and Recreation Survey felt that recreational programs and recreational facilities in town have either changed for the better or remained about the same. There are a host of activities that people do both within town and out of town. The most popular activities according to the Open Space Survey are walking, hiking, bird watching, gardening, swimming, boating (non-power), snowshoeing, picnicking, and road bicycling. All of these activities can be done throughout Warwick.

E. OPPORTUNITIES FOR FUNDING OPEN SPACE AND CONSERVATION PROJECTS IN WARWICK

The opportunities for the Town of Warwick to procure funding for open space projects can be a challenge. While the town has many unique conservation values, such as nearly half the town owned by the MA DCR as State Forest and additional acres conserved by private owners through conservation restrictions and non-profit ownership, only the private land subject to conservation restrictions is truly protected.

Warwick is a small village (with a population of approximately 750 persons) with very limited financial resources available for funding open space projects. The Town is zoned entirely agricultural/residential and has no industrial and virtually no commercial tax base. In addition, since 50% of Warwick is owned by the State, the tax revenue derived from half the Town is limited to the State's PILOT (Payment In Lieu of Taxes) program, whose modest contribution varies from year to year. This puts Warwick in the position of being unable to set the tax rate on 50% of its acreage. Also, since the State-owned land cannot be developed, 50% of the Town will never supply the higher tax revenue generated by high-end taxable residences. (It is important to acknowledge, however, that the absence of residences in over 50% of the Town spares Warwick the significant increase in the cost of Town Services that accompanies a major increase in residential development.)

Because Warwick has so few residents, there is an unusually small pool of donors from whom to request contributions for open space projects. (But residents truly care about the Town and are prepared to be generous for the sake of a good project, as was shown with Hockanum Hill.) The following paragraphs provide a brief description of some of available resources for funding open space and conservation projects. In addition, two reports from the Highstead Foundation and Harvard Forest provide additional information on recent trends in private and public funding of land conservation in New England:

Foundation Funding for Land Conservation in the Northeast: Trends in Grant Making between 2004 and 2014 -

<https://www.wildlandsandwoodlands.org/sites/default/files/Foundation%20Report%202019%20-%20FINAL.pdf>

E.1 LAND Grant Program (formerly the Self-Help grant program)

The Commonwealth of Massachusetts offers a grant program through the Executive Office of Energy and Environmental Affairs, Division of Conservation Services, to assist municipalities with open space projects. This program was formerly known as the Self Help grant program and is now entitled the LAND grant program (Local Acquisitions for Natural Diversity). Conservation or Agricultural Commissions from communities with an up-to-date Open Space and Recreation Plan are eligible to apply for reimbursement grants to acquire land for conservation and passive recreation in fee or for a conservation restriction. The grant supports the purchase of forests, fields, wetlands, wildlife habitat, unique natural, cultural, or historic resources, and some farmland. The public must have reasonable access to the land. Reimbursement rates are between 52-70%, with a maximum grant award of \$400,000.

E.2 PARC Grant Program

The Parkland Acquisitions and Renovations for Communities (PARC) Grant Program, offered by the Executive Office of Energy and Environmental Affairs, Division of Conservation Services, was established to assist cities and towns in acquiring and developing land for park and outdoor recreation purposes. These grants can be used by municipalities to acquire parkland, build a new park, or to renovate an existing park. Applications are open to all municipalities that have submitted an up-to-date Open Space and Recreation Plan, however, the number of residents in a town may affect the grant amount. Reimbursement rates are between 52-70%, with a maximum grant award of \$400,000.

E.3 Massachusetts Land and Water Conservation Fund Grant Program

The Massachusetts Land and Water Conservation Fund Grant Program is offered through the Executive Office of Energy and Environmental Affairs, Division of Conservation Services, and is funded from the Federal Land and Water Conservation Fund. The program provides up to 50% reimbursement for the acquisition of parkland or conservation land, creation of new parks, renovations to existing parks, and development of trails. Municipalities with up-to-date Open Space and Recreation Plans are eligible to apply.

E.4 Department of Conservation and Recreation Funding

DCR has a limited budget for funding land protection state-wide through fee purchases or buying Conservation Restrictions. To make their expenditures as effective as possible, DCR is focusing

on expanding existing large blocks of state-owned land. DCR has designated areas throughout the state that have priority for funding. Because Warwick contains so many large tracts of State Forest and because there is such strong potential for linkage between them, Warwick forestland has high conservation value according to DCR's criterion of expanding existing large blocks of forest. As of the writing of this plan, DCR is considering purchasing a 108-acre parcel in the northeast section of town that would add to an existing large block of protected State Forest.

E.5 Mount Grace Land Conservation Trust

Mount Grace Land Conservation Trust works with private landowners to protect their land in many creative ways: with working forest and forever wild conservation restrictions, by taking ownership and managing land as multi-use resources or natural area reserves, and by providing services and locating funding sources to enable transfers of land to public ownership. MGLCT's Landscape Conservation Program uses funding sources like the United States Forest Service Forest Legacy Program and the United States Fish and Wildlife Service North American Wetlands Conservation Act, and the Massachusetts Energy and Environmental Affairs Landscape Partnership Grants because they are structured to complement a multi-landowner approach to conservation. Mount Grace also uses a variety of tools to support farm conservation, especially the Agricultural Preservation Restriction (APR) program.

The Community Conservation Program at MGLCT helps towns identify their top land protection priorities and reach out to diverse groups of stakeholders in order to protect scenic resources and community character. The program outlines possible conservation strategies so town boards can make informed decisions.⁹ Although Mount Grace Land Conservation Trust (MGLCT) stands ready to help the Town of Warwick, it does not have funds of its own available to donate to the Town for protecting open space. MGLCT, like other land trusts, must be creative in searching for funding for projects. MGLCT can be most helpful by serving Warwick on a consultant basis and by recommending funding sources for which the Town can apply on its own (as it did with the Hockanum Hill Project). Also, when it is necessary, MGLCT can further assist the Town by pre-acquiring an open space parcel and holding it on behalf of the Town to allow time for Warwick to take out a loan and apply for grants to pay for it.

E.6 Regional and Statewide Conservation Organizations

In addition to MGLCT, several other regional and statewide conservation organizations have completed conservation projects in Warwick and continue to be available for partnership conservation projects. The New England Forestry Foundation (NEFF) owns land in Warwick. NEFF's focus is conserving managed forest lands. Massachusetts Audubon Society (MassAudubon) holds conservation restrictions in Warwick, and their focus is protecting the biodiversity of Massachusetts. Additional organizations include the Trustees of Reservations and The Nature Conservancy. Each of the conservation organizations identified above have access to

⁹ Mount Grace Land Conservation Trust website: <https://www.mountgrace.org/programs>. Accessed May 7, 2019.

no interest or low interest loan funds to assist in the conservation of significant natural resources through the Norcross Wildlife Foundation's loan program and the Open Space Institute's funding programs.

E.7 North Quabbin Regional Landscape Partnership (NQRLP)

This local regional landscape partnership was formed to facilitate open space conservation in the North Quabbin Region. For two years, the NQRLP received sufficient funding to offer a "small grants" program (with a maximum award of \$4,000). Unfortunately, this grant program has now been discontinued due to lack of funding. While it was available, it did assist Warwick's Hockanum Hill Project with a \$4,000 reimbursement grant. Many towns in our region are hoping that the grant program will be re-instated because it was particularly helpful in providing seed money (for appraisals and other start-up costs) to get new open space projects underway.

E.8 Conservation Partnership Grant Program

This is a State grant program that is designed to help land trusts and other non-profit conservation organizations acquire interests in land for conservation or recreation purposes. Potential projects fall into one of two categories: acquisition of the fee interest in land or a conservation restriction; or due diligence for land or a conservation restriction that was donated to the organization. The maximum reimbursement amount available for a single project is 50% of the total eligible project cost up to the grant award maximum of \$85,000. This is a resource that could be helpful to Warwick because there are so many parcels in Town with very high conservation value that organizations such as MGLCT and Mass Audubon would be interested in working with the Town to conserve. The challenge is finding funds for the remaining 50% of the project.

E.9 Landscape Partnership Grant Program

This State grant program provides funding for large-scale (minimum of 500 acres), joint conservation projects completed in partnership with federal, state, and local governments, and non-profits. The grant is a reimbursement for up to 50% of the project cost with a maximum grant award of \$1,250,000. Eligible projects include: purchase of land in fee simple for conservation, forestry, agriculture, or water supply purposes; purchase of a Conservation Restriction, Agricultural Preservation Restriction, or Watershed Preservation Restriction; and construction of a park or playground in communities with less than 6,000 residents. Applications must be submitted jointly by two or more applicants including municipalities, non-profits, and State agencies.

E.10 Forest Legacy Program

This is a federal grant program administered for the purpose of conserving forestland nationwide. MGLCT has been very successful in applying for Forest Legacy funds for projects in the North Quabbin Region. In the spring of 2009, MGLCT was awarded a Forest Legacy grant in the amount of \$1.4 million for protecting 919 acres of forest along the Metacomet-Monadnock-Mattabesett Trail (now designated the New England National Scenic Trail) and in the trail viewshed. A small parcel of land in Warwick was included in the grant proposal.

As a national program, Forest Legacy funding is very competitive. There is the problem that it can take up to three or four years for landowners to receive payment for selling the fee or CR once they agree to participate in one of the grant applications. This may be a longer time than some landowners can afford to wait to receive compensation.

E.11 Agricultural Lands Conservation Program / Wetlands Reserve Easements

This is a federal funding program through the United States Department of Agriculture's (USDA) Natural Resource Conservation Service (NRCS). The program provides financial and technical assistance to help conserve agricultural lands and wetlands. Under the Agricultural Land Easements component of the program, NRCS helps state and local governments and conservation organizations protect working agricultural lands and limit non-agricultural uses of the land. NRCS provides up to 50% of the fair market value of the agricultural land restriction. Under the Wetlands Reserve Easements component of the program, NRCS helps to restore, protect and enhance wetlands. Depending on the length of the restriction, NRCS may pay up to 100% of the cost of the restriction as well as wetland restoration costs.

E.12 Quabbin to Cardigan (Q2C) Landscape Corridor Funding

In 2009, the Quabbin-to-Cardigan Partnership launched its Land Conservation Grants program, which underwrites transaction costs—appraisals, surveys, title research, staff time, etc.—on key land conservation transactions that protect land identified in the Q2C conservation plan. Over the past nine years, the grants program has awarded more than \$930,000 to 89 separate land conservation projects that have conserved more than 30,000 acres of land in the region. The Partnership is designed to protect forests in the 100-mile, largely unfragmented corridor that runs from the Quabbin Reservoir north to the southern edge of the White Mountains. Warwick's geographic location (at the MA/NH border), its large blocks of intact forest, and its pristine wildlife habitat make it a strong candidate for Q2C funding, as it includes some of the high priority areas identified in the Q2C conservation plan.

In 2013, the Q2C Partnership began offering small grants to support the development, improvement, and maintenance of hiking trails in the Q2C region. Over 43 trail projects have been funded and some \$247,000 has been awarded to partners to improve nearly 70 miles of trails within the region, conduct trail planning, develop parking areas, signs, trail maps, and trail guides, and purchase important trail lands. The trail grants are awarded through a competitive

process and are available for projects in both the New Hampshire and Massachusetts portions of the Q2C.¹⁰

E.13 Community Preservation Act

The Community Preservation Act is legislation that allows cities and towns to raise funds for use in local open space, historic preservation, community housing, and outdoor recreation projects. The Community Preservation Act (CPA) provides new funding sources which can be used to address three core community concerns:

- Acquisition and preservation of open space
- Creation and support of affordable housing
- Acquisition and preservation of historic buildings and landscapes

The CPA allows communities to create a local Community Preservation Fund to raise money through a surcharge of up to 3% of the real estate tax levy on real property for open space protection, historic preservation and the provision of affordable housing. The act also creates a state matching fund, which serves as an incentive to communities to pass the CPA. .

Municipalities must adopt the Act by ballot referendum. Communities can choose to exempt the first \$100,000 of taxable residential real estate value, as well as low income households, from the surcharge.

A minimum of 10% of the annual revenues of the fund must be used for each of the three core community concerns, and up to 5% may be used for administrative expenses of the Community Preservation Committee. The remaining funds can be allocated for any combination of the allowed uses, or for land for recreational use. This gives each community the opportunity to determine its priorities, plan for its future, and have the funds to make those plans happen. If residents don't feel the CPA is working as they expected, they can repeal it or change the surcharge amount.

F. CRITERIA FOR OPEN SPACE PROTECTION

Warwick contains much land with high open space and recreation value based on objective, statewide standards. This generally high conservation value derives from the following factors:

- Over 50% of the town's land has already been permanently protected so most of the land's original conservation values remain intact;
- Warwick has distinctive topography that generates excellent wildlife habitat, scenic views, and good recreational potential;

¹⁰ Quabbin to Cardigan Partnership website: <https://q2cpartnership.org/grants/>. Accessed May 7, 2019.

- Warwick’s relatively remote, rural location has resulted in much of the privately-owned land remaining unfragmented and un-subdivided (partly due to the tax incentive provided by the Chapter 61 programs); and
- With over 50% of the land permanently protected, an unusually high percentage of other parcels abut currently protected open space, which confers an extra degree of conservation value upon them.

Warwick is fortunate to have such a strong foundation of previously conserved open space. In fact, some of what would be clearly the highest priority areas to target for permanent protection have already been conserved through State Forest ownership, namely Mt. Grace itself, Stevens Swamp, Sheomet Pond, Richards Reservoir, and the south shore of Laurel Lake.

There are other high priority open space and recreation areas in Town that are partially protected currently by State agencies, land trusts (or Town ownership) that include the Barber Hill/Hockanum Hill ridge corridor, the Black Brook/Hodge Brook/Gale Brook stream corridor, and Bass Swamp. Often backland areas such as these have high scenic, wildlife habitat and recreational value, and because they lack road frontage they are not suitable for development and therefore make ideal candidates for open space and recreation conservation.

There is a third category of high value open space areas in Warwick that currently have no protection. This category is comprised mostly of unprotected farm land, and includes the agricultural land in North Warwick, the remaining unprotected hay fields on Chase Hill Road, the fields on Shepardson Road, the fields near the historic village center, and other smaller fields associated with historic farmsteads scattered throughout Town. The undeveloped shoreline of Moore’s Pond is also in this category of high-value open space that currently lacks protection.

F. 1 Basis for Generating Criteria

Since over half of Warwick’s land is already permanently protected, current residents have the opportunity to plan for future development in the context of a town that already contains an exceptional amount of conserved open space and passive recreational opportunities. In order to develop “Criteria” in this rare municipal scenario, the focus will be on:

What parcels possess such exceptional open space and recreational values that they are worth conserving even in the face of the Town already being 50% permanently protected open space?

To generate an answer, the following should be reviewed:

1. *Statewide Value:* Are there unprotected open spaces in Warwick that are so exceptional statewide that the Town is very fortunate to possess them within its boundaries; and therefore Warwick has the incentive to preserve these open space “treasures” for the benefit of its own residents as well as for the citizens of the Commonwealth? Newly

discovered rare wildlife habitat, BioMap2 Core Habitat areas, and critical linkages between large conservation areas are examples.

2. *Town-wide Value:* Are there unprotected parcels that are particularly critical for preserving Warwick's culture, historic landscapes, scenic views, rural economy, ecology or recreational resources? Such parcels would be beloved and meaningful to a large number of Warwick residents.
3. *Neighborhood Value:* Are there parcels that are exceptionally significant to and highly used by residents of a particular section of Town (as well as by residents from other parts of Warwick) that if lost to unplanned development would clearly diminish the quality of life in that neighborhood and in the Town as a whole?
4. *Future Development Value:* Are there parcels in Town that are particularly well suited for future residential or small scale commercial development that Warwick would consider purchasing so that it can plan its own development (such as senior housing); and if so, are there also accompanying open space, recreational and green corridor amenities that the Town would like to secure to fulfill that vision of a well-planned development?

F.2 Simultaneous Highest Priorities and Open Space Protection Opportunities

Currently and in the foreseeable future, Warwick includes parcels of land that are very high priority for open space protection in several different categories simultaneously. In this scenario, it is the availability of opportunities that will control which projects are undertaken. Open space protection can move forward only when a landowner is interested in conserving their land or when funding is available to pay full market value when critical parcels come on the open market.

F.3 Preferred Type of Open Space Protection for Warwick – To Retain Private Ownership

Given how much land in Warwick is State-owned, and given concerns about keeping land on the tax rolls, the ideal form of open space protection for the future is the purchase of Conservation Restrictions, Agricultural Preservation Restrictions, and trail easements. In this way, the land itself remains in private ownership and stays on the tax rolls. An open space and recreation budget stretches further when it is possible to purchase just a CR, APR or trail easement, rather than having to pay for the entire parcel.

F.4 Open Space Criteria

As explained above, the six open space criteria categories listed below are not necessarily listed in priority order because Warwick has high priorities in different open space categories *simultaneously*. However, within each category, examples of situations that might occur in

Town for each of the categories are prioritized, with the highest priority scenario listed first. For example, under the Open Fields category, land with “prime” agricultural soils currently in active use would be a higher priority than fields in Town that are being used for crops, hay or pasture, or just being faithfully mowed and maintained. The highest priorities represent projects of such high value that the Town may want to raise funds in order to accomplish them; whereas with lower priority projects, the Town might not be willing to expend funds but would consider accepting the gift of a Conservation Restriction or trail easement if it were donated by the landowner.

F.4.1. Open Fields

- a. With “prime” agricultural soils currently in active use.
- b. Any fields with soils designated “prime” agricultural or “state important”.
- c. Fields that are adjacent to farmland preserved with an Agricultural Preservation Restriction (APR) that are currently being used by the APR farmer or could potentially be used by that farmer.
- d. Fields that have particular scenic, historic or cultural value (including fields visible from the historic village center).
- e. Any fields in Town that are being used for crops, hay or pasture, or just being faithfully mowed and maintained.

F.4.2. Unfragmented Forest Blocks

- a. “In-holdings” in large blocks of forest - unprotected, privately owned parcels that lie within large blocks of protected forested land.
- b. Forestland adjacent to or near to Warwick Town Forest—to add to the timberland to be managed by the Warwick Town Forest Committee to generate income from timber sales for the Town.
- c. Forest parcels that connect existing permanently protected forested parcels for the sake of the integrity of wildlife and trail corridors.

F.4.3. Wildlife Habitat

- a. Stream corridors--these are high in wildlife value, and many in Warwick are particularly pristine because they are distant from development. In particular, stream corridors identified as Cold Water Fisheries should be prioritized for protection.
- b. Ridge-line corridors – Warwick has several undeveloped ridge lines; ridge tops are known to be used by large mammals with extensive territories.

- c. Vernal pools – Warwick has many vernal pools, on land held in both State and private ownership.
- d. Endangered species – parcels that are known to host rare and endangered species.
- e. Bio-diversity – parcels that contain BioMap2 Core Habitat or Critical Natural Landscapes.

F.4.4. Recreation Resources

- a. Trail corridors – acquire parcels that secure existing trail corridors, or provide for new ones by filling missing links. [With recreational trail corridors, it will be necessary to work out potential issues of disagreement between different trail user groups.]
- b. Scenic views – preserve outstanding views within recreational areas by fee purchase or conservation easements.
- c. Trailhead parking – evaluate the potential for safe and suitable trailhead parking, which is an important recreational amenity for both Warwick residents and for visitors from out of town.

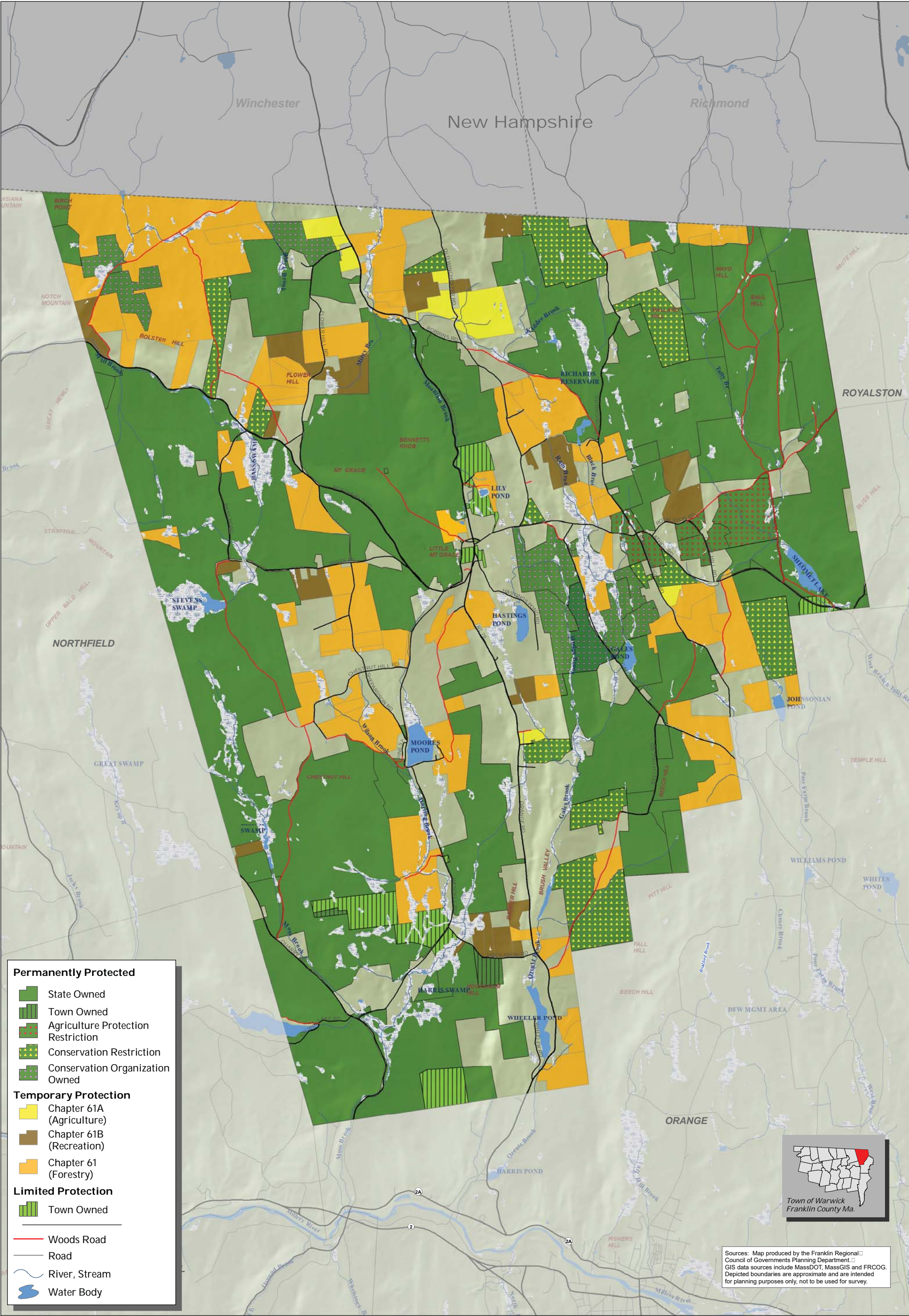
F.4.5. Scenic Resources

- a. Views across fields – roadside views across fields are an important scenic amenity in a town as heavily forested as Warwick; their scenic value reinforces the importance of protecting agricultural fields adjacent to Town roadsides.
- b. Hilltop views (views from hilltops) – many of Warwick’s hilltops are heavily forested, therefore the scenic views made possible by the Town’s few open hilltops provide an important scenic resource, particularly on Flower Hill and Shepardson Road.
- c. Ridgeline views (views of ridgelines) – Warwick has several undeveloped ridgelines that are an important part of the Town’s rural scenery. Maintaining undeveloped ridgelines benefits both the scenic value of the Town and the quality of the wildlife habitat (see 3 b. above).
- d. Views across ponds – large ponds, like large open fields, provide the potential for exceptional views. When a major, heavily-traveled town road passes by a large pond such as Moore’s Pond, many residents have the opportunity to enjoy the view. Preserving the view of undeveloped shoreline on the opposite shore of the pond accomplishes several open space goals: 1) preserving a scenic resource for future

generations, 2) preserving valuable wildlife habitat, 3) protecting water quality for swimming, and 4) protecting water quality for any shallow wells in the vicinity.

F.4.6. Historic and Cultural Resources

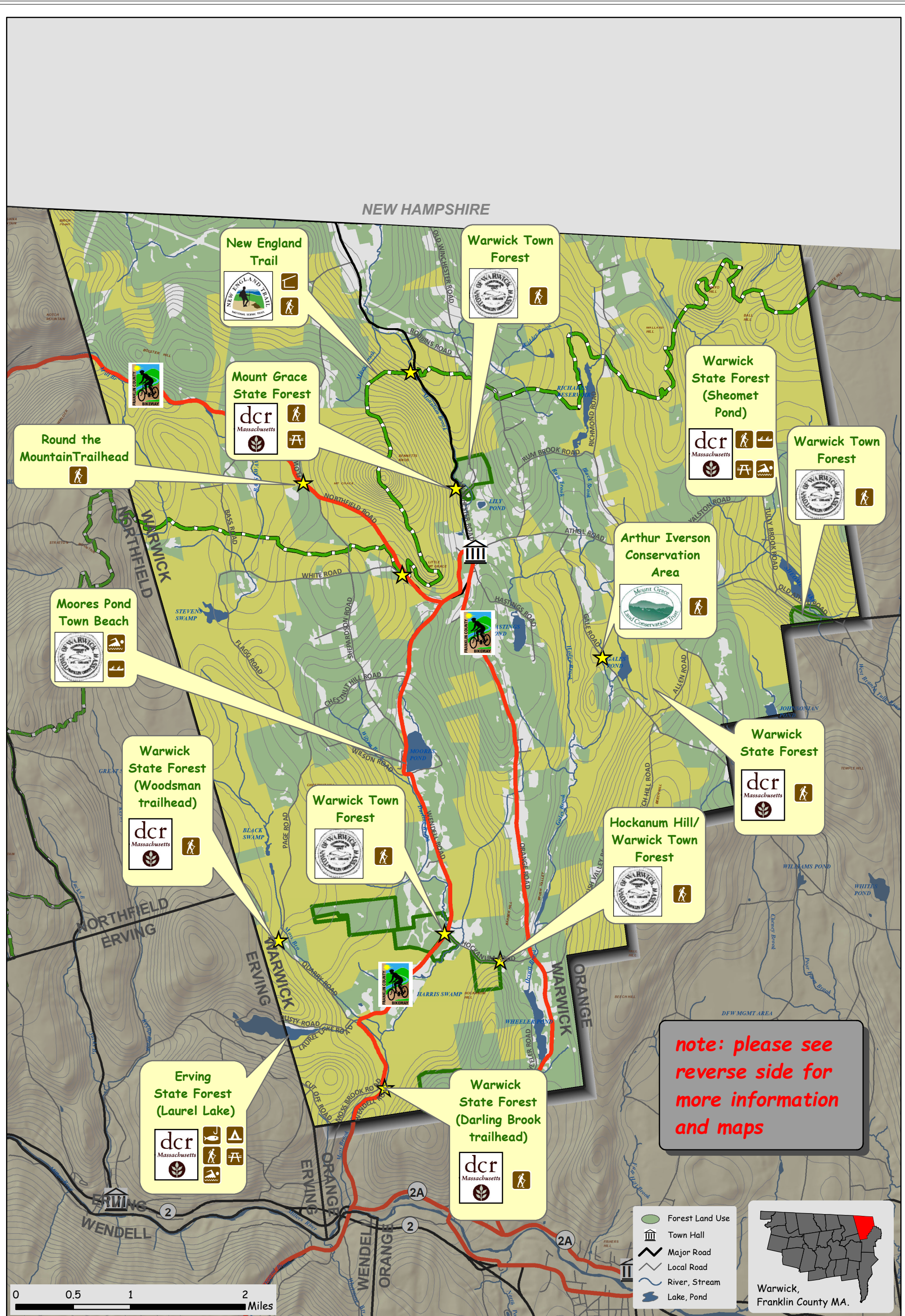
- a. Historic Village Center District – Warwick has an exceptionally homogeneous historic center. Helping it to remain undiluted by incongruously modern construction will preserve the Town’s historic heritage.
- b. Historic farmsteads – Warwick still contains many historic farmsteads where the original farmhouse, barns and outbuildings, stonewalls, and fields are still intact. Each of these is an historic artifact worthy of preserving through the use of conservation restrictions.
- c. Historic foundation artifacts – Warwick has a remarkable number of historic foundations (see map of Warwick cellar holes in Section 4). Of particular note are the cluster of building foundations and other types of structures associated with historic mill sites. Parcels that contain exceptional historic artifacts should be considered for conservation.



Town of Warwick Open Space & Recreation Plan 2020

January, 2020

Open Space



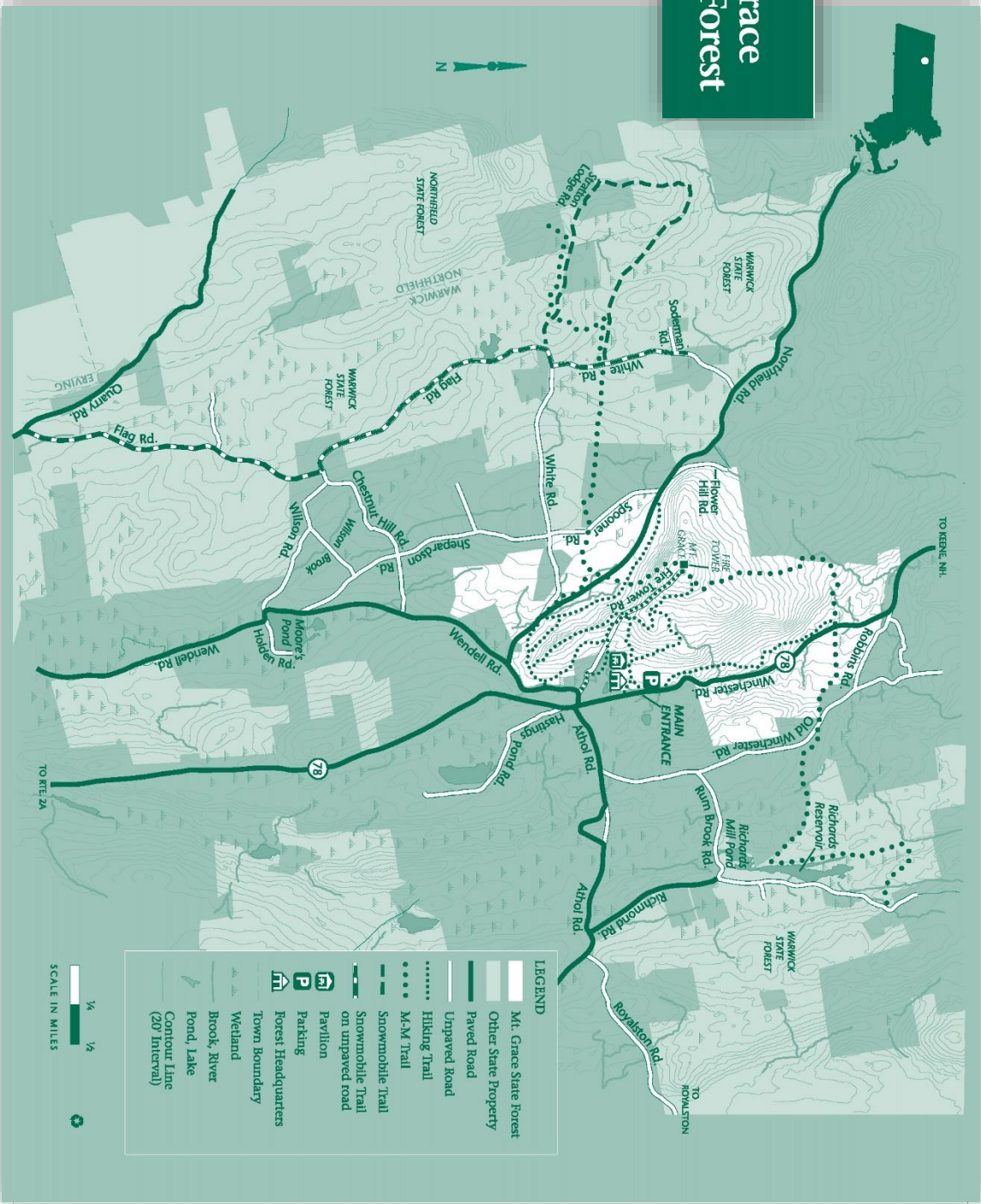
Access to Off-Road Recreation Warwick, MA

- Recreation Type**
- Hiking
 - Fishing
 - Canoeing
 - Swimming
 - Camping
 - Picnicing
 - Trailhead
- Land Use**
- Franklin County Bikeway
 - New England Scenic Trail
 - Permanently Protected Open Space
 - Warwick Town Forest

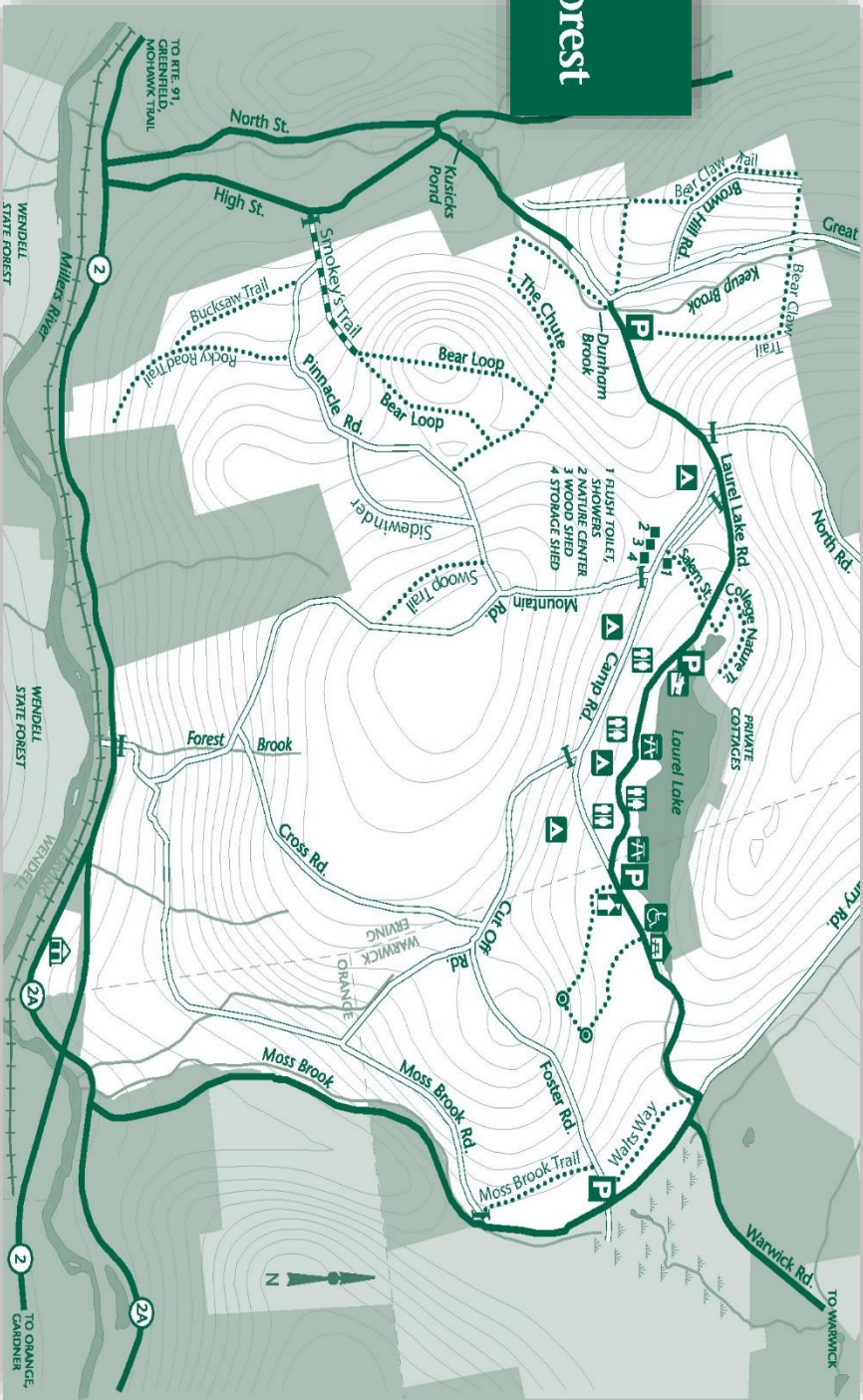
Sources: Map produced by the Franklin Regional Council of Governments Planning Department. GIS data sources include MassDOT, MassGIS, FRCOG, Franklin Land Trust, Trustees of Reservations. Depicted boundaries are approximate and are intended for planning purposes only, not to be used for survey.

frcog Franklin Regional Council of Governments

dc^r Massachusetts
Mt. Grace
State Forest



dc^r Massachusetts
Erving
State Forest



Discover Mount Grace

Arthur Iversen
Conservation Area

Gale Road
Warwick, MA



1461 Old Keane Road
Athol, MA 01331
(978) 248-2043
mountgrace.org

Trail Difficulty: **Moderate**

Approximate Trail Length: **1.5 miles west of Gale Road, 0.2 miles east of Gale Road**

Approximate Elevation Gain: **150 Feet**

Trail Marking: **◆**

Directions: From the junction of routes 2A and 78, west of Orange center, follow Route 78 north to Warwick center. Turn right onto Athol road, travel 0.8 miles and then turn right onto Gale Road, a dirt road. Take Gale Road for 1 mile to the Devils Washbowl Trail kiosk on the right, and another 0.1 miles to the Rum Brook Trail kiosk on the left.

About the Property: In the shadow of nearby Mt. Grace lies the 500 acres of forest within the Hodge and Rum Brook watersheds of the Arthur Iversen Conservation Area. The 1.5 mile Devil's Washbowl trail begins on the west side of Gale Road. From the kiosk, take the trail through the hemlock-hardwood forest to a small beaver pond on Hodge Brook. Continue along the rim of the brook basin to a marked sign to view the Washbowl, where a seasonal waterfall may be seen. The trail continues through the woods back to Gale Road. Take a right onto Gale Road to return to the trail head.

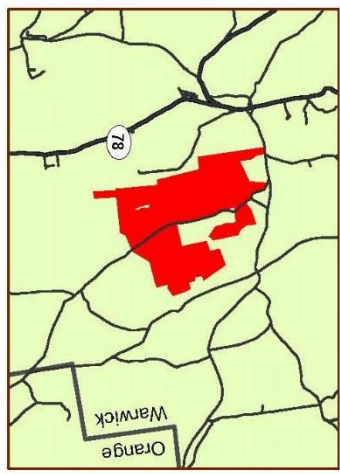


A second trail begins on the east side of Gale Road, an easy northeast walk leads to a foot bridge and an open view of the Rum Brook wetland. Continue across and up a short rise for views of a recent timber harvest designed to create shrub habitat for rare birds.

Learn more at mountgrace.org

Arthur Iversen
Conservation Area

Gale Road
Warwick, MA



1461 Old Keane Road
Athol, MA 01331
(978) 248-2043
www.mountgrace.org

SECTION 6

COMMUNITY GOALS

A. DESCRIPTION OF PROCESS

The Town of Warwick's open space and recreation goals from the 2010 Open Space and Recreation Plan were reviewed by the members of the Open Space Committee and were reaffirmed through a thoughtful and comprehensive public outreach and planning process that included the following:

- The Warwick Open Space Committee (WOSC) Chairs invited WOSC members to participate in the update of the Warwick Open Space and Recreation Plan in May of 2018. Members of local boards, Warwick citizens and Selectmen were also encouraged to participate.
- In May of 2019, an Open Space and Recreation Survey developed by the Warwick Open Space Committee was mailed to the 460 recipients of the Warwick Newsletter and was posted to the Warwick chat room called the Warwick L, which means it went to both residents and non-residents. Additional copies of the survey were also made available at the Library and Town Hall. Copies of the survey were distributed during the Annual Town Meeting on May 6, 2019. Fifty-three responses were received for a household response rate of 15 percent. (See Appendix B).
- Between June 2018 to December 2019, the Open Space Committee and the Franklin Regional Council of Governments Planning Department developed this Open Space and Recreation Plan using several methods for involving public participation, including:
 - A summary of the Open Space and Recreation Survey results was compiled and used as the basis for the development of Section 8 – Goals and Objectives as well as the overall open space and recreation vision.
 - The Open Space Committee held 10 public meetings to discuss the various sections of the plan and maps.
 - Copies of the Open Space and Recreation Plan maps and the Seven Year Action Plan were placed at the Warwick Library. All comments that were received were reviewed by the Open Space Plan Committee and, if appropriate, were incorporated into the Plan.
 - Prior to the Public Forum the Public Forum Flyer and a Summary of the Warwick Open Space and Recreation Survey results was included in the Warwick Newsletter (see Appendices B and C).

- A public meeting notice describing the public forum was sent to the Athol Daily News and the Greenfield Recorder.
- Approximately 25 residents attended a public forum held at the Town Hall on January 28, 2020, where people reviewed and discussed the inventory, analysis, community goals, objectives, draft maps and the Seven Year Action Plan priorities. All public comments were recorded and have been incorporated into the plan, where appropriate.

B. STATEMENT OF OPEN SPACE AND RECREATIONAL GOALS

People live in Warwick because they like the peace and quiet and the air and water quality. According to the 2019 Open Space and Recreation Survey, respondents also highly value the rural, small town character and the open fields, forests and trails. There was a consensus among most survey respondents that it was very important or important to conserve clean air, clean drinking water, lakes/streams/ponds, and the town's rural character. An overwhelming majority of respondents believe historic and archeological sites should be identified and protected, and 63% of respondents felt the sites should be made more accessible.

Warwick residents have a deep appreciation of the town's historic buildings, forests, agricultural lands, and breathtaking scenery. Warwick's landscape - its working farms, extensive forests, Town Center and the Common - gives the town its unique character and charm.

Residents who responded to the Open Space and Recreation Survey and participated in the process of developing this Open Space and Recreation Plan have a shared vision for the future of Warwick's natural, historical, and recreational resources.

Our vision for the Town of Warwick is to preserve our valued agricultural landscapes and working farms, to protect the beauty and unique rural character of our community, to protect our water resources and drinking water supplies, to preserve contiguous tracts of forested land, and to support sustainable economic development that protects our natural, historic, and cultural resources, strengthens the tax base, provides services, and provides a diverse mix of housing opportunities for residents. We envision a proactive planning process that encourages land uses that sustain the health of our waters, forests, wildlife and working farms, preserves historic resources, and helps the Town to permanently protect its most valued open spaces.

We envision a process in which the Town actively assists landowners and developers in designing projects that sustain and enhance our community's shared assets and character. This Open Space and Recreation Plan is a vital component of a proactive, sustainable land planning and development process which will strive to effectively and equitably manage current and future development pressures facing Warwick while preserving natural resources and

wildlife habitat, historic features, scenic roads and vistas, and recreational opportunities for current and future residents of our town.

As described in the Vision Statement, Warwick's large blocks of forested land and farmland will be conserved as a result of cooperative efforts between private landowners, and local and state agencies and private non-profit organizations. These lands will remain under private ownership and control, continuing to provide income to the town via property taxes. The town's rivers and streams will be clean enough for fishing and swimming. Residents will continue to enjoy clean drinking water from aquifers that have been protected from contamination.

In an ideal Warwick, there will be a diverse local economy, anchored by businesses and agricultural operations. Residents will speak proudly of their successful efforts to maintain and restore historic buildings throughout Town. The Town will continue to be supportive of local farmers and the value they offer to the town. By supporting local agricultural and forestry businesses, town residents (and others) will have access to fresh vegetables, dairy products, fruit and meat produced close to home, as well as the opportunity to buy forest products raised by neighbors. Promoting these agricultural enterprises will help farms stay viable and maintain open space.

The Town and other public agencies will acquire land and/or trail easements so that residents of all ages and abilities will enjoy a system of well-maintained trails in Warwick that offer opportunities for bird watching, wildlife viewing, hiking, horseback riding, cross-country skiing, and snowmobiling. In addition, the town will have been successful at attracting state and federal grants towards the development of recreational and outdoor educational programs for youth and adults that support residents' respect and appreciation for their heritage and the natural world, and honor the Native American history of Warwick.

Natural resource conservation efforts in Warwick will tie into larger regional efforts that provide for large tracts of contiguous open space and wildlife corridors integral to promoting biodiversity and the resilience of plants and animals in a changing climate. Open space conservation and management strategies will evolve with climate change research and science to promote resilient landscapes and to meet the needs of present and future generations.

Even though the majority of residents live far apart they gather through the seasons at popular recreation and community gathering sites around town such as Ohlson Field, Moores Pond, the Community School, Town Hall, Transfer Station, and Laurel Lake Beach. These places provide opportunities for residents to mingle, and share news and events and resources. Warwick encourages local entrepreneurship simply by providing a rural setting, access to advanced telecommunications infrastructure, and a strong sense of community that attracts and nurtures home businesses through the natural interactions between people who want to spend time in the Town and in the environment of their choice.

SECTION 7

ANALYSIS OF NEEDS

The Warwick Open Space and Recreation Plan incorporates the inventory of the natural, scenic, and land based recreational resources that are available in Town (Section 4), identifies the most important parcels of land that contain these resources (Section 5), and based on the community's general goals (Section 6), makes comparisons between the current status of the resource inventory compared to the desires of the community (Section 7). In this subsection, a Summary of Natural Resource Protection Needs, the environmental values that have already been addressed in Sections 3, 4 and 5 are summarized. In the Summary of Community's Needs subsection, residents' recreation and open space needs are identified, using the 2019 Open Space and Recreation Survey, comparisons with the 2010 Survey, and specific elements of Section 3, Community Setting. Finally, in the Management Needs subsection, the obstacles to the effective resolution of these needs are addressed including organizational barriers and the most significant land use conflicts concerning open space and natural resource use.

A. SUMMARY OF NATURAL RESOURCE PROTECTION NEEDS

According to the 2019 Open Space and Recreation Survey, the most important reasons for Warwick residents' decision to live here are peace and quiet, air and water quality, the rural or small town character, and open fields, forests, and trails. The most important natural or scenic resources to protect are clean air, clean drinking water, lakes/streams/ponds, and rural character. These results are similar to those of the 2010 survey.

Survey respondents overall expressed support for actions designed to protect or conserve open spaces and natural resources in Warwick. The majority of respondents either strongly support or support encouraging sustainably managed forests and farms in town. In addition, encouraging conservation by non-profit organizations, accepting donated conservation land, encouraging the use of Chapter 61, 61A, and 61B, and encouraging conservation by State agencies, were supported by the majority of survey respondents.

Warwick is in a unique situation among other communities in the region due to the fact that over 50% of its land is already permanently protected from development and there is also a relatively high degree of connectivity among protected areas. Connectivity relates to the manner in which open space parcels abut each other and are thus connected over a large area. This high degree of connectivity makes it easier for wildlife to move across the landscape without contacting people. It also provides residents of Warwick opportunities for developing a network of trails for recreational purposes. Gaps that exist between the protected state forestlands are often parcels of land enrolled in the Ch. 61 program, which are considered to be temporarily protected from development. Temporary and permanently protected land is over 75% of Warwick's land area.

Warwick Officials may want to focus on continuing the good working relationships with regional land trusts for the purpose of assigning the Town's right-of-first refusal in the event that a key Chapter 61 parcel is put up for sale. Often land trusts are able to bring together sources of income and potential buyers of land and development rights in a shorter time frame than if the Town were to attempt it on its own. By being prepared, Warwick may be more likely to see the preservation of choice parcels of forest containing unique habitat, historic resources, scenic views, and trail systems. Other gaps in Warwick's protected lands include pastures and open fields.

Although one of Warwick's active farms, Chase Hill Farm, now has its farmland protected under the Agricultural Preservation Restriction (APR) Program, there are many other unprotected agricultural lands in Warwick. No additional farmland has been protected from development since the 2010 Open Space and Recreation Plan, though there has been an increase in farmland enrolled in the Chapter 61A (Agriculture) program providing temporary protection. The fields most at risk are rarely the ones protected. Usually, it is the marginal field, or the one too close to other houses that farmers choose to sell to developers, while the APR Program typically works with active farms and requires the presence of prime farmland soils. Farmers sometimes use frontage lots as a means of funding operations during slow years. Many of these fields have prime farmland soils, even if they are not actively farmed. The 2016 Farmland Inventory prepared by Mount Grace Land Conservation Trust identified 619 acres of active farm fields in Warwick, but only 41% of these acres are protected.

Climate change and its impacts on Warwick's natural resources has been a central focus of this Open Space and Recreation Plan update. Natural resources, including wildlife and habitats, are being impacted from a changing climate in Massachusetts, and will continue to be impacted as temperatures rise and precipitation patterns change over the coming decades. At the same time, these natural resources help mitigate the impacts of climate change, including sequestering and storing carbon and absorbing and reducing flood waters. Warwick contains a large amount of BioMap 2 Core Habitat and Supporting Natural Landscape areas that support and promote biodiversity and habitats for species of special concern in the State. Warwick is fortunate to have a large amount of contiguous forest that is important for the migration of species northward as the climate changes. Warwick's cold water fisheries provide important habitat to species needing cooler water temperatures, and may be particularly vulnerable to the changing climate.

While climate change will continue to be a major challenge globally, local efforts and decisions have real and lasting impacts on mitigating and adapting to future climate change. One of the most effective, and least costly, strategies is to preserve existing natural areas and manage them for increased resilience to climate change. There are a number of new tools available to Warwick to assess and prioritize parcels for protection based on climate resiliency and other factors. These tools are highlighted in Section 4 of this plan.

Clean drinking water is important to residents. Ground water pollution is a concern as all areas in town are served by private wells. The potential sources of contamination of private wells in Warwick are on-site septic systems, sub-surface fuel tanks, manure piles, feed lots, and driveways and runoff of road salt or other contaminants such as herbicides, pesticides, and pathogens. These are all examples of non-point source pollution. In 2017, a low salt/no sand

area was re-established in the center of Town to help protect private wells that are close to the road. Signs have been erected regarding the use of low salt in this area. In 2017, Town Meeting approved a town-wide ban on the use of the herbicide class 2-4-D (commonly called RoundUp) and glyphosate, which has been linked to cancer in humans. These and other practices should be continued and monitored for effectiveness.

New development in Warwick continues at a slow pace. Between 2009 and 2017, eight new homes were permitted in town. A newer form of development that has the potential to impact Warwick's natural resources and open spaces are large-scale solar installations. A number of towns in the region have adopted zoning bylaws to regulate the siting, construction, maintenance, and decommissioning of large-scale ground-mounted solar installations. These bylaws seek to minimize potential negative impacts of large installations while also encouraging renewable energy by identifying areas in town where these systems would be most appropriate. Warwick does not currently have zoning in place to regulate this type of development.

Warwick does not have a public water supply for fighting fires. Sixty-three percent of respondents to the Open Space Survey supported developing more fire ponds and dry hydrants for fire-fighting purposes, while 32 percent of respondents were unsure.

B. SUMMARY OF COMMUNITY'S NEEDS

When asked which aspects of life in Warwick mean the most to them, survey respondents chose "quiet" as their top choice. The next most popular choice was "the people." Warwick is a small, rural town with a strong sense of community. Residents place great emphasis on protecting the rural character of the town and also promoting a vibrant community that includes recreational opportunities as well as educational and cultural experiences for residents.

B.1 Overall Recreation Needs

Warwick residents' favorite recreational activities pursued in Warwick, according to the survey results, are (ranked by popularity): walking, hiking, bird watching, gardening, swimming, boating (non-power), and snow shoeing. Many of these activities are already provided for at the areas in town most often used for recreational activities: Laurel Lake Beach, Sheomet Pond, Moores Pond Beach, Mt. Grace trails and Ohlson Field. Open fields, forests and trails, access to State forests, and recreational opportunities were identified by a majority of survey respondents as either very important or important in their decision to live in Warwick. The top activities survey respondents chose to encourage in Warwick are hiking, swimming, fishing, horseback riding, and road biking. Open Space Committee members have noted that walking, hiking, and equestrian opportunities could be improved through new trail construction, creation of trail maps, and better maintenance of the dirt roads and trails on State Forest lands.

In the survey, Warwick residents identified a need for creating opportunities for people to meet and recreate together. This need was identified in the Open Space Survey even though most respondents felt that the town's sense of community has remained the same or has changed for the better. The need for a place to gather to talk and recreate has consistently been identified in

Open Space and Recreation Surveys over the past 20 years. In past surveys, respondents offered potential ways of creating a stronger sense of community including a store, café, and a sports program for young people. In the 2019 survey, respondents also focused on the needs of the growing senior population, with suggestions for use of Town-owned buildings for senior housing, a senior center, or a community center that could provide arts, crafts, and cultural programming for all ages. The Town Hall is the current venue for community events and activities.

There is overwhelming support in this survey and past surveys for passive recreation and open space on town lands. In addition, use of Town land for sustainable forest management, active recreation (tennis, softball, etc.), community buildings, and community infrastructure (water, sewer, etc.) were supported by a majority of survey respondents. Most respondents were opposed to leasing Town land for private development or for institutional or commercial development. There was roughly an equal amount of support and opposition for use of town land for low income housing, or leasing for private recreation.

On state land there was most support expressed for wildlife habitat and biodiversity, hiking, swimming, fishing, and softball/baseball/soccer/football fields. Respondents were more divided in support for recreational activities such as trail riding, skiing, camping, tennis/badminton courts, boating, mountain biking, volleyball courts, and snow-mobiling. Respondents were mostly opposed to the Commonwealth developing four wheeling (off-road vehicles), dirt biking and commercial institutions.

In both this Open Space and Recreation Survey and previous surveys, the overwhelming majority felt there was a need to identify and protect archeological and historic sites in town. Support for making the sites more accessible was supported by 63% of respondents, but 29% were unsure, and 8% were opposed to making these sites more accessible, which suggests the need to make sites more accessible requires sensitive handling.

There is not clear support for Warwick to try to obtain trail rights through private property. While 42% of survey respondents support obtaining trail rights, 21% are opposed, and 37% are unsure, which suggests there may be a need for public education about trail easements on private land. Interestingly, there was more support for publicly-funded trail maintenance (55%), though 21% of respondents were opposed and 24% were unsure. This is a change from past surveys, where the majority of respondents opposed publicly-funded trail maintenance.

Although economic development issues are typically addressed in Master Plans, Warwick Open Space and Recreation survey respondents were very clear about the need to support cottage industries with better telecommunications and other methods without encouraging separate industrial and commercial zoning districts.

B.2 Open Space and Recreation Needs of Town Facilities

There are no lands or facilities under the control of the Recreation Committee. The Warwick Community School has a playground, basketball courts and soccer fields, which are open to public use when school is not in session. There are two parcels of land under the control of the

Conservation Commission. These two parcels were assessed for their resources, accessibility needs, and recommendations for modifications (see Appendix D). The remote 8.6 acre Black Gum Swamp is an interior holding that was acquired by the Conservation Commission as a unique habitat containing threatened plant communities. While there are plans to make the site accessible by a loop trail off an existing trail on DCR state forest land (which it abuts) at some future date, it probably will not happen for some years.

In 2017, the Town acquired the Victoria Shaw lot, expanding the Town Forest and connecting the Black Gum parcel with the existing Town Forest Reservation on Wendell Road. The Open Space Committee is interested in creating trails on the Town Forest parcels to link these Town-owned open space resources. The Open Space Committee could also assess Town-owned open space parcels for the potential to create a handicap accessible trail. A local example of an accessible loop trail was recently completed by Mount Grace Land Conservation Trust at their Alderbrook Meadows Wildlife Sanctuary in Northfield, with funding from the Massachusetts Department of Conservation and Recreation (DCR) Recreational Trails grant.

The 36 acre Hockanum Hill Conservation Area property was acquired in 2004 on Hockanum Hill to protect public access to the existing trail that leads to the “Overlook,” and also to protect a heavily used wildlife corridor along the ridgeline. This green corridor consists of mostly large permanently protected tracts of the Orange State Forest and the Warwick State Forest and runs for about 6 miles. Just off the edge of the road, a small log landing tucked in the woods at the base of a steep slope was converted to a parking area for 6 vehicles. There is a small sign indicating where the parking area is and another small sign indicating where the trail starts. The area is primitive, with only the trail and parking area. There are no picnic tables or trash barrels and the parking area is very muddy during the Spring. The parking area is the only relatively flat land in the area. The trail is steep and starts at the edge of the parking area. The “overlook” has become overgrown with trees, and the Conservation Commission and Open Space Committee is considering the possibility of trimming this area to reopen the views. The Conservation Commission is also considering a loop trail on the parcel.

Survey respondents were generally interested in participating in environmental education activities if made available in town, including bird walks, vernal pool walks, and forestry demonstration, as well as a number of other identified areas of interest. Several comments from the 2019 survey noted the need for sidewalks along busy roads in town such as Route 78. Several survey respondents noted that having sidewalks on some roads in town would encourage more people to walk and recreate who may not be able or willing to walk in the woods. Other comments reflected a need for transportation assistance for seniors and persons with disabilities.

Needs Identified by Special Groups in Previous Open Space and Recreation Plan Updates

During the update process for the 2010 Warwick Open Space and Recreation Plan, an attempt was made to assess the needs of special groups, such as youth, elderly, and handicapped. The Chair of the Open Space Plan Committee met with elders at the senior meal site, and with the Women’s Guild, which is made up primarily of women over 55 years of age, to explain what was being done and solicit input. The top priority voiced by the elderly was a place to meet. Warwick does not have any informal gathering spot such as a coffee shop or restaurant, by and

large there was such agreement on the need for gathering spot that there were no other priorities, although beaver were mentioned and the difficulty of walking in the streets in winter because of the snow banks and lack of sidewalks. There were two meetings with youths that yielded exciting results, which are discussed in more detail, below.

The Teens List of Open Space and Recreation Ideas from the Teen Meeting (same rank indicates a tie vote):

1. Teen gathering spot (store, Ohlson Field), Swimming place, Internet and cell phone service
2. Tennis courts, Basketball court
3. Zipline
4. Rock-climbing wall and Trail map/book –showing GPS coordinates and noting access for fishing and canoeing
5. Fix Fire tower on Mt. Grace for viewing, Dirt bike (mountain bike) park
6. Trailhead journals, Zen peace garden, Camping area (Ohlson field, other)

The Warwick Community School students prepared Their Wish List:

Four-wheeling trails	Covered pavilion w/picnic tables at school
Butterfly museum	Trail journal at the top of Mt. Grace
Basketball court at old school	Access trail/board walk to Lily Pond
Playhouse/cabin at the school	Animal abandonment prevention
More fields for games	Animal natural habitat reserve/museum/mini-zoo
Hospital	Small aquarium or petting zoo
Dirt bike track	Picnic tables on Mt. Grace
Skateboard park	Tennis courts
Letterboxes, geo-caching on trails	Telescope atop Mt. Grace
Food Pantry	Trail guides and maps
Trash collection sites on trails, fields	Historical sites and Common maps
Natures Classroom	

B.3. 2017 Statewide Comprehensive Outdoor Recreation Plan (SCORP)

The Commonwealth has completed the 2017 Statewide Comprehensive Outdoor Recreation Plan (SCORP), an update of the SCORP 2012, five-year plan. SCORP plans are developed by individual states to be eligible for federal Land and Water Conservation Fund (LWCF) grants and serve as a tool for states to use in planning for future needs and uses of outdoor resources for public recreation and relaxation. The SCORP also provides information about use of and demand for outdoor recreational resources in the state that may be relevant to Warwick's open space and recreational planning efforts. The public participation process utilized three online surveys (one for recreation users, one for municipal recreation providers, and one for land trusts), public meetings throughout the state, a statistically-relevant phone survey, and a youth survey of middle

and high school students to gather information on current supply and demand for outdoor recreational resources.

The goals and objectives of the 2017 SCORP are:

1. Access for Underserved Populations:

- Support the acquisition of land and development of new open spaces in areas that lack existing or useable open spaces, such as Environmental Justice neighborhoods
- Develop parks and open spaces that offer amenities that go above and beyond ADA requirements for people with disabilities
- Consider the needs of underserved demographic groups — senior citizens and teenagers — in park and open space designs
- Encourage establishment of programming endowments

2. Support the Statewide Trails Initiative:

- Support the acquisition of land and development of new open spaces that can provide a trail network
- Fill in the gaps of existing trail networks
- Ensure that any existing or new trails are fully accessible to people with disabilities

3. Increase the Availability of Water-based Recreation:

- Support the acquisition of land that will provide for water-based recreation
- Support the acquisition of land that will increase drinking water supply protection
- Develop water-based recreational facilities, including swimming areas, spray parks, boating facilities, fishing areas, etc.

4. Support the Creation and Renovation of Neighborhood Parks:

- Promote the acquisition and development of neighborhood parks where none currently exist
- Develop amenities supported by neighborhood parks, such as playgrounds, off-leash dog parks, and community gardens
- Work with community development organizations to improve walking access to local parks

When respondents to the online survey asked which activities a member of their household planned to participate in over the next 12 months, the top responses included: walking or jogging (on trails and greenways), hiking, and walking or jogging (on streets and sidewalks). People were generally quite happy with the quality of their community's outdoor recreation facilities, with 78.1% stating that the facilities were in excellent or good shape. State facilities did slightly worse, with 75.0% rated as excellent or good.

Respondents explained what motivates them to participate in outdoor recreation. The number one response was for physical fitness, followed closely by mental well-being and being close to nature. The nearness of an outdoor recreation facility to home was the top reason that it was visited most frequently. The enjoyment of the scenery and trees and greenery were the second and third most cited driver of visitation. Even though the majority of respondents have a park or

conservation area within walking or biking distance to their residence (75.6%), the vast majority of people drive there (68.8%). This could be due to the fact that people lack time to recreate, which is the number one reason people said they do not use outdoor recreation facilities more frequently (55.5%).

Many of the municipalities that responded to the survey did not provide regular programming. When asked how important it was for more programming to be available for senior citizens, 83.7% of respondents said that it was either a somewhat or very important priority. 88.2% said that it was either a somewhat or very important priority to them that more four to 12 year old programming be offered. Even more requested is programming for teens, with 91.2% saying that it was either a somewhat or very important priority.

The top responses to the on-line survey in regard to what types of projects respondents would like to see funded in the future fall into three categories:

- 1) trails—hiking, biking, paved walkways, trails with access for people with disabilities, and mountain biking;
- 2) playgrounds—for ages 2-5, designed for people with disabilities, for ages 6-12, and for ages 6 months to 2 years; and
- 3) water—swimming pool, canoe/kayak access, and fishing areas.

Phone survey participants were asked what the top three improvements to municipal recreational facilities they would like to see. The top five responses can be broken into two categories:

- 1) water-based recreation—outdoor swimming pools or spray parks; beaches, fresh or saltwater swimming areas; canoeing/kayaking/rafting/tubing areas; fishing/ice fishing areas; and waterskiing/jet skiing areas (59.0%);
- 2) neighborhood-park-type amenities—playgrounds, picnic areas, off-leash dog parks, and community gardens (52.0%);
- 3) trails—hiking trails; paved, multi-use trails, such as rail trails; unpaved, multi-use trails, such as mountain bike trails, cross-country skiing or snowshoeing trails; off-road motorcycle or ATV trails; and snowmobiling trails (48.0%).

The youth survey indicated that the most popular outdoor activities for youth are team activities, such as soccer, football, lacrosse, field hockey, and rugby. Team sports are particularly of interest for boys and younger respondents. Girls also enjoy team sports, but like swimming pools in equal numbers. Teens between the ages of 15 and 18 are just as apt to mention swimming; hiking; and running, jogging, or walking as favorite activities. The three most common outdoor activities the respondents participated in during the past year were running, jogging, or walking; swimming (any type); and road biking. They would like to increase their participation in running and swimming. The respondents were asked how their participation in outdoor recreation could be increased. Providing recreation areas close to home, providing equipment like sports equipment, and providing recreation spaces that are “just for kids my age” were the top three responses.

Over the next five years, the Executive Office of Energy and Environmental Affairs will be engaging an active effort to work with local municipalities and state agencies to develop a

database that lists all of the amenities at each facility by region. This will help to determine where specific types of amenities should be built when it is evident that there are gaps in supply. The list can begin with municipal- and state-owned facilities. Over time, private and non-profit facilities may be added. This database could also be used by residents who are searching for a particular activity, to know where they can go to swim in a pool or play disc golf. Forty-three percent of the phone survey respondents said that they use the internet to learn about outdoor recreation facilities, resources, and activities. Therefore, the resources available on the web should be increased and more user-friendly.

C. MANAGEMENT NEEDS

Warwick is fortunate to have a great number of organizations interested in the environment and outdoor recreation in the region. There are a number of state and regional environmental organizations sponsoring land and natural resource protection projects including the New England Forestry Foundation, Mount Grace Conservation Land Trust, the Trustees of Reservations, Massachusetts Audubon Society, Division of Fisheries and Wildlife, the Department of Agricultural Resources, Harvard University, the U.S. Army Corps of Engineers, the Millers River Environmental Center, the Athol Bird and Nature Club, the Alan E. Rich Environmental Park, the North Quabbin Trails Association, and the Millers River Watershed Council. There may be a need for the Town to have the ability to facilitate and coordinate the activities that occur within Warwick so that their conservation efforts benefit local residents as much as possible. An appointed Open Space Committee has been given the responsibility to act as the liaison to these organizations reporting back to Town Officials as necessary. Similarly, if Town Officials were kept abreast of these local and regional efforts, there would be more opportunities for cooperation with adjoining towns.

One issue is the use of Town-owned lands. A majority of Open Space survey respondents feel that Town land should be used for passive recreation and open space uses. Others may want the Town forests to be managed sustainably. Creating a management plan for each Town-owned parcel via committee, which addresses different uses, may be a good first step. The Massachusetts Forest Stewardship Program provides financial and technical assistance to forest landowners, including municipalities with Town Forests and Conservation Commission lands, to create a 10-year forest stewardship plan that documents options and best management practices that will lead to a productive and healthy forest for the next generation. Once a town completes a stewardship plan, they may apply for a Community Forest Stewardship Grant to implement their plan. The purpose of the grant is to assist communities in putting forest stewardship into practice and to help connect local citizens to their forest and the benefits these forests provide, including a local source of wood products, clean water, biodiversity, and wildlife habitat.¹

In addition, Warwick may want to consider forming a Trails Committee that could work exclusively on trail development, maintenance, and events in conjunction with the Open Space Committee, Town Forest Committee, Conservation Commission, land trusts, the North Quabbin Trails Association, Appalachian Mountain Club, and volunteers. Northfield and Leverett are

¹ <https://www.mass.gov/service-details/forest-stewardship-program>

nearby communities that have active Trail Committees. The MassTrails program provides resources and funding to communities to support trail development and maintenance across the state. The MassTrails grant program funds a wide range of activities including project development, design, engineering, permitting, construction, and maintenance of recreational trails, shared use pathways, and the amenities that support trails.²

Another issue addressed in the Open Space and Recreation Plan is the question of whether to adopt potential changes in the zoning bylaw to protect the Town's rural character and encourage or discourage different uses and lot sizes. Survey respondents expressed interest in encouraging cottage industries and home businesses. With recent improvements to broadband internet service in town, it will be possible for more people to work from home, which would create a more vibrant community. A community filled with people working at home could support a local store/café/post office. Improved services might attract new residents; people who want to live and work at home in a very rural town with improved cell phone coverage and high speed Internet access. A study of potential zoning amendments and their impacts on the Town's rural character may be useful. Carrying out such a study, and discussing its results in regards to potential zoning amendments or changes, may be a way to build consensus on the most appropriate tools for conserving Warwick's rural character while facing potential increases in population.

Gaining consensus among people with strong positions and feelings can take time, resources, and the commitment of each participant in the group. Gaining consensus requires good leadership, communication, and an understanding that tradeoffs on both sides are required to resolve conflict. Although it may seem to be a daunting task, the effort a community invests in reaching consensus on a course of action will help to ensure broad support for the most appropriate action step to a well understood and defined objective.

² <https://www.mass.gov/welcome-to-masstrails>

SECTION 8

GOALS AND OBJECTIVES

The following goals and objectives were formulated from the results of the 2019 Warwick Open Space and Recreation Planning Survey and were reviewed and modified through the public meetings of the Open Space Committee, the public forum process, and associated public comment.

A. Ensure that the Town of Warwick retains its rural, safe and quiet, small town character and sense of community, and its agricultural, cultural, historic and architectural resources.

1. Support the continued development of festivals and events to provide residents with opportunities to get to know their own community.
2. Ensure that Town-owned open space is used for recreation, open space, sustainable forest management, and other community uses supported by residents.
3. Construct and maintain an appropriate number of fire ponds and dry hydrants throughout the town.
4. Work with the Warwick Historical Society to inventory, protect and, where appropriate, make more accessible, significant historical and archaeological sites.
5. Study current community use of Town buildings and explore options for creating or increasing use of space that would serve as a meeting place for residents
6. Develop a self-guided walking tour map that shows the cultural resources of the historic center of Warwick.
7. Permanently protect farmland through conservation restrictions or the Agricultural Preservation Restriction Program (APR).

B. Ensure that the Town of Warwick maintains or improves the quality of its air and water, and the diversity and integrity of native fauna and flora through the conservation of locally important natural, open space.

1. Prioritize town sponsored land conservation projects and consider zoning changes that conserve open fields, farmland, forest land, streams, ponds, wetland, woods roads and trails, scenic vistas, and the town center.
2. Accept or purchase land and easement donations and facilitate the activities of land trusts in the region.
3. Take advantage of, or assign to a qualified non-profit, the Town's right-of-first refusal for protection of high priority Chap. 61, 61A, and 61B lands.
4. Develop a Land Protection Education program for townspeople to include estate planning, land conservation options, and presentations by regional land trusts.

5. Promote state and private investment in the conservation of local and regional forested landscapes to conserve unique habitats of statewide importance, the value of which would be reduced significantly by development within the region.
6. Inventory and work to develop the best methods for protecting special ecological, historical, and recreational resources in Warwick.
7. Consider changes to Zoning bylaws and Board of Health regulations to better protect the public health and water quality by reducing the possibility of failed septic systems.
8. Prepare a Cost of Community Services (COCS) study for the Town of Warwick.
9. Protect wildlife corridor highway crossings.
10. Eliminate ATV damage to woods roads and trails on state and town land and cooperate with private land owners to limit damage on their land.
11. Minimize the impacts of invasive species.
12. Minimize beaver damage to high value capital resources and where public health or safety is threatened.

C. Ensure that the Town of Warwick maintains or improves the current quality, quantity, and accessibility of its recreational resources.

1. Identify and assess purchasing particular open space areas that could potentially provide public access to a valued recreational resource.
2. Consider the development of recreational resources for seniors and persons with disabilities.
3. Encourage the Department of Conservation & Recreation (DCR) to develop recreational facilities on state forestlands to support public use of this resource for passive recreation.
4. Continue recreational programming on Town owned lands to promote outdoor recreation and environmental education.
5. Plan a trail system and trail map for Warwick to link recreation and community resources.
6. Survey and mark boundaries of Town owned land.

D. Ensure the economic stability of the community by developing supportive infrastructure and encouraging economic activity compatible with the rural character of the town.

1. Encourage cottage industries and locally based economic activities.
2. Encourage big and small farming.
3. Explore changes to zoning to protect homes and farms from adverse impacts on land use patterns by institutional or industrial development.
4. Consider acquiring more Town Forest land to provide income from timber harvests and carbon sequestration.

SECTION

9

SEVEN YEAR ACTION PLAN

The Seven Year Action Plan proposes specific activities that can be implemented by a variety of town boards, committees and state agencies to enable the town to achieve its open space and recreation goals and objectives, which have been identified in Section 8 and elsewhere in this Plan. Table 9-1 lists the objectives in the same order as they appear in Section 8 and are followed by recommended actions, responsible board or group, and start date. As shown in the fourth column in Table 9-1, the Open Space Committee, Select Board, Planning Board, Board of Health, Conservation Commission, the Historical Society, and others are all necessary participants in the successful implementation of Warwick's Open Space and Recreation Plan.

Most of these actions may be constrained by a lack of volunteer time, rather than funding. Where money is required, such as to permanently protect open space, it does not have to be provided by the Town alone. State and federal governmental agencies, private non-profit conservation organizations, and foundations are potential sources of funding, as described in Section 5. In addition, these sources are more likely to invest in land protection projects that have a broad base of community support.

Despite being a small town relying on a small number of staff and many dedicated volunteers, Warwick has accomplished a number of action items from the previous Open Space and Recreation Plan. The following list summarizes these accomplishments, which may be either completed or ongoing activities:

- Warwick passed a Right to Farm bylaw in 2010.
- The Town acquired the Victoria Shaw property in 2017, adding 88 acres to the Warwick Town Forest. The Open Space Committee continues to identify parcels of land for protection.
- The Town completed acquisition of the Moores Pond beach property in 2010. A Town Beach Committee raises funds for bacteria monitoring and organizes volunteer cleanup days.
- Since the last update to the Warwick Open Space and Recreation Plan, at least 30 vernal pools have been certified by the Warwick Conservation Commission. The Commission holds an annual vernal pool day in the spring to help educate residents about vernal pools.
- The Open Space Committee hosts hikes during Warwick Old Home Day.
- Mount Grace Land Conservation Trust (MGLCT) held a farm event at Town Hall and the Library; a Warwick farm inventory was completed by MGLCT in 2016.
- The Town Hall is open once a week for seniors to convene for coffee and lunch.
- Expanded options for recreation classes and events are offered through the Recreation Committee and the Council on Aging.
- The Open Space Committee compiled a handbook of Warwick Town Forest parcels in 2017.

Under the primary stewardship of the Open Space Committee, all of the action steps listed below could be achieved over time. However, it is important to establish priorities for the first seven years. The Open Space Plan Committee, with help from the January 2020 forum participants, prioritized the most important Objectives, listed below. These Objectives and associated Action Items are also represented graphically on the Seven Year Action Plan Map, and are highlighted in Table 9-1.

The top Objectives identified as the highest priority at the Open Space and Recreation Public Forum are (in order of priority):

- C.5. Plan a trail system and trail map for Warwick to link recreation and community resources.
- D.1. Encourage cottage industries and locally based economic activities.
- D.2. Encourage big and small farming.
- A.2. Ensure that Town-owned open space is used for recreation, open space, sustainable forest management, and other community uses supported by residents.
- B.10. Eliminate ATV damage to woods roads and trails on state and town land and cooperate with private land owners to limit damage on their land.
- B.1. Prioritize town sponsored land conservation projects and consider zoning changes that conserve open fields, farmland, forest land, streams, ponds, wetland, woods roads and trails, scenic vistas, and the town center.
- B.11. Minimize the impacts of invasive species.

Table 9-1: Recommended Actions of the Open Space and Recreation Plan (Top Priority Objectives and Action Items are Shaded Green)

OBJECTIVE	ACTION	RESPONSIBLE BOARD or GROUP	START DATE ¹	POTENTIAL FUNDING SOURCES ²
Goal A. Ensure that the Town of Warwick retains its rural, safe and quiet, small town character and sense of community, and its agricultural, cultural, historic and architectural resources.				
A.1. Support the continued development of festivals and events to provide residents with opportunities to get to know their own community.	Participate with other town organizations and committees to develop festivals and events.	Open Space Committee	2020 – 2027	Volunteer time
	Promote the work of the Open Space Committee, where appropriate.	Open Space Committee	2020 - 2027	Volunteer time
	Continue to host Warwick Old Home Day hikes and cemetery walks	Open Space Committee Historical Society Cemetery Commission	2020 - 2027	Volunteer time
	Continue to work with Mount Grace Land Conservation Trust and other groups to host events that promote rural working landscapes	Open Space Committee Town Forest Committee Agricultural Commission Warwick Free Public Library Warwick Community School	2020 - 2027	Volunteer time

¹ For action items that are considered to be ongoing efforts, the start date is given as 2010-2017. For other action items, a start date is given but no end date is set because the implementation of the action items is a fluid process. Many of the action items can be worked on simultaneously. Also, the start date for a given action item is not set in stone. The Responsible Board/Group could change the start date for a specific action item, as it deems appropriate, after consultation with the Open Space Committee.

² Like many small towns, Warwick relies heavily on its dedicated, knowledgeable and unpaid volunteers who contribute countless and priceless hours to various town boards, commissions, causes and projects. Volunteer time is noted for those goals and objectives that would otherwise not be accomplished due to lack of town, state and/or federal government funding for specific projects or lack of funding for technical assistance and other services that non-profit organizations, the regional planning agency and/or state agencies could provide to the town.

OBJECTIVE	ACTION	RESPONSIBLE BOARD or GROUP	START DATE¹	POTENTIAL FUNDING SOURCES²
A.2. Ensure that Town-owned open space is used for recreation, open space, sustainable forest management, and other community uses supported by residents.	Develop management plans for Town-owned open space with community input.	Conservation Commission Town Forest Committee Open Space Committee	2021	Volunteer time DCR Forest Stewardship Program
	Seek funding to implement management goals, such as wildlife habitat, sustainable forestry, trail development, etc.	Conservation Commission, Town Forest Committee, Open Space Committee	2023	Volunteer time DCR Community Forest Stewardship Grant MassTrails Grant
	Explore amending the town's bylaws with a provision that supports the use of Town-owned land for commercial development that is compatible with community goals.	Planning Board	2023	Volunteer time
A.3. Construct and maintain an appropriate number of fire ponds and dry hydrants throughout the town.	Review needs for fire ponds and dry hydrants.	Fire Department and Town Coordinator; Conservation Commission	2021	Town funds; Volunteer time
	Continue to upgrade and improve fire ponds and dry hydrants throughout town.	Fire Department and Town Coordinator; Conservation Commission	2020 - 2027	Town funds; Volunteer time
	Seek grants to support the development of fire ponds and dry hydrants.	Town Coordinator	2022	Town funds

OBJECTIVE	ACTION	RESPONSIBLE BOARD or GROUP	START DATE¹	POTENTIAL FUNDING SOURCES²
A.4. Work with the Warwick Historical Society to inventory, protect and, where appropriate, make more accessible, significant historical and archaeological sites.	Seek out volunteers in Town who could assist in the creation and publishing of a map showing the locations of these historical, geological, and archaeological sites. Utilize teens and other volunteers to GPS sites.	Planning Board, Warwick Historical Society, Open Space Committee, Cemetery Commission	2023	Volunteer time
	Continue to offer hikes to historical and archeological sites.	Warwick Free Public Library Open Space Committee	2020-2027	Volunteer time
	Consider the creation of a Historic District for the center of Town.	Planning Board; Warwick Historic Commission; Warwick Historical Society; Select Board	2023	Volunteer time MHC Planning Grant
A.5. Study current community use of Town buildings and explore options for creating or increasing use of space that would serve as a meeting place for residents	Set up a Committee to define meeting place needs and options. Ensure the needs of youths, teenagers, and seniors are addressed.	Select Board	2020	Volunteer time
A.6. Develop a self-guided walking tour map that shows the cultural resources of the historic center of Warwick.	Utilize teens and other volunteers to GPS sites; consider using teens and elementary school children to help design and illustrate the tour map.	Open Space Committee; Warwick Historical Society; Cemetery Commission	2021	Volunteer time

OBJECTIVE	ACTION	RESPONSIBLE BOARD or GROUP	START DATE ¹	POTENTIAL FUNDING SOURCES ²
A.7. Permanently protect farmland through conservation restrictions or the Agricultural Preservation Restriction Program (APR).	Utilizing the 2016 Warwick Farmland Inventory, work with the staff of the Farmland Conservation Program at MGLCT to prioritize farmland parcels for protection and facilitate discussions with land owners to permanently protect Warwick farmland; request MGLCT's assistance with applications to the APR program for eligible parcels.	Open Space Committee; Conservation Commission; Agricultural Commission; Assessor	2022	Volunteer time; MGLCT Agricultural Preservation Restriction (APR) Program
Goal B. Ensure that the Town of Warwick maintains or improves the quality of its air and water, and the diversity and integrity of native fauna and flora through the conservation of locally important natural, open space.				
B.1. Prioritize town sponsored land conservation projects and consider zoning changes that conserve open fields, farmland, forest land, streams, ponds, wetland, woods roads and trails, scenic vistas, and the town center.	Identify parcels of land important to conserve or that are at risk of losing conservation values.	Open Space Committee Conservation Commission	2020 - 2027	Volunteer time
	Develop a large scale solar PV bylaw to limit impacts on natural resources and direct this type of development to appropriate areas of town.	Planning Board	2020	Volunteer time DLTA
	Work with the Franklin Regional Council of Governments to identify and adopt innovative zoning techniques to achieve the town's goals for land conservation.	Planning Board; Open Space Committee; Franklin Regional Council of Governments	2020 - 2027	Volunteer time DLTA EEA Planning Grant

OBJECTIVE	ACTION	RESPONSIBLE BOARD or GROUP	START DATE¹	POTENTIAL FUNDING SOURCES²
B.2. Accept or purchase land and easement donations and facilitate the activities of land trusts in the region.	Maintain liaison with local and regional land trusts and the North Quabbin Landscape Partnership.	Select Board, Conservation Commission, Open Space Committee, Assessor	2020 - 2027	Volunteer time
	Develop criteria for evaluating offers of land or easements, identify and secure funding sources for open space acquisition.	Select Board, Conservation Commission, Open Space Committee, Assessor	2022	Volunteer time
	Update Criteria for Acquisition of Unprotected Land (Section 5) as new information becomes available.	Open Space Committee	2020 - 2027	Volunteer time
B. 3. Take advantage of, or assign to a qualified non-profit, the Town's right-of-first refusal for protection of high priority Chap. 61, 61A, and 61B lands.	Adopt a protocol for Chapter 61, 61A, and 61B right of first refusal.	Select Board; Open Space Committee; Conservation Commission; Town Forest Committee	2021	Volunteer time
	Identify parcels currently enrolled in Chapter 61, 61A, and 61B that are a high priority for protection if they were to become available.	Open Space Committee Conservation Commission Town Forest Committee	2022	Volunteer time

OBJECTIVE	ACTION	RESPONSIBLE BOARD or GROUP	START DATE¹	POTENTIAL FUNDING SOURCES²
B.4. Develop a Land Protection Education program for townspeople to include estate planning, land conservation options, and presentations by regional land trusts.	Insert available literature, weblinks, and brochures on land conservation alternatives in the Warwick Community Newsletter and at the Warwick Free Public Library.	Open Space Committee, Mount Grace Land Conservation Trust, Warwick Free Public Library	2020 - 2027	Volunteer time; Town funds
	Collect and submit publications to the Warwick Free Library that would help residents learn about conservation topics and land protection alternatives.	Open Space Committee, Mount Grace Land Conservation Trust, Warwick Free Public Library	2020 - 2027	Volunteer time; Town funds
	Develop educational programs for landowners and help publicize events via phone, bulletin boards at the Town Hall and Library, and use the newsletter as a vehicle for notification.	Open Space Committee, Mount Grace Land Conservation Trust, Warwick Free Public Library	2020 - 2027	Volunteer time; Town funds
B. 5. Promote state and private investment in the conservation of local and regional forested landscapes to conserve unique habitats of statewide importance, the value of which would be reduced significantly by development within the region.	Utilize tools such as MassAudubon's Mapping and Prioritizing Parcels for Resilience (MAPPR) to promote state and private land protection efforts through the action steps of B.4.	Open Space Committee	2020 - 2027	Volunteer time; Town funds
	Seek endorsement from the North Quabbin Regional Landscape Partnership (NQRLP) for Warwick projects, and request project assistance from NQRLP staff.	Open Space Committee	2020 - 2027	Volunteer time; NQRLP grants

OBJECTIVE	ACTION	RESPONSIBLE BOARD or GROUP	START DATE¹	POTENTIAL FUNDING SOURCES²
B.6. Inventory and work to develop the best methods for protecting special ecological, historical, and recreational resources in Warwick.	Ensure the inventory of ecological, historical, and recreational resources is complete.	Open Space Committee, Conservation Commission, Historical Society, Cemetery Commission	2021	Volunteer time
	Participate in Biodiversity Days. Encourage Warwick Community School students and teens to participate in Biodiversity Days.	Open Space Committee Conservation Commission	2020-2027	Volunteer time
	Continue to certify vernal pools. Continue vernal pool days. Enlist the help of teens and Warwick Community School students to certify vernal pools.	Conservation Commission	2020 - 2027	Volunteer time
	Utilizing BioMap2, prioritize high quality biological resources for protection and initiate partnerships with a suitable land trust or state agency to facilitate permanent protection of the resources.	Open Space Committee	2023	Volunteer time
B. 7. Consider changes to Zoning bylaws and Board of Health regulations to better protect the public health and water quality by reducing the possibility of failed septic systems.	Review the health threats of on-site sewer to private wells, surface and groundwater resources, and the public health in general.	Board of Health and Planning Board	2020	Volunteer time; Town funds; DEP brochures, literatures and/or grants

OBJECTIVE	ACTION	RESPONSIBLE BOARD or GROUP	START DATE¹	POTENTIAL FUNDING SOURCES²
B.8. Prepare a Cost of Community Services (COCS) study for the Town of Warwick.	Consider hiring the American Farmlands Trust to prepare the COCS.	Open Space Committee and Planning Board	2024	Town funds; foundation grants
	Publicize the results of the COCS in the newsletter and/or through a public forum.	Open Space Committee and Planning Board	2025	Volunteer time
B.9. Protect wildlife corridor highway crossings	Install “Turtle Crossing” signs each season. Engage Warwick Community School students to make “Turtle Crossing” signs.	Highway Department; Conservation Commission; Warwick Community School	2020 - 2027	Town funds; donations; Volunteer time
	Continue to inventory culverts that need to be upgraded. When replacing culverts, meet the MA Stream Crossing Standards to promote fish and wildlife movement and flood resiliency, when feasible.	Highway Department Conservation Commission	2020 - 2027	Town funds; Volunteer time MA DER Culvert Replacement Municipal Assistance Grant
	Prioritize migration hotspots across roads; evaluate the need for more “wildlife crossing” signs, such as moose crossing.	Highway Department Conservation Commission	2020 - 2027	Town funds; donations; Volunteer time
B.10. Eliminate ATV damage to woods roads and trails on state and town land and cooperate with private land owners to limit damage on their land.	Inventory sections of woods roads and trails where damage is occurring.	DCR Open Space Committee Conservation Commission Newly formed Trail Committee (see Objective C.5)	2023	Volunteer time; Town funds; DCR staff time

OBJECTIVE	ACTION	RESPONSIBLE BOARD or GROUP	START DATE¹	POTENTIAL FUNDING SOURCES²
		snowmobile clubs		
	Request enforcement from DCR on State land.	DCR Open Space Committee Conservation Commission Trail Committee	2020 - 2027	Volunteer time DCR staff time
	Post Town Land and, where appropriate, block ATV access.	DCR Open Space Committee Conservation Commission Newly formed Trail Committee	2024	Volunteer time
	Organize volunteer work crews to repair damaged areas.	DCR Open Space Committee Conservation Commission Newly formed Trail Committee	2024	Volunteer time
B.11. Minimize the impacts of invasive species and pests.	Inventory and prioritize species threats and develop control options; Organize volunteer crews to implement control options.	Conservation Commission	2021	Volunteer time
	Educate the public about the species and their threats; initiate a town-wide invasive species awareness day.	Conservation Commission	2020 - 2027	Volunteer time

OBJECTIVE	ACTION	RESPONSIBLE BOARD or GROUP	START DATE¹	POTENTIAL FUNDING SOURCES²
	Organize an educational event about forest stressors including invasive species and insects, and steps landowners can take to address them.	Conservation Commission; Town Forest Committee; MGLCT; UMass Extension	2021	Volunteer time UMass
B.12. Minimize beaver damage to high value capital resources and where public health or safety is threatened.	Inventory beaver damage locations. Evaluate areas of impacts and discuss mitigation options with Massachusetts Fish and Game.	Board of Health Conservation Commission Warwick Highway Department MA Fish & Game	2020 - 2027	Town funds; Volunteer time; MA Fish and Game staff time
Goal C. Ensure that the Town of Warwick maintains or improves the current quality, quantity, and accessibility of its recreational resources.				
C.1. Identify and assess purchasing particular open space areas that could potentially provide public access to a valued recreational resource.	Inventory and assess parcels that create access or linkages between key Town-owned open space areas.	Conservation Commission; Recreation Committee; Open Space Committee; Town Forest Committee	2022	Volunteer time
C.2. Consider the development of recreational resources for seniors and persons with disabilities	Implement priority ADA improvements to Town recreation facilities and programming	Council on Aging, Trinitarian Church, Recreation Committee, North Quabbin Trails Association	2020 - 2027	Volunteer time PARC grant


OBJECTIVE	ACTION	RESPONSIBLE BOARD or GROUP	START DATE¹	POTENTIAL FUNDING SOURCES²
C.3. Encourage the Department of Conservation & Recreation (DCR) to develop recreational facilities on state forestlands to support public use of this resource for passive recreation.	Support public use of these resources for passive recreation.	Open Space Committee; Recreation Committee; Newly formed Trail Committee	2020 - 2027	Volunteer time
	Assist DCR in developing protocols for more controversial uses such as motorized recreation and mountain biking.	Open Space Committee; Recreation Committee; Select Board; Newly formed Trail Committee	2024	Volunteer time
C.4. Continue recreational programming on Town owned lands to promote outdoor recreation and environmental education	Offer additional environmental education opportunities such as bird walks, vernal pool walks, forestry demonstration, animal tracking, etc.	Recreation Committee; Conservation Commission; Town Forest Committee; Warwick Free Public Library	2020 - 2027	Volunteer time
	Encourage teens to provide input on desired recreation activities and programming.	Recreation Committee; Warwick Community School	2020-2027	Volunteer time
C.5. Plan a trail system and trail map for Warwick to link recreation and community resources	Establish a Trail Committee. Encourage youth to participate in the Trail Committee.	Selectboard; Open Space Committee; Recreation Committee; snowmobile clubs; Warwick Community School; Town Forest Committee	2021	Volunteer time

OBJECTIVE	ACTION	RESPONSIBLE BOARD or GROUP	START DATE¹	POTENTIAL FUNDING SOURCES²
	Map trails using GPS and GIS techniques; engage youth and others in mapping trails.	Trail Committee; Open Space Committee; Warwick Community School	2020-2027	Volunteer time
	Assess Town Forest parcels for trail development, including a possible loop trail on the Hockanum Hill Conservation Area parcel, and on the newly acquired Victoria Shaw parcel. Apply for funding for trail design and development.	Trail Committee Open Space Committee Conservation Commission Town Forest Committee	2020-2027	Volunteer time Mass Trails Grant
	Identify parcels needing trail easements and seek assistance in acquiring them.	Trail Committee Open Space Committee MGLCT	2020-2027	Volunteer time
	Establish a hiking club at the Community School	Trail Committee Recreation Committee Open Space Committee	2021	Volunteer time
	Coordinate efforts with equestrian interests and snowmobilers.	Trail Committee Recreation Committee	2020-2027	Volunteer time
C.6. Survey and mark boundaries of Town owned land.	Continue delineating boundaries of town parcels with possible assistance of youths, and install boundary markers.	Open Space Committee; Town Forest Committee	2020-2027	Volunteer time; Town funds


OBJECTIVE	ACTION	RESPONSIBLE BOARD or GROUP	START DATE ¹	POTENTIAL FUNDING SOURCES ²
Goal D. Ensure the economic stability of the community by developing supportive infrastructure and encouraging economic activity compatible with the rural character of the town.				
D.1. Encourage cottage industries and locally based economic activities	Explore zoning revisions or adoption of measures that would encourage small business development without detracting from Warwick's rural character.	Planning Board	2020-2027	Volunteer time
	Promote the use of the community kitchen at the Warwick Town Hall for small-batch processing of value added products	Agricultural Commission MGLCT Open Space Committee	2020-2027	Volunteer time
D.2. Encourage big and small farming	Celebrate and promote local farms through printed materials and events, such as a farm tour. Update the brochure of Warwick farms to include in regional promotion of farms and local food.	Agricultural Commission, MGLCT	2020-2027	Volunteer time
	Work with land trusts and local farm organizations to connect farmers to landowners willing to lease their land for farming.	Agricultural Commission, MGLCT	2022	Volunteer time
D.3. Explore changes to zoning to protect homes and farms from adverse impacts on land use patterns by institutional or industrial development.	Work with the FRCOG to develop a large-scale solar installation bylaw.	Planning Board	2020	Volunteer time; FRCOG Local Technical Assistance (LTA) grant

OBJECTIVE	ACTION	RESPONSIBLE BOARD or GROUP	START DATE¹	POTENTIAL FUNDING SOURCES²
D.4. Consider acquiring more Town Forest land to provide income from timber harvests and carbon sequestration.	Identify priority parcels and work with willing landowners on potential acquisition.	Open Space Committee; Town Forest Committee	2020-2027	Volunteer time
	Seek assistance from conservation non-profits and state agencies to maximize outside funding sources in order to minimize the cost to Warwick residents of Town forest land acquisition.	Open Space Committee; Town Forest Committee	2020-2027	Volunteer time
	Explore the potential of enrolling Warwick's Town Forest land in a carbon market project to earn additional income. Encourage private landowners to participate.	Open Space Committee Town Forest Committee Selectboard	2021	Volunteer time DCR

- Inventory sections of woods roads and trails where damage is occurring.
- Request enforcement from DCR on State land.
- Post Town Land and, where appropriate, block ATV access.
- Organize volunteer work crews to repair damaged areas.



- Develop management plans for Town-owned open space with community input.
- Seek funding to implement management goals, such as wildlife habitat, sustainable forestry, trail development, etc.
- Explore amending the town's bylaws with a provision that supports the use of Town-owned land for commercial development that is compatible with community goals.



- Identify parcels of land important to conserve or that are at risk of losing conservation values.
- Develop a large scale solar PV bylaw to limit impacts on natural resources and direct this type of development to appropriate areas of town.
- Work with the Franklin Regional Council of Governments to identify and adopt innovative zoning techniques to achieve the town's goals for land conservation.



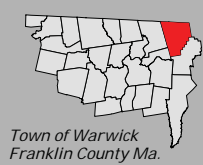
- Explore zoning revisions or adoption of measures that would encourage small business development without detracting from Warwick's rural character.
- Promote the use of the community kitchen at the Warwick Town Hall for small-batch processing of value added products.

- Celebrate and promote local farms through printed materials and events. Update the brochure of Warwick farms to include in regional promotion of farms and local food.

- Inventory and prioritize species threats and develop control options; Organize volunteer crews to implement control options.
- Educate the public about the species and their threats; initiate a town-wide invasive species awareness day.



- Establish a Trail Committee. Encourage youth to participate in the Trail Committee.
- Map trails using GPS and GIS techniques; engage youth and others in mapping trails.
- Assess Town Forest parcels for trail development, including a possible loop trail on the Hockanum Hill Conservation Area parcel, and on the newly acquired Victoria Shaw parcel. Apply for funding for trail design and development.
- Identify parcels needing trail easements and seek assistance in acquiring them.
- Establish a hiking club at the Community School
- Coordinate efforts with equestrian interests and snowmobilers.



Sources: Map produced by the Franklin Regional
Council of Governments Planning Department.
GIS data sources include MassDOT, MassGIS and FRCOG.
Depicted boundaries are approximate and are intended
for planning purposes only, not to be used for survey.

January, 2020

Action Plan

Franklin Regional
Council of Governments

SECTION 10

PUBLIC COMMENT

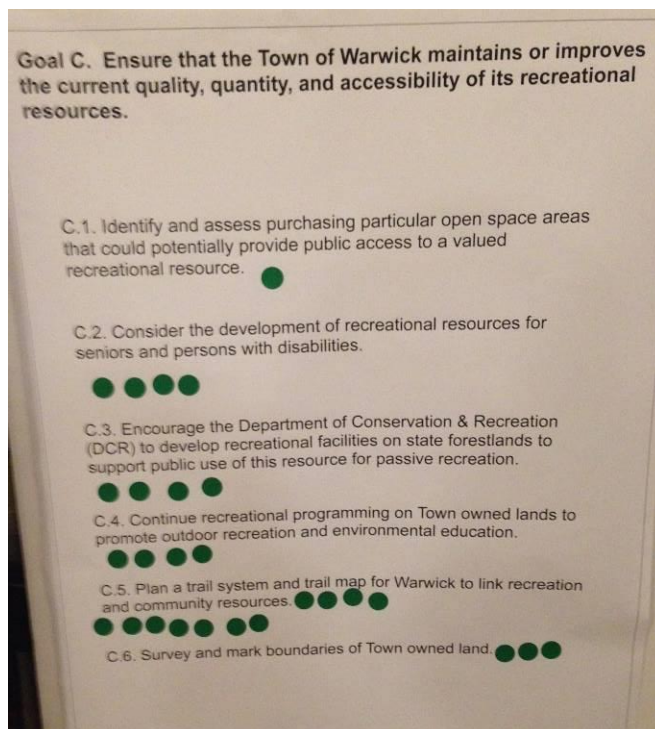
Public feedback was sought throughout the open space and recreation planning process. The text and maps included in the Plan reflect these enhancements. A more direct request for feedback on the maps and Seven Year Action Plan was made at the Public Forum held at the Warwick Town Hall on January 28, 2020. Approximately 30 people attended the forum. Participants were encouraged to review the draft maps and action objectives, and to add actions or comments directly onto the paper provided. A lively question and answer session followed the PowerPoint presentation. Comments from the forum participants were recorded by staff from the Franklin Regional Council of Governments. After the discussion, participants were asked to vote for their top 5 action objectives using “sticky dots.” The results of the sticky dot activity were used to prioritize the action items in the final Seven Year Action Plan.

Following the forum, draft copies of the maps and Seven Year Action Plan were made available for review by the public at the Warwick Free Library, Town Hall, and on the Warwick town website. Forum participants were also emailed electronic versions of the maps and the presentation following the forum. Comments received during the forum and the review period after the forum have been incorporated into the Plan and are summarized below.

Copies of the final version of the Warwick Open Space and Recreation Plan were sent to the following boards and organizations for review and comment:

- Massachusetts Division of Conservation Services (DCS)
- Warwick Select Board
- Warwick Planning Board
- Warwick Conservation Commission
- Warwick Recreation Committee
- Mount Grace Land Conservation Trust

Letters of comment are inserted into the



Forum participants used sticky dots to vote for their top five action objectives.

plan at the end of this section. The letters reflect the broad base of support the Warwick Open Space Committee and Town Forest Committee has earned over the past two years of hard and diligent work on the Open Space and Recreation Plan.

At the forum, much discussion revolved around recreational trails, which was reflected in the prioritization activity when participants selected planning a trail system and trail map in Warwick as one of the top action objectives. In addition, the following comments were received during the public comment period that followed the forum. Many of the comments were integrated into the plan. Questions were addressed and answered at a subsequent Open Space Committee meeting and are included below.

Comment: The discrepancy I saw was between the total square miles in town (32.6 sq. mi. on page 3-1 of the Dec. draft) and the total acreage (24,103 acres on page 3-3). One square mile = 640 acres. If the acreage figure is correct, then the square miles should be about 37.661.

Comment: In Section 5, Table 5-8 please add horseback riding to all lots on Maps 401, 405, 406, 408, and 409 in Warwick and in Northfield all lots abutting the town line, especially those around Notch Mtn, Round Mtn, Turnpike Road, Alexander Hill, and Northfield Mtn Project.

Comment: Page 3-1: I'm not sure that Warwick's land area is 32.6 square miles, as stated. Some references give it as 37.6 square miles. Perhaps this can be checked through an authoritative source. In any event, I don't believe that Warwick, as claimed in the text, is the largest town in the county. Colrain, at 43.4 square miles, and perhaps New Salem, are larger. There may be one or two other towns as well.

Comment: Page 3-1 and elsewhere: It is written that Warwick has very poor soils, which has supposedly limited its agricultural potential. There are other statements to this effect in the report, such as one on page 3-22 that refers to the town's supposed poor farming conditions. These statements strike me as being at odds with certain facts presented in the report and with my own observations. On page 4-11, it is noted that Warwick contains 7,575 acres of prime farmland soils, constituting 31% of the town's land area. That is a very large percentage of this town's land area, and I therefore do not believe it is accurate to state that the town has very poor soils and poor farming conditions. I can attest to the richness of Warwick's soil. I've been a gardener nearly all my life and have gardened in various places in this and other states. My residence is located atop prime farmland soil here in Warwick, and it is, by far, the very best soil for growing crops that I've ever worked with.

Comment: Page 3-13: It is noted that the town gave up land to form Orange in 1783. On page 3-15, it is written that the town voted to give up land to form Orange in 1781, and on page 3-33, it is written that the town transferred land to form Orange in 1781. It would be desirable to settle on a single date to avoid confusion.

Open Space Committee Response: *Per Charles Morse's history...At a town meeting in October 1781 it was voted to give the southeast section of Warwick to Orange (page 98). It appears that it didn't actually take place until 1783 (pages 19 & 25). Probably had to*

wait for the blessing of the state legislature. The town of Orange wasn't officially incorporated until 1810.

Comment: Page 3-27: Much of the second paragraph is unclear to me. I don't understand the relevance of owner-owned Chapter 61 lands or references to "backland acreage." I guess I'm just not clear on what the point of the paragraph is. Please clarify.

Comment: Page 3-27: A labor force figure of 501 is given. That is equal to 68% of the town's population, a percentage that is quite high for a town. I am not saying that it is incorrect, but I recommend that the figure be double-checked. Also, that figure is not consistent with Table 3-6. Granted, they are two different data sources, but the table says that there are 389 workers in Warwick. Applying the unemployment rate of 3% yields an estimated labor force of 401, fully a hundred fewer than the 501 given on page 3-27.

Comment: Page 3-30: the table shows that the number of establishments has increased, but the first sentence on the page says that there are "few businesses left in Warwick." Are *establishments* and *businesses* different? Please clarify, as the narrative doesn't seem to align with the table.

Comment: Page 3-31, second paragraph: What does *LTE* mean? Can you please define the term?

Question: Page 3-31: In the third paragraph, it is written that the town has been and continues to be actively engaged in identifying and supporting types of small businesses that would fit in well in Warwick. I'm not aware of such efforts. Is it possible to add a statement or two that describes more specifically what the town is doing in this regard?

Open Space Committee Response: *I am not aware of any efforts by the town to specifically identify potential small business activity in town and support development of such...Town residents do support several farms in town by buying their products. I would recommend that this sentence be deleted or changed to say that "the town would welcome and support small businesses that would fit in with the rural character of Warwick."*

Question: Page 3-33: There are references to Hastings Road. Should that read Hastings Height Road?

Open Space Committee Response: *I believe this section is referring to Hastings Heights Road.*

Comment: Page 3-35, second full paragraph: Gale Road, with the bridge being out, is not currently part of the east-west through road system linking Warwick to adjoining towns.

Open Space Committee Response: *This is true. Gale Road is not a thru road at this time...I think it's ok to say that usually Gale Rd is a thorough fare to Orange, but not*

currently. Living in the country this will happen from time to time where roads need work etc.

Comment: Page 3-40, last paragraph: The recession referenced in the narrative is not so recent anymore, and it's not clear that there is still pent-up demand for housing in the county. In any event, other data presented indicates that there was and is little or no pent-up demand in Warwick.

Comment: Page 4-5: The acreage figures do not add up to what is stated. The figures for Core Habitat and CNL add up to 3,025,000 acres, not the 2.1 million cited in the last paragraph.

Comment: Page 4-11: For the record, there is also a large parcel of prime agricultural soil along Flower Hill Road where I live. My casual observation from viewing the MassGIS Oliver map is that this is as large as some of the other parcels cited.

Comment: Page 4-14: The Connecticut River enters the Commonwealth solely in Northfield. Gill is further south and does not extend to the state border. - done

Comment: Page 4-20: Laurel Lake is said to be composed of 44 acres, with 15 of them in Warwick. On pages 4-54 and 4-58, the figures given are 51 and 10. Using Oliver's measuring tool, I get figures in between these two sets. In any event, to avoid confusion, it would be desirable to pick and present a single set of figures.

Comment: Page 4-39, bottom of page: "We have no sidewalks in this town,..." On page 3-35, however, it is noted that there is one sidewalk in town along the town common. I believe the latter is correct.

Comment: Page 4-42: Is there a reason why Table 4-4 doesn't include more of the plants that are listed in the earlier Table 4-2? Is it because those listed in the former are not necessarily found in BioMap2 areas?

Comment: Page 4-45: I'm not able to determine the relationship between Table 4-5 on this page and the earlier Table 4-4. Specifically, I'm wondering why two of the animals listed in Table 4-5 – the Jefferson Salamander and Water Shrew -- are not also listed in Table 4-4. Is it because those two don't appear to be present in Biomap2 areas?

Question: Page 4-46: In Section H, would it be possible to note which places are on private land and not open to the public? I'm under the impression, for instance, that Kidder Brook Falls and Lover's Retreat are on private land, and if so, it's not clear whether anyone can just go to those sites as they please.

Open Space Committee Response: *It is beyond the scope of this report to identify and list whether privately owned parcels are posted or not.*

Comment: Pages 4-56 and 4-57: It is not clear from the narrative detailing the additions to the town forest over the years whether the result was one contiguous parcel known as the town

forest, or whether there are unconnected parcels collectively referred to as the town forest. I thought the former was true, but the narrative suggests that the latter is true.

Question: Page 4-67: Why are only the top five environmental problems discussed? Could there be even just a sentence or two devoted to explaining the nature and perceived severity of the other five problems listed?

Open Space Committee Response: *This section [cannot] attempt to specifically describe the state of these complicated environmental issues in Warwick even with a few sentences, it's not the purpose of this report.*

Comment: Page 4-69 and elsewhere: The term dry hydrant is used in the report. Can that term be defined somewhere?

Comment: Page 4-71: Glossy Buckthorn is mentioned in the narrative as being problematic in town, but it does not appear in the table above it. Is it the same as either Common Buckthorn or European Buckthorn, both of which do appear in the table?

Comment: Page 4-72: Beech bark disease is listed among the forest problems that may be impacting the town's forests now. This is incorrect. Beech bark disease is very much in evidence throughout Warwick's forests. In fact, it is the only one of the insects/pathogens listed that is presently afflicting Warwick's forests, as far as I have seen.

Comment: Page 4-76: I am a birder, and based on my observations at my house in Warwick, I recommend adding the U designation in the "Winter" column for the Purple Finch.

Comment: Pages 4-80 and 4-81: For the record, I observed a Virginia Opossum in my garage in Warwick, and my neighbor observed a Bobcat in his yard on Flower Hill Road.

Comment: Page 5-2 and 5-4: The table on page 5-2 says that Warwick has 13,949.5 acres of permanently protected land, but the narrative on page 5-4 says there are 13,842 such acres.

Comment: Pages 5-22 and 5-23: The narrative on the first page says that the Black Gum Swamp is 8.8 acres, while the table on page 5-23 says 8.6 acres.

Question: Page 5-33: Can you please define the term "In-holdings" that appears on the last line?

Open Space Committee Response: *I interpret "in-holdings" in this context to mean unprotected, privately owned parcels that lie within large blocks of protected forested land.*

Question: Page 5-34: Is it correct to list scenic views under Recreation Resources rather than under Scenic Resources?

Open Space Committee Response: *I think that scenic views are important for passive recreational enjoyment and its fine to list them in both sections. To clarify, suggest adding: ...preserve outstanding views within “recreational areas”*

Question/Comment: Page 6-1: It is noted that the Open Space Survey was distributed to both residents and nonresidents. Is that correct? If so, then how is it possible to calculate that the Warwick household response rate was 15%? More important, shouldn't the survey results be separated by residents and non-residents? I don't think that non-residents should have an equal voice in Warwick's open space resource planning efforts.

FRCOG Response: *It's not possible to determine if all 53 respondents are residents. 50 people answered question C4, answering how long they have lived in Warwick. It seems likely that respondents are either residents or own land in town.*

Comment: Page 6-3: The last paragraph lumps the transfer station in with other locations and calls them popular recreation sites. I understand that residents, myself included, often converse with other residents at the transfer station, but I think it's inaccurate to refer to it as a recreation site. Perhaps something like, “popular recreation and other meeting sites” could be substituted into that sentence.

TOWN OF WARWICK PLANNING BOARD

12 Athol Road, Warwick, MA 01378

Chair Home Phone: 978-544-6410

Ms. Melissa Cryan
Massachusetts Division of Conservation Services
100 Cambridge Street, 9th Floor
Boston, MA 02114

RE: Warwick 2020-2027 Open Space and Recreation Plan

Dear Ms. Cryan,

The Warwick Planning Board has reviewed the Draft Warwick Open Space and Recreation Plan and made some minor comments. Overall, we strongly support the Plan, its recommendations and its time frames. We encourage you to approve it.

You may be pleased to hear that three members of the 5 member Planning Board, among others, have been asked and accepted an invitation to work on various committees formed to implement areas identified in the plan as needing action. This immediate action was based on the agreement that the recommended actions were worthy of implementing as soon as possible. In my experience it is nice when a plan is developed and moves into the implementation phase and does not go onto a shelf somewhere. Obviously, this would not happen unless it was a strongly supported plan, and it is why the Planning Board strongly recommends your approval of it.

Yours truly,

Edwin B. Cady, Jr.
Chair



Town Of Warwick

Town of Warwick
12 Athol Road
Warwick, MA
01378

Phone: 978-544-6315
FAX: 978-544-6480
communications@town.warwick.ma.us
www.town.warwick.ma.us

Selectboard:
Lawrence Pruyne, chair
Todd Dexter
Brian Snell

November 23, 2020

Melissa Cryan
Massachusetts Division of Conservation Services
100 Cambridge Street, 9th Floor
Boston, MA 02114

RE: Warwick 2020-2027 Open Space and Recreation Plan

Dear Ms. Cryan,

The Warwick Selectboard is pleased to endorse Warwick's 2020 Open Space and Recreation Plan update.

The plan represents months of effort by the members of the Warwick Open Space Committee, Town Forest Committee, as well as town residents and officials. This plan builds off the open space and recreation plan and accomplishments of the past 10 years and provides a clear strategy for continuing to steward and conserve Warwick's abundant natural resources.

We hope that you will find that it meets the criteria for approval by the Commonwealth of Massachusetts.

Sincerely,

TOWN OF WARWICK

x 
Lawrence Pruyne
Selectboard Chair

Committed to educating Warwick students in Warwick since 1738



May 19, 2020

Melissa Cryan
Massachusetts Division of Conservation Services
100 Cambridge Street, 9th Floor
Boston, MA 02114

RE: Warwick 2020-2027 Open Space and Recreation Plan

Dear Ms. Cryan,

The Franklin Regional Council of Governments (FRCOG) is pleased to endorse the work of the Warwick Open Space Committee and Warwick Town Forest Committee in completing an update to the Warwick Open Space and Recreation Plan (OSRP). We enthusiastically support their submission of the 2020 Warwick OSRP to the Massachusetts Division of Conservation Services for review.

The plan was developed by members of the Warwick Open Space Committee and Town Forest Committee, with technical assistance provided by the FRCOG Planning Department. The plan represents almost two years of work to build consensus on the most important natural, recreational, and scenic resources and the needs of Town residents. Data analysis and input from Committee members, Town officials, and residents were used to update the text, maps, and goals and action items from the 2010 plan. We commend the members of the Open Space Committee and Town Forest Committee for their dedication to this project.

The 2020 Warwick OSRP will provide Town officials and volunteers with an invaluable resource to help inform and prioritize open space protection and recreation improvements. This plan update, once approved by the State, will allow Warwick to apply for funding to implement actions in the plan. The plan will also enable Warwick to continue to collaborate with neighboring towns, local land trusts, and regional organizations to work towards meeting the regions' open space and recreation goals. We congratulate the Town of Warwick for completing this project!

Sincerely,

A handwritten signature in blue ink that reads "Kimberly Noake MacPhee".

Kimberly Noake MacPhee, P.G., CFM
Land Use and Natural Resources Program Manager

12 Olive Street, Suite 2, Greenfield, MA 01301-3351 • 413-774-3167 • www.frcog.org





Charles D. Baker
GOVERNOR

Karyn E. Polito
LIEUTENANT GOVERNOR

Kathleen A. Theoharides
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

November 10, 2020

Alyssa Larose
Franklin Regional Council of Governments
12 Olive Street, Suite 2
Greenfield, MA 01301

Re: Open Space and Recreation Plan

Dear Ms. Larose:

Thank you for submitting the draft Open Space and Recreation Plan for Warwick to this office for review and compliance with the current Open Space and Recreation Plan Requirements. This plan was particularly thorough and has been conditionally approved through November 2027. Conditional approval will allow the town to participate in DCS grant rounds through November 2027, and a grant award may be offered to the town. However, no final grant payments will be made until the plan is completed.

Once the following items are addressed, your plan will receive final approval:

1. Section 5 – please note that parkland is also protected under Article 97. The table that lists town-owned conservation land must be expanded to include columns on recreation potential, zoning, and degree of protection. Please delete the quotation marks that are often placed around the Self-Help grant. A list of Conservation Restrictions in the town should be listed in this section as well.
2. Letters of Review – a letter from the chief municipal officer is needed.
3. Maps – the Water Resources map should identify the watersheds.
4. ADA – this section does not include all three required sections.

Congratulations on undertaking such an important task! Please contact me melissa.cryan@mass.gov if you have any questions or concerns, and I look forward to reviewing your final plan.

Sincerely,

Melissa Cryan

Melissa Cryan
Grant Programs Supervisor



Charles D. Baker
GOVERNOR

Karyn E. Polito
LIEUTENANT GOVERNOR

Kathleen A. Theoharides
SECRETARY

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Tel: (617) 626-1000
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January 26, 2021

Alyssa Larose
Franklin Regional Council of Governments
12 Olive Street, Suite 2
Greenfield, MA 01301

Re: Open Space and Recreation Plan

Dear Ms. Larose:

Thank you for submitting the Open Space and Recreation Plan for Warwick to this office for review and compliance with the current Open Space and Recreation Plan Requirements. I'm pleased to write that the plan has received final approval and the town is eligible to apply for DCS grants through November 2027. Please contact me melissa.cryan@mass.gov if you have any questions or concerns.

Sincerely,

Melissa Cryan

Melissa Cryan
Grant Programs Supervisor

SECTION 11

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APPENDIX A

Warwick Open Space Committee Meetings

Public Forum Publicity & Sign-In

Warwick Open Space Committee

p.1 of 2

August 13, 2018

Present: George Day, Chair; Chris Duesterberg - Co-Chair;
Mary Williamson, Secretary; Clare Green.
Alyssa Larose, Franklin Regional Council of Governments

Meeting called to order at 4:07 pm.

Minutes of the June 18, 2018 Meeting

On motion by Mary, seconded by Chris, the minutes were accepted unanimously as circulated.

Re Updating The Warwick Open Space Recreation Plan
Re Section 9

Since the 6/18/18 meeting, two WOSC members sent in suggestions which Alyssa has incorporated into this section. Alyssa handed out copies at the meeting.

The purpose of ~~working~~ reviewing Section 9 now is to remind us of past open space goals and to be reminded of what has been accomplished since then.

We discussed whether the Town still aspires to have a trail committee and a trail map.

Discussed having a protocol for responding to the Town's Right of First Refusal for Chapter 61.

Right-to-Farm By Law - has been accomplished.
(The Planning Board functions as both the Planning Board and simultaneously as the Agricultural Committee.)

Re 10 Most Important Action Steps

It makes sense to wait to prioritize and review these later, after the Public Forum and we can structure the survey to take some prior action steps re community into consideration.

Warwick Open Space Committee

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August 13, 2018

Review of Section 3 - Community Setting

Alyssa will bring the map to the next meeting. It includes History of Warwick and Regional Setting. Alyssa has not made many changes to the History section. Alyssa reviewed the changes she made.

Any Committee member can send in comments to her after the meeting.

This section is an overview section, so we will go into more detail in other sections, such as for example, re Town Forest.

We reviewed Section 3 page by page. Suggested having a large-scale ground-mounted solar installation By-Law.

Completed the ~~the~~ group review of Section 3.

By next meeting, WOSC should complete the review of Section 3 and send any comments to Alyssa.

By next meeting Alyssa will have incorporated any additional changes to Section 3 to show us.

Next Meeting Date: Suggested Monday, Sept. 10 at 4 pm.

Adjournment: On motion by Chris, seconded by Clare, the meeting was adjourned at 5:55 pm.

Respectfully submitted,

Mary Williamson
Secretary

Warwick Open Space Committee

p.1 of 3

September 11, 2018

Present: George Day, ^{Acting} Co-Chair; Chris Duerning, Co-Chair; Mary Williamson, Secretary; Mark D. Maynard, Alan Berman, Clare Green, Alyssa Larose, Franklin Regional Council of Governments

Meeting called to order at 4:10 pm

Minutes of the August 13, 2018 Meeting

On motion by Clare, seconded by Chris the minutes were approved as circulated. (Alan and Mark abstained.)

Ceremony To Thank Sen. Rosenberg Re Town Forest Land Acquisition

September 29 at 2 pm is the time set for the ceremony to thank Senator Stan Rosenberg for his help in raising the funds that enabled Warwick to purchase the 88-acre Victoria Shaw lot in November 2017.

Discussed the best location for holding the event and the logistics involved. If it is too difficult to transport the group to the parcel due to access issues, we could hold it in the scenic town center.

Discussion of Shaw Property Access

Discussed all four possible access routes listed on the agenda.

The access road through the Town Forest is too wet to be usable now.

DER may not be willing to allow us access through Page Rd. because that section of State Forest is in the "Reserve Area" in which regulations specify that one cannot upgrade roads nor make new trails.

George will follow up on doing research re the possibility of a land swap with DER. He will begin by speaking with Rod Whipple.

There is a current access trail on DER land south of Helen Hills, but it also crosses very wet areas and it enters the Shaw lot in a steep place. It is over 1 mile from Wendell Rd. to the west end of the Shaw lot and it would be expensive to upgrade the road through the Town Forest for big trucks.

Warwick Open Space Committee

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September 11, 2018

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Section 3 Review

Open Space and Recreation Plan Update Project

Alyssa handed out copies of the latest draft of Section 3, + Renewed it. Broadband: Alyssa received comments from David Young and Tom Nytt, which she incorporated, (p. 3-24)

Building Inspector: Information not received until today so not in text yet. p.3 Alyssa added a paragraph about the Tally Valley Private Forest Lands Initiative.

Mt. Grace: adjusted its height

p.3-21 corrected spelling of Hobbes

Warwick Community School: updated employment figures

p.3-37 Section to include building permit information.

2009-2017: 8 permits for new homes in town

p.3-39 added sentence re hiking trails in town

Once we get further along, we can always revisit Section 3, but for now we will consider it sufficiently updated.

Map

Regional Context Map

Alyssa showed a draft; it included the transmission line.

Wose suggested adding New England National Scenic Trail Route.

Suggested adding information re watershed boundary.

Consider showing large solar farms in adjacent towns

" including hill names and elevations

Section 4 Review

Section Four

Alyssa handed out a draft of just the first part of Section 4, which is a very long section.

Alyssa added quite a bit of information and updated topography, geology, soils, landscape character, and water resources.

FRCG now tries to add information to Open Space Plans re how climate change is affecting natural resources.

September 11, 2018

Section 4
cont.

Section 4 A-1: includes temperature data and projections to mid-century and out to the end of the century. This is data projected for the Millers River Watershed.

Fig. 4-2 Shows precipitation data.

These changes will impact local species.

and there may be more flooding which affects infrastructure.

Section includes suggestions re managing species for resilience.

Section B:1 Re Biomaps 2 = re biodiversity

maps Core Habitat, etc.

B-2 Nature Conservancy resiliency map and wildlife corridors

Topography, Geology and Soils - not much has changed in this section.

Warwick has ~7500 acres of prime soils = 31% of land;

but much of it is now reforested.

Landscape Character (p 4-12) added more info.

8000 acres of Core Habitat = a lot in Town

this land supports Biodiversity

Water Resources: added re cold water fisheries

(Hemlock decline may affect these)

Mostly left as was in 2010 Plan, but just updated.

Reviewed the brooks and bodies of water one by one at the meeting.

No public water supplies in Warwick. Reviewed Flood prone areas.

Flood plain maps are several decades old, so added 2014 data.

Including mapping of "active river area" - can be larger than the 100 year flood area. = Area not good for building.

Wetlands: updated this section

Before Next Meeting: Committee should Review this part of Sect. 4.

Also will work on more of Section 4.

Next Meeting: Tuesday, October 16 at 4:00pm at Town Hall

Adjournment: On motion by Mark, seconded by Clare, at 6:07 p.m.

Respectfully submitted, Mary Williamson, Secretary

**Warwick Open Space Committee
Meeting Minutes
October 23, 2018**

- **Meeting called to order at 4:10 pm**
- **Attendees:** Alyssa Larose (FRCOG), Clare Green, George Day, Keith Ross, Chris Duerring
- **Outline of the September meeting minutes read.** George Day motioned to accept the minutes as read, Clare Green second, all in favor. Keith abstained.
- **Shaw Property celebration and site visit:** Good turnout from town residents. Stan Rosenberg came for the ceremony at the town hall but was unable to make the site visit. The committee thanked him for obtaining the funding that enabled Warwick to purchase the property as well as his support for the town during his career. He was very appreciative. Thanks to George's efforts, Judy Shaw gave permission to access the newly protected parcel through her property just for this site visit. George sent her a thank you note. Eleven people came for the site visit and enjoyed a walk through the property. All in attendance agreed it was a very successful event.
- **Open Space Plan update project:** Alyssa handed out 2nd draft of Section 4. She was unable to bring the maps for section 4 but will bring them next time.

Last meeting we reviewed first part of section 4. Alyssa said that the committee can still comment on this section as it is still in track changes.

Continued discussion of first part of section 4. A few additional changes made as noted on 2nd draft handout dated 10/23/2018.

Committee reviewed and discussed several subsections in section 4 including: vegetation, forests, agriculture, wetlands, rare species, fish and wildlife, etc.

Alyssa will email updated section 4 to the committee for our review before next meeting. She encouraged committee members to send her comments on this material as well as on any other part of section 4.

FRCOG budget for OSP update is running out – just enough for one more meeting this year. FRCOG and town will work on securing funding for continuing plan update in 2019.

- **Next meeting:** November 27, at 4:00 pm, Warwick Town Hall
At this meeting we will work on reviewing the maps and remaining subsections for section 4 (scenic resources and unique environments and environmental challenges).
- **Meeting adjourned 5:45 pm:** Chris moved to adjourn meeting, Clare second, all in favor.

Minutes respectfully submitted by Chris Duerring

Open Space Committee

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January 15, 2019

Presents: George Day, Acting Chair; Chris Duerrring, Co Chair;
Mary Williamson, Secretary; Keith Ross, Clare Green;
David Young, Town Coordinator.

Meeting Called To Order at 4:08pm

Minutes of This Meeting on November 27, 2018

Chris read the minutes as Clerk for that meeting.

On motion by Keith, seconded by Clare, the minutes were accepted unanimously as read. (Mary abstained as she was absent.)

FRCOG Technical Assistance Grant (Applied for on 1/7/19)

David Young has already submitted the town's application for assistance. The Town ranked two projects as #1: Help with an abandoned property (Clinknight at Moore's Pond) and Completing the update of the Town's OSRP Plan. When FRCOG subsequently called David with a question, he specified that OSRP was ^{most important} ~~more~~.

Open Space Plan Map - Showing Historical and Scenic Sites

George and Clare have reviewed it, David Shepley now has it; Keith will take it next, and then pass it on to Chris.

Re Lincoln Land - Possible Gravel Pit

We have heard nothing from the Lincoln family since the Town wrote ^{them} a letter stating that they had not yet submitted the correct documents to change the status from Chapter 61 to commercial use land.

Pollard Land on Wendell Road

This parcel abuts Town Forest, but a stream separates the lots. There is probably room for only one house lot because the lot is narrow. The family still wants to sell the land, but they are still asking a high price first. Mount Grace Land Trust, which the family approached recently, asked if the Town of Warwick would be interested in purchasing the parcel once our Open Space Plan was updated so that we could apply for a "LAND Grant." Because the land is next to

Warwick Open Space Committee

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January 15, 2019

Town Forest, it would be of some interest; but the Open Space Committee is also interested in pursuing the Lincoln land near the school (where the gravel pit was proposed) and the Unitarian Church-owned land on Hastings Pond Rd. that is the site for "Wabreck" Rock.

Since the Church is in the process of selling the Parsonage, the WOSC wondered if they might not also be interested in selling their Hastings Pond Rd. land to the Town.

Ralph Jay

Ralph Jay, who conserved over 90 acres of land on both sides of Winchester Rd. through the Forest Legacy Program, passed away on Thursday, January 10.

Conflict of Interest Law For Municipal Employees

Copies of the information were distributed to all WOSC members who were present at the meeting.

Next Meeting Date

We will wait to make sure we have received the Technical Assistance grant before we schedule the next meeting.

Adjournment

On motion by Chris, seconded by Clare, the meeting was adjourned at 4:45 pm.

Respectfully submitted
Mary S. Williamson
Secretary

Warwick Open Space Committee

April 9, 2019

Present: George Day, Acting Chair; Chris Duerrong, ~~Co-Chair~~
Mary Williamson, Secretary; Keith Ross, Mark Maynard
Alan Berman
Alyssa Larose, FRCOG

Meeting called to order at 2:08 pm

Minutes of March 12, 2019 Meeting

On motion by Chris, seconded by Keith, the minutes were accepted unanimously as circulated. (Alan Berman abstained because he was absent on 3/12/19.)

Review of Survey

Working from the 2009 Survey, we discussed suggestions for changes and updates for ^{the} 2019 Survey.

Deadline for completing The survey: May 31, 2019

Publication Date: In the May Town Newsletter (approximately May)

Publishing The Survey: FRCOG will print hard copies for us if we need them.

Mary will call Beth Gilman on 4/10/19 to discuss whether she wants us to supply her with preprinted hard copy or digital text.

Tabulation of Completed Surveys: FRCOG staff will help with that.

Review of Chapter 4

Alyssa presented the changes she had made to incorporate updates. George will supply a map to Alyssa which shows the historic cellar holes which will be included as a separate map.

Review of Revised Survey Text

Alyssa will e-mail Committee members a copy of the revised Survey for final approval to meet the April 20 Newsletter deadline.

Warwick Open Space Committee

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April 9, 2019

Chapter 5

Keith Ross and Beth Gilman will update the map that shows the conservation land, before our next meeting.

We will work on Chapter 5 at the next meeting.

Unitarian Church Woodlot and Church Building

The 3 remaining Church Board members are planning for distributing the Church property, which includes a 30-acre woodlot on Hastings Pond Rd., donated by the Wheeler family, which is the site of Wakeek Rock. (They have been paying full taxes on the land.)

The Town should consider whether it is interested in acquiring the woodlot and church building. (The Parsonage is being sold to a private buyer.)

Next Meeting Date: Tuesday, May 14 at 2:00 p.m.

Adjournment:

On motion by Mark, seconded by Chris, the meeting was adjourned at 4:05 p.m.

Respectfully Submitted,
Mary S. Williamson
Secretary

Contact Information

Alyssa Larose
(413) 774-3167
ext. 127

Warwick Open Space Committee

May 14, 2019

Present: George Day, Acting ~~Chair~~ Chair; Chris Duerring, Co-Chair,
Mary Williamson, Secretary; Mark Maynard,
Clare Green.
Alyssa LaRose, Franklin Regional Council of Governments

Meeting called to order at 2:10 pm.

Minutes of The April 9, 2019 Meeting

On motion by Chris, seconded by Mark, the minutes were accepted unanimously as distributed.

Survey Results (Survey was included in May Town Newsletter)

To date, 15 surveys have been received.

There were extra copies ~~was~~ available at Town Meeting.

At Town Meeting the Town Coordinator encouraged residents to fill them out. FRCOG will help us tabulate the surveys.

We will encourage residents to fill it out when they attend Town Elections on May 20 at the Town Hall.

Scenic Resources Map

Alyssa brought the final hard copy of this map (after sending committee members an e-mail draft).

George will keep this map.

Open Space Map

The Warwick Assessor's Office helped Alyssa update the Chapter 61 parcels (all 3 types: Agricultural, Forest, and Open Space).

The State requires the map to distinguish between the different types of ownership of the open space. Also the map distinguishes between permanently and temporarily protected open space.

Warwick Open Space Committee

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May 14, 2019

First Draft of Chapter 3

The Committee reviewed Alyssa's revised draft of the Chapter.

Next Meeting: Tuesday, June 25, 2019 at 2:00 p.m.

Adjournment:

On motion by Mary, seconded by Chris, the meeting was adjourned at 8:20 pm.

Respectfully Submitted,
Mary S. Williamson
Secretary

Warwick Open Space Committee

June 25, 2019

Presents: George Day, Acting Chair; Mary Williamson, Secretary;
Clare Green
Alyssa LaRose, Franklin Regional Council of Governments staff

Meeting called to order at 2:08 pm

Minutes of the May 14, 2019 Meeting

On motion by George, seconded by Mary, The minutes were accepted unanimously as circulated.

Update Re Surveys

53 surveys were returned.

This is 78% of the Warwick population.
(158 of the households)

In small rural towns it is hard to get a statistically significant number of responses.

(The last Open Space Plan Update Project generated 54 surveys.)

Summary of Survey Results

Alyssa reviewed the data which she had compiled.

She had created a chart for the responses to every question. The 78 response rate is acceptable because the survey results are only just one of several sources of input for the Open Space Plan, including the Public Forum and the Open Space Committee Plan Update meetings.

Alyssa did an excellent job in compiling the data in color-coded charts that were very informative.

These charts will be incorporated into the Appendix of the updated Open Space Plan.

Warwick Open Space Committee

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June 25, 2019

Section 5

We reviewed the updates and changes, incorporated to date. Committee members are asked to review the "E. 4 Open Space Criteria" portion of Sect. 5.

Next Meeting

We will work on Chapter 6, which is brief.

And also Chapter 7 - "Analysis of Needs" - which will utilize survey results.

Maps

We will continue to work on the maps.

Prior Chapters

Alyssa will look back at prior Chapters, and incorporate any survey results that are appropriate.

Next Meeting Date

Tuesday, July 23 at 4:00 pm (subject to absent Committee members availability.)

Adjournment

On motion by Mary, seconded by George, The meeting was adjourned at 3:47 p.m.

Respectfully Submitted
Mary Williamson
Secretary

Open Space Committee Meeting
September 10, 2019
Warwick Town Hall
Draft Minutes

Attendees: George Day, Chris Duerring, Mark Maynard, Alyssa Larose (FRCOG), Clare Green. David Young arrived late in the meeting.

Meeting called to order at 4:04 PM

Mark M. moved to approve minutes of last meeting. Chris D. seconded.

Open Space and Recreation Plan:

- Alyssa L. distributed revised copies of the following drafts: recreational map, Section 5 (4th draft), Section 7 (2nd draft), Section 9 (1st draft).
- Committee reviewed and discussed changes made on the map and Sections 5 and 7 drafts since last meeting and recommended several more revisions.
- Alyssa will follow up on these new revisions as well as address remaining questions about Article 97.
- Committee started reviewing Goal A of Section 9 (Table of Recommended Actions).
- Alyssa L. asked the Committee to look over the entire first draft of Section 9 for next meeting. She will send the complete table electronically.
- Next meeting the Committee hopes to focus on reviewing the remaining goals of the Action Plan. Section 9 is the last section of the plan to complete.

Wagon Wheel Campground: David Young informed the Committee that the Wagon Wheel Campground may be coming up for sale and asked the Committee to consider whether the Town should pursue purchasing it, if it became available. No other specific information about the property or seller's intent was available at the meeting.

Next meeting October 29, 2019 at 2:00 PM (tentative date)

Motion to adjourn by George D., seconded by Clare G. Meeting adjourned at 5:37 PM.

December 10, 2019

Present: George Day, Chair; Chris Duesing, Co-Chair; Mary Williamson,
Secretary; Alan Berman, Clare Green
Alyssa LaRose, FRCOG

Meeting called to order at 2:10 pm.

Minutes of The October 29, 2019 meeting

On motion by Chris; seconded by Mary, the minutes were accepted unanimously as distributed at the meeting. (Alan abstained as he was absent.)

Review of The Open Space Plan Draft

Section 1: only date changes

Section 2: Some parts removed as more relevant to The 2010 Plan.

Updated the process section.

Once Public Forum has happened, will add info re that.

The list of accomplishments has been moved to Chapter 9, but actions and status of objectives will still be included here.

Section 3: reviewed

Section 4: Needs more work, so Alyssa will send out information for the WOSC to review. Ryan Cleary still needs to update the accompanying map which shows permanently protected open space.

Reviewed recreational and historic values of some sites.

Section 5: This section is in good shape because we reviewed it recently.

Section 6: Description of the Plan update process was described.
Reviewed the goals section.

Section 7: Is settled

Section 8: Derived from other sections.

Section 9: Reviewed list of accomplishments.

The Table changes includes changes added at a prior meeting.

December 10, 2019

Landscape Partnership Grant

Alan Berman attended an information session held at Fish and Wildlife Headquarters in Westfield on December 5 which provided information about applying for this grant.

It requires 500 acres of new conservation land to be included as a minimum, and it provides 50% grant funding.

Alan thinks we might be able to apply for this grant for the January 2021 deadline.

One of the goals of such a project would be to acquire additional Town Forest land that could provide timber harvest income to the Town.

Alan believes that the Grant Coordinators would look particularly favorably on a grant application submitted by a Municipality vs. a Land Trust or state Agency.

Preparing For The Public Forum

Alyssa will prepare a draft flyer on our behalf for our review. We will put information in the January Newsletter about the Forum.

George will prepare the information for the Newsletter.

Alyssa will incorporate the changes discussed today into the Plan.

Public Forum Dates 1/28/20 at 7pm at The Town Hall.

Alyssa will bring large maps and charts for the Forum.

Alyssa will prepare a written summary report - she is willing to make the presentation, but it is often more effective to have a Town resident make it.

Once we receive Alyssa's outline, we will discuss who on the Committee will present the Plan summary and highlights to The public. We will ask the public to express their priorities by applying stickers to a large map of The Town.

Adjournment: On motion by Clare, seconded by Chris, the meeting was adjourned at 4:10 pm.

Respectfully submitted
Mary S. Williamson

Public forum flyer

WARWICK 2020 OPEN SPACE AND RECREATION PLAN UPDATE

PUBLIC FORUM

Tuesday, January 28, 2020

7:00 p.m.

Warwick Town Hall

**The Warwick Open Space Committee invites you to a presentation of the
DRAFT 2020 Warwick Open Space and Recreation Plan. Please help us prioritize
Town open space and recreation objectives for the next seven years!**

Light refreshments will be provided

Contact Alyssa Larose, Franklin Regional Council of Governments, at
alarose@frcog.org or 413-774-3167 x127 for more information

Public forum handout

Warwick Open Space and Recreation Plan

2020 Update Overview

The Warwick Open Space and Recreation Plan provides an inventory of cultural, natural, and recreational resources in Warwick; identifies open space and recreation needs in town; establishes goals, objectives, and actions to meet these needs; and enables the town to apply for state grants for land conservation and recreation facility improvements.

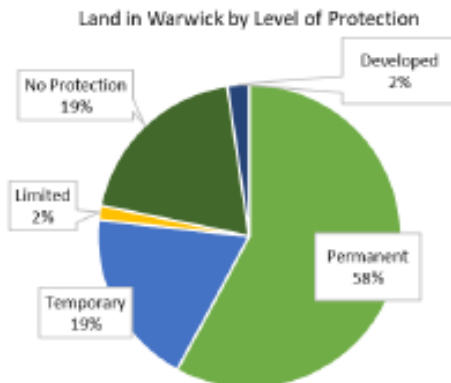
The last plan was completed in 2010. The current update began in June 2018 by the Warwick Open Space Committee, with assistance from the Franklin Regional Council of Governments. A public survey was completed in May 2019, with 53 responses.

Major Accomplishments since the 2010 Plan:

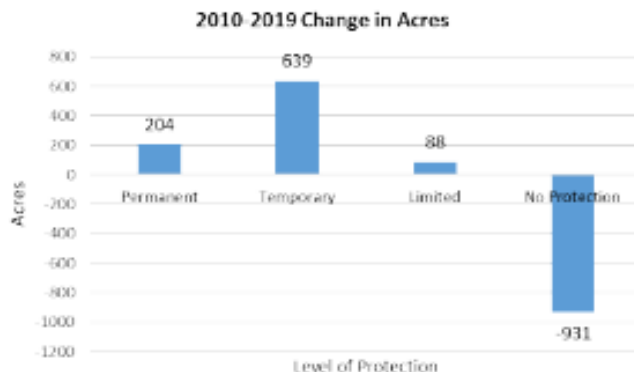
- Acquisition of Moores Pond beach - 2010
- Passage of Right to Farm bylaw – 2010
- Warwick Farm Inventory completed by MGLCT – 2016
- Acquisition of Victoria Shaw property, adding 88 acres to the Warwick Town Forest – 2017
- At least 30 vernal pools certified by the Conservation Commission
- Expanded options for recreation classes and events offered through the Recreation Committee & Council on Aging
- Warwick Town Forest handbook compiled by the Open Space Committee – 2017



Key Findings of the 2020 Update:



- Roughly 58% (13,950 acres) of open space in Warwick is permanently protected from development
- Only 41% of Warwick's active farm fields are permanently protected from development (2016 Farmland Inventory)
- Warwick has many locally and regionally significant natural resources – BioMap2 Core Habitat, Coldwater Fish Resources, contiguous forestland
- Warwick residents support passive, low-impact recreation activities such as hiking, swimming, fishing, and road-biking
- Residents have a strong sense of community and would like more opportunities and places to convene and recreate together



Permanent = Owned by State or non-profit conservation organization; owned by Town and under control of the Conservation Commission; or privately-owned with a CR or APR

Temporary = Private land enrolled in one of the Chapter 61 current use programs

Limited = Town-owned land not under the control of the Conservation Commission

Warwick Open Space and Recreation Plan

Public Forum

Tuesday, January 28, 2020 7:00 p.m.

Name	Affiliation	Contact	✓ If you want a copy of the draft plan emailed to you
Chris Duerring	Open Space Committee	cduerring@hotmail.com	
MARK MAYNARD	OPEN SPACE COMM.	ZAPPAFAN1992@GMAIL.COM	
Alyssa Larose	FRCOG	alarose@frcog.org	
Mary Williamson	Open Space/Com Com	(978) 544-7133	
JEANNE ABELS	RESIDENT		
JIM ABELS	RESIDENT	978 544 3059	
John Williamson	Planning Bd.	975-544-7133	
Zeak Deluce	Press - The Recorder	413-772-0261 ext 264 ^{zdeluce@recorder.com}	
Karl Quenkel	Resident	781 820 -1379 ^{Karl Q. Quenkel}	✓
Nancy Lee Harnden	RESIDENT (MAP LIST!)	781-820-1379 nlharnden@comcast.net	
Janice Kurkoski	Warwick Bldgs & Energy Chair	978-544-3419	
Mary Neville Wall	BSTRA	978-544-0955 exodus.acres@wildblue.net	
Seth Wright	Resident	544-3138 sethwd22@hotmail.com	✓
Claudia Lewis	resident	all-our-daydream@gmail.com	✓
Michael Italy	resident	maigtr56@gmail.com	

OLYDE PERKINS SR.	RESIDENT	978 544 3879	
BOB PAQUET	RESIDENT	544 3150	
Clare Green			
Kaila Woodson	Resident	Kailadwoodson@gmail.com 828-747-0377	✓
Dan Dibble	Resident	metcalfecc@gmail.com	
Alan Berman	Town Forest Committee	978-413-7534	
Tom Wyatt	Resident	413-768-8641	
NATHAN SWARTZ	RESIDENT	979-544-3201	
A. GEORGE DAY, JR	OPC	978-544-6780	
Allison Wright	Resident	978-544-3138	
Claudia Lewis	Resident		

WARWICK

Preservation of character, natural land among planning goals

By ZACK DeLUCA
Staff Writer

WARWICK — A survey of residents helped to inform the 2020 Open Space and Recreation Plan, which is focusing on increasing support for recreation and integrating conservation and balanced management efforts.

The plan, which is updated every 10 years, was outlined during an Open Space Committee public forum on Tuesday evening. Warwick maps and a PowerPoint presentation were presented by Franklin Regional Council of Governments' Senior Planner Alyssa Larose, who was assigned to collaborate with the local committee through FRCOG's District Local Technical Assistance work.

Larose and the committee spent the last two years working on the plan, which includes ranking the priority of town objectives and needs. Fifty-three residents weighed in on what they'd like to see happen in town through a survey conducted in May.

"Warwick has a strong sense of community," Larose said while explaining the sur-

vey results. "People expressed a desire for places where they could come together for recreational activities."

The plan's "identified needs" for the future include: integrating climate resiliency into conservation and balanced management efforts; increasing support for low-impact recreation activities like hiking, fishing, swimming or biking; and developing a town-wide trail map. More than 40 percent of the residents surveyed suggested Warwick try to obtain trail rights through private lands, and 55 percent support publicly-funded trail maintenance.

The action plan going forward, Larose said, will also aim to maintain agricultural, historic and cultural resources, improve the quality of air and water and protect native wildlife. Another goal is to ensure the economic stability of the community by developing supportive infrastructure and encouraging economic activity compatible with the rural character of Warwick.

Larose also cited updated population statistics and assessed the town's progress since the last Open Space and

Recreation Plan was finished in 2010.

The total population based on a 2016 estimate is 742 residents, with the population declining by 5 percent from 2010 to 2016. In 2016, an estimated 99 percent of Warwick's labor force was employed outside of the town, with an average commute of 37 minutes. Nearly half of the population is between 45 and 64.

"Warwick has the highest median age in the county at 54.9 years of age," Larose noted.

Despite its aging population, Warwick has proven to have a proactive community, and stayed on track with many of its goals set in 2010, Larose said. The town passed the Right to Farm bylaw in 2010, acquired the Victoria Shaw property to add 88 acres to town forest land in 2017 and had more than 30 vernal pools certified by the Conservation Commission. Additionally, the Open Space Committee compiled a Warwick Town Forest handbook in 2017.

"Approximately 36 percent of the town is considered core habitat," Larose said.

Core habitat is land identi-

fied as necessary to maintain biodiversity, and Warwick has many significant natural resources. While she said there is less of a threat from development, she noted that natural resources still face threats from pollution, invasive plants and animals or disease.

Open Space Committee Co-Chair George Day said there is also potential value to town-owned forest land. Warwick receives the income from timber harvesting, leading to decent revenue on a few occasions. He noted the old Fire Station was even built using timber harvested in town.

In addition to potential revenue, the forested land preserves the town's rural character and trails. In the survey, more than 40 participants said these characteristics were a "very important" factor in their decision to live in Warwick.

According to Day, the town has acquired \$239,133 worth of forest land since 1925. This includes the 87-acre Town Forest Reservation in 1925, the 80-acre Wilbur lot in 1945 and the 53-acre Allen lot in 1947 —

SEE WARWICK B2

Warwick

FROM B1

where the Highway Department is now located, among other forested parcels.

Day said \$224,538 of the funding for land acquisitions

came from grants and private donations, as opposed to the \$14,595 of Warwick funds appropriated through town meetings.

Other notable acquisitions of town land include the Wendell Road gravel pit in 1935 and Moore's Pond Beach in 2010. Moore's Pond Beach was

purchased for \$19,000 — \$13,000 of which came through town meeting allocations and \$6,000 from donations.

Larose said she is now coordinating with the Warwick Open Space Committee to set a due date for public comments, and will email the forum participants with infor-

mation on submitting comments. The Open Space and Recreation plan, maps, and survey results will also be posted to the Warwick website shortly.

Zack DeLuca can be reached at zdeluca@recorder.com or 413-772-0261, ext. 264.

APPENDIX B

2019 Open Space and Recreation Survey and Results

2019

Warwick Open Space and Recreation Plan

Why should I take the time to complete this survey?

Your answers will form the basis for an Open Space and Recreation Plan for Warwick and help the Town as it continues to develop land-use policies and priorities for town government's use in planning for future growth and protecting our natural, scenic and historic resources—all of the things that make Warwick a special place to live. The plan will help Warwick qualify for federal and state funding for land conservation, parks and outdoor recreation opportunities. All responses are anonymous.

What is Open Space?

Open space is public or privately owned, undeveloped lands that are important to Warwick residents for a variety of reasons, including recreation, agriculture, forestry, wildlife habitat, clean air, protection of drinking water, or simply because of their scenic qualities and contribution to the overall character of our Town.

*Please take the time to answer all the questions in this survey. We value your input—and welcome **comments, which should be written on a separate sheet or sheets, identified by the number of the question they refer to, and attached to the survey.** Fold the completed survey in half and staple or tape it closed. Then deposit it in the black mailbox in front of Town Hall, or at the Warwick Free Public Library. If you or any family member would like an additional copy of the survey, they are available at the library and can be downloaded from the town Web site www.warwickma.org*

We encourage everyone in a household to fill out a separate questionnaire.

Please return your completed survey by Friday, May 31, 2019

Please place a check mark (✓) or x in the box that best reflects your answer to each of the questions below and write in responses, as appropriate:

A. Your current uses:

A1. Which of the following recreational activities do you and your family pursue in Warwick and elsewhere?

Activity	Pursue in Warwick	Pursue elsewhere	Activity	Pursue in Warwick	Pursue elsewhere
a. Hunting	<input type="checkbox"/>	<input type="checkbox"/>	s. Downhill skiing	<input type="checkbox"/>	<input type="checkbox"/>
b. Fishing	<input type="checkbox"/>	<input type="checkbox"/>	t. Ice skating	<input type="checkbox"/>	<input type="checkbox"/>
c. Hiking	<input type="checkbox"/>	<input type="checkbox"/>	u. Snowshoeing	<input type="checkbox"/>	<input type="checkbox"/>
d. Bird watching	<input type="checkbox"/>	<input type="checkbox"/>	v. Sledding	<input type="checkbox"/>	<input type="checkbox"/>
e. Camping	<input type="checkbox"/>	<input type="checkbox"/>	w. Basketball	<input type="checkbox"/>	<input type="checkbox"/>
f. Boating/power	<input type="checkbox"/>	<input type="checkbox"/>	x. Baseball	<input type="checkbox"/>	<input type="checkbox"/>
g. Boating/non-power	<input type="checkbox"/>	<input type="checkbox"/>	y. Softball	<input type="checkbox"/>	<input type="checkbox"/>
h. Biking—on-road	<input type="checkbox"/>	<input type="checkbox"/>	z. Volleyball	<input type="checkbox"/>	<input type="checkbox"/>
i. Biking—off-road	<input type="checkbox"/>	<input type="checkbox"/>	aa. Tennis	<input type="checkbox"/>	<input type="checkbox"/>
j. Four-wheeling	<input type="checkbox"/>	<input type="checkbox"/>	ab. Rollerblading	<input type="checkbox"/>	<input type="checkbox"/>
k. Dirt biking (motor)	<input type="checkbox"/>	<input type="checkbox"/>	ac. Gardening	<input type="checkbox"/>	<input type="checkbox"/>
l. Snowmobiling	<input type="checkbox"/>	<input type="checkbox"/>	ad. Swimming	<input type="checkbox"/>	<input type="checkbox"/>
m. Jogging	<input type="checkbox"/>	<input type="checkbox"/>	ae. Golfing	<input type="checkbox"/>	<input type="checkbox"/>
n. Walking	<input type="checkbox"/>	<input type="checkbox"/>	af. Picnicking	<input type="checkbox"/>	<input type="checkbox"/>
o. Horseback riding	<input type="checkbox"/>	<input type="checkbox"/>	ag. Rock climbing	<input type="checkbox"/>	<input type="checkbox"/>
p. Cross-country skiing	<input type="checkbox"/>	<input type="checkbox"/>	ah. Football	<input type="checkbox"/>	<input type="checkbox"/>
q. Geocaching	<input type="checkbox"/>	<input type="checkbox"/>	ai. Skateboarding	<input type="checkbox"/>	<input type="checkbox"/>
r. Soccer	<input type="checkbox"/>	<input type="checkbox"/>	Other (specify):	<input type="checkbox"/>	<input type="checkbox"/>

B. Your views on land use and conservation

B1. Please indicate the importance of each of these in your decision to live in Warwick:

	Very Important	Important	Not Important	N/A ¹
a. Rural or small-town character	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b. Open fields, forests and trails	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c. Peace and quiet	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
d. Access to state forests	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
e. Air/water quality	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
f. Public services	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
g. Local climate	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
h. Safety from crime and vandalism	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
i. Public school system	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
j. Affordable housing	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

	Very Important	Important	Not Important	N/A
k. Recreational opportunities	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
l. Friends or relatives here	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
m. Easy commuting	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
n. Five-College area	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
o. Job opportunities in the area	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
p. Participatory governance	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
q. My/our perception of town values	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
r. Access to major shopping areas	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
s. Well maintained town infrastructure	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
t. Moores Pond Beach	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Other (Specify):	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

B2. How important do you consider it to conserve these natural and scenic resources?

	Very important	Important	Not important	N/A ²
a. Dirt roads	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b. Woods roads	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c. State Forests managed for wildlife	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
d. State Forests managed for timber	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
e. Private forests	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
f. Open fields	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
g. Rural character	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
h. Scenic views	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
i. Stone walls	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
j. Lakes/streams/ponds	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

	Very important	Important	Not important	N/A
k. Wetlands	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
l. Wildlife habitat	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
m. Clean drinking water	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
n. Trails	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
o. Farmland	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
p. Historic structures	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
q. Clean air	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
r. Wilderness	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
s. Town center and commons	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Other (specify):	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

B3. Please indicate the level of your support of each of the following actions designed to protect/conservate open spaces and natural resources:

	Strongly support	Support	Neutral	Oppose	Strongly oppose
a. Town purchase of conservation land	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b. Town purchase of development rights	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c. Zoning changes for open space protection	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
d. No additional town actions should be taken.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
e. Acceptance of donated conservation land	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
f. Acceptance of donated development rights	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
g. Encourage conservation by private non-profits	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
h. Encourage sustainably managed forests & farms	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

	Strongly support	Support	Neutral	Oppose	Strongly oppose
i. Encourage conservation by state agencies	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
j. Encourage use of Ch.61 (Forest Tax Law) to lower taxes on forest land	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
k. Encourage use of Ch.61A (Farmland Tax Law) to lower taxes on farmland	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
l. Encourage use of Ch.61B (Recreation Tax Law) to lower taxes on recreation land	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Other (specify):	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

B4. How has each of the following changed while you have lived in Warwick?

	Changed for the Better	About the Same	Changed for the Worse	No Opinion/Unsure
a. local open space	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b. sense of community	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c. Warwick's rural character	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

	Changed for the Better	About the Same	Changed for the Worse	No Opinion/Unsure
d. recreational facilities	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
e. recreational programs	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
f. level of new development	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

¹ NA = "does not apply" or "I do not consider this to be true of Warwick."

² NA = "does not apply" or "Warwick does not have this resource to conserve."

B5. Which of the following do you consider appropriate use of town land?

	Appropriate	Inappropriate	Unsure		Appropriate	Inappropriate	Unsure
a. "Passive" recreation (hiking, <i>etc.</i>)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	e. Institutional/commercial development	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b. License for private recreation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	f. Open space	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c. "Active" recreation (tennis, softball, <i>etc.</i>)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	g. Community buildings	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c. License for private development	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	h. Community infrastructure (water, sewer, <i>etc.</i>)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
d. Low-income housing	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	i. Sustainable forest management	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
				Other (<i>specify</i>):	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

B6. What uses of Town-owned buildings in Warwick would you like the Town to consider? Please specify:

B7. Do you feel the town should develop Fire Ponds and dry hydrants throughout town to aid in firefighting? ☐Yes ☐No ☐Unsure

Alternatives? (*specify*): _____

B8. Should the Commonwealth do more to develop its land in Warwick for the following uses?

	Yes	No	Unsure		Yes	No	Unsure
a. Hiking	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	i. Four-wheeling (off-road vehicular use)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b. Trail riding (bridle paths)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	j. Dirt biking	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c. Camping	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	k. Mountain biking	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
d. Skiing	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	l. Tennis/badminton courts	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
e. Boating	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	m. Volleyball court	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
f. Fishing	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	n. Softball/baseball/soccer/football fields	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
g. Swimming (<i>Sheomet Pond, Laurel Lake</i>)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	o. Commercial/institutional purposes	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
h. Snow-mobiling	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	p. Wildlife habitat & biodiversity	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
				Other (<i>specify</i>):	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

B9. Should Warwick encourage or discourage the following in town?

	Encourage	Discourage	No Opinion		Encourage	Discourage	No Opinion
a. Hiking	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	g. Swimming	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b. Horseback riding	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	h. Snow-mobiling	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c. Camping	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	i. Four wheeling	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
d. Skiing	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	j. Dirt biking (motorized)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
e. Boating	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	k. Mountain biking	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
f. Fishing	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	l. Road biking	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
				Other (<i>specify</i>):	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

B10. Should Warwick identify and protect historical and archeological sites in town?

☐Yes ☐No ☐Unsure

Should town historical and archeological sites be made more accessible? ☐Yes ☐No ☐Unsure

B11. Should Warwick try to obtain trail rights through private lands? ☐Yes ☐No ☐Unsure

Would you support publicly-funded trail maintenance? ☐Yes ☐No ☐Unsure

C. Demographics

C1. Is any of your household income derived from natural resources (*e.g.*, forest products, maple syrup, cordwood, farming, camping, trapping, gravel pits, *etc.*)? ☐Yes ☐No

If Yes, please indicate the natural resource(s): _____

C2. Have you had your drinking water tested in the past five years? ☐Yes ☐No ☐Unsure

C3. What is the source of your drinking water?

- ☐ a. Deep well ☐ c. Spring ☐ e. Don't know
☐ b. Shallow well ☐ d. Commercial source/store ☐ f. Other (*specify*): _____

C4. How long have you lived in Warwick?

- ☐ a. Fewer than five years ☐ c. Between ten and fifteen years
☐ b. Between five and ten years ☐ d. More than fifteen years

C5. Which TEN of these aspects of life in Warwick mean the most to you? (Choose up to 10)

- | | | |
|---|---|---|
| <input type="checkbox"/> a. Large road-side trees | <input type="checkbox"/> j. Scenic views | <input type="checkbox"/> s. Slower traffic |
| <input type="checkbox"/> b. Dirt roads | <input type="checkbox"/> k. Narrow, winding roads | <input type="checkbox"/> t. Lower housing density |
| <input type="checkbox"/> c. Historic cellarholes | <input type="checkbox"/> l. Large forested areas | <input type="checkbox"/> u. No city lights |
| <input type="checkbox"/> d. Historic structures | <input type="checkbox"/> m. Walking and hiking trails | <input type="checkbox"/> v. Clean streams and bodies of water |
| <input type="checkbox"/> e. Vernal pools | <input type="checkbox"/> n. Mount Grace | <input type="checkbox"/> w. No industrial/commercial strips |
| <input type="checkbox"/> f. State forests | <input type="checkbox"/> o. Local ponds and lakes | <input type="checkbox"/> x. The people |
| <input type="checkbox"/> g. Open fields | <input type="checkbox"/> p. Quiet | <input type="checkbox"/> y. The school system |
| <input type="checkbox"/> h. Farmhouses | <input type="checkbox"/> q. Low traffic volume | <input type="checkbox"/> z. The recreational opportunities |
| <input type="checkbox"/> i. Moores Pond Beach | <input type="checkbox"/> r. Library | <input type="checkbox"/> Other(s) (<i>specify</i>): _____ |

C6. Where does the main income in your household come from?

- ☐ a. Warwick-based work ☐ c. Telecommute ☐ e. None of the above
☐ b. Commute to work ☐ d. Retired

C7. Do you own Property in Warwick? ☐ Yes ☐ No

If you own one or more dwellings in Warwick, which of the following apply to them?

- ☐ a. I live here year-round ☐ c. I rent out one or more dwellings ☐ e. None of the above
☐ b. I live here seasonally ☐ d. I rent out rooms or a dwelling as a B&B or short-term vacation rental

C8. How many acres do you own in Warwick?

- ☐ a. None ☐ c. Between two and ten ☐ e. More than fifty acres
☐ b. Fewer than two acres ☐ d. Between ten and fifty

C9. Please use the blanks to write the number of people in each of the following age groups in your household.

_____ 0 to 19 years _____ 45 to 64 years _____ 79 years and older
 _____ 20 to 44 years _____ 65 to 78 years

C10. What is your age?

_____ 0 to 19 years _____ 45 to 64 years _____ 79 years and older
 _____ 20 to 44 years _____ 65 to 78 years

C11. If made available, which of the following activities would you or your household members participate in?

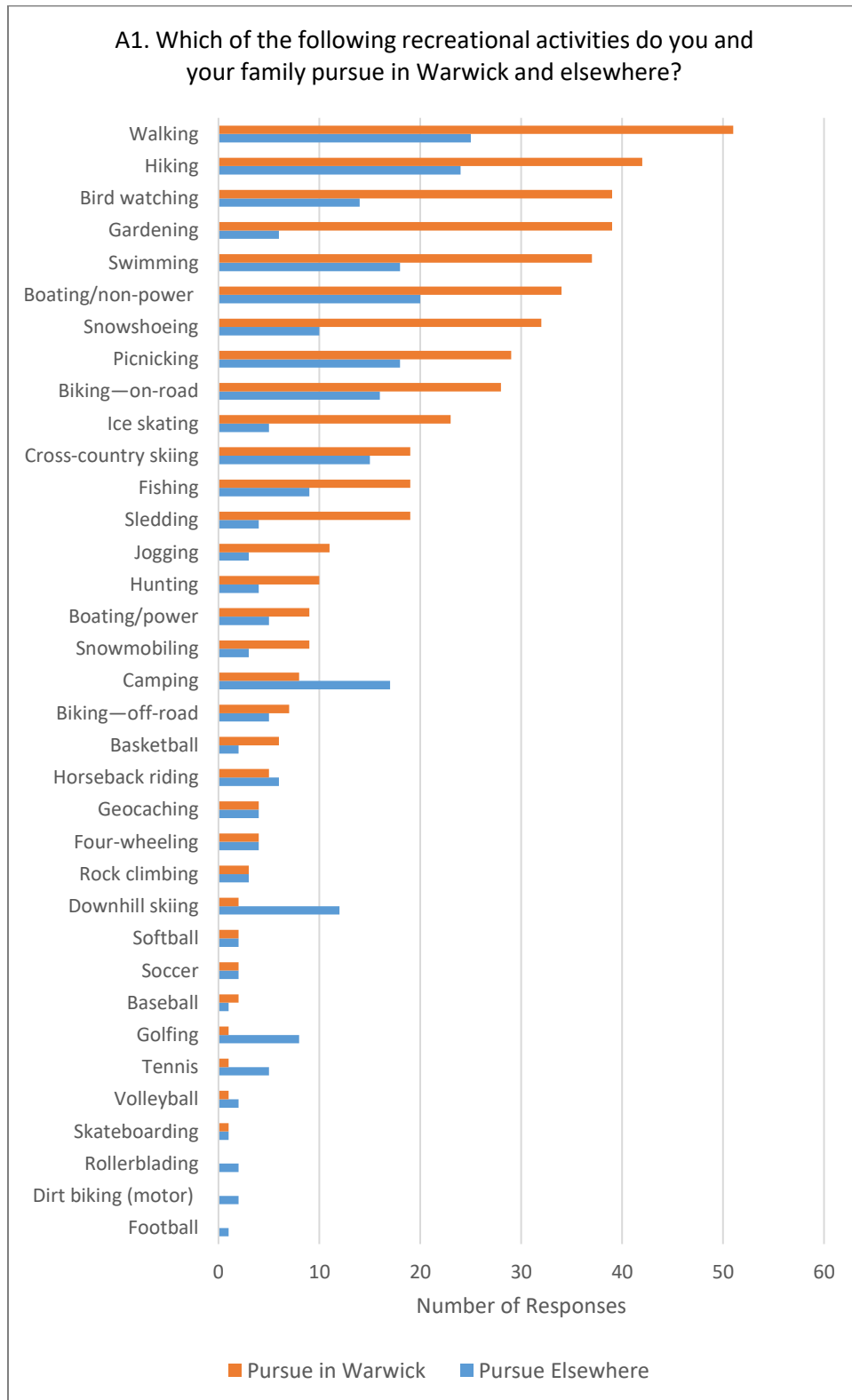
- ☐ a. Bird walks ☐ c. Forestry demonstration
☐ b. Vernal pool walks ☐ d. Other environmental education (*specify*): _____

C12. Please list below any specific areas in town (ponds, shores, stream banks, trails, other natural or historical areas) that you feel the town should try to protect or keep natural:**C13. Please provide additional comments on any of the questions above or add information or opinions we have not asked about (e.g., suggested additional amenities for teenagers, seniors, or disabled people):**

Thank you very much for taking the time to complete this survey!

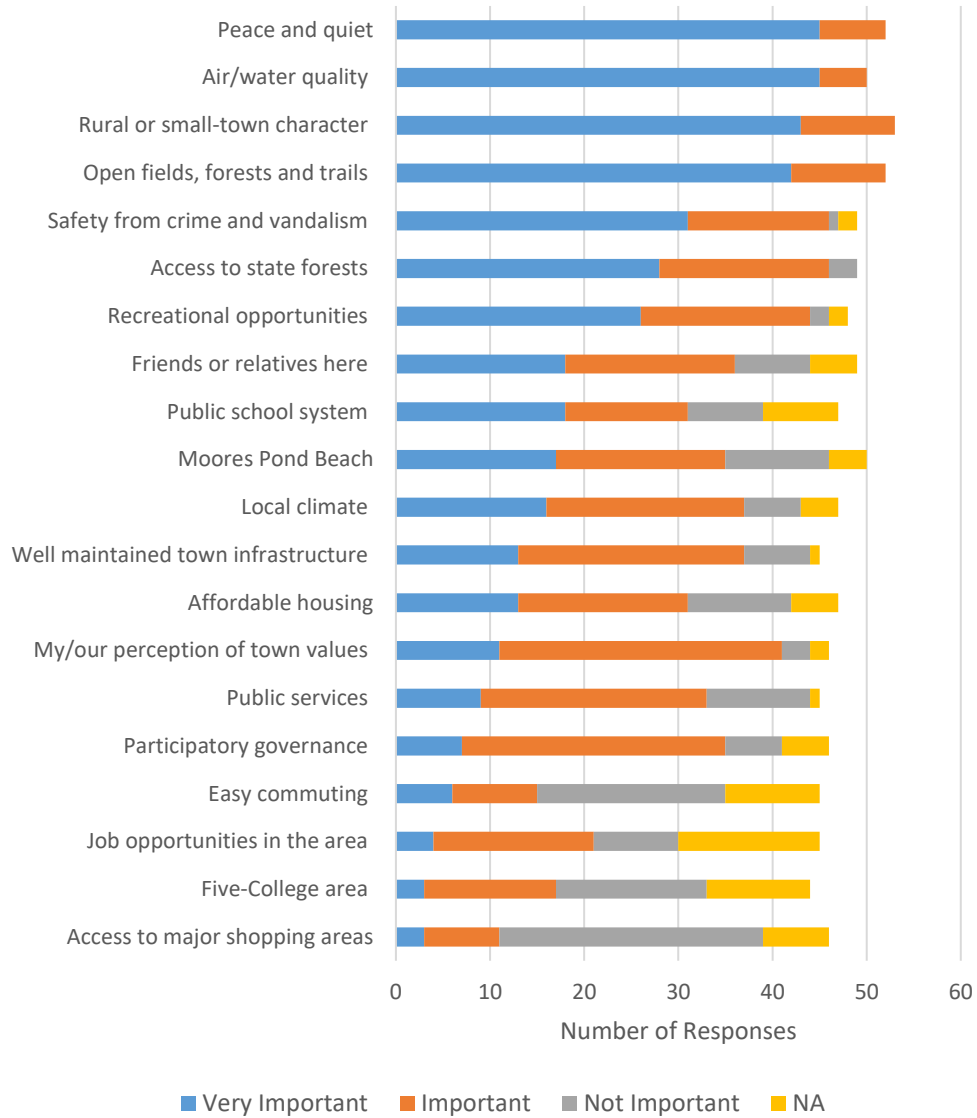
Warwick 2019 Open Space and Recreation Survey Results

- Total Surveys Returned: 53
- Percent of Residents: 7%
- Percent of Households: 15%



Other: Frisbee golf, Botanizing, Snorkeling, Relaxing by the pond

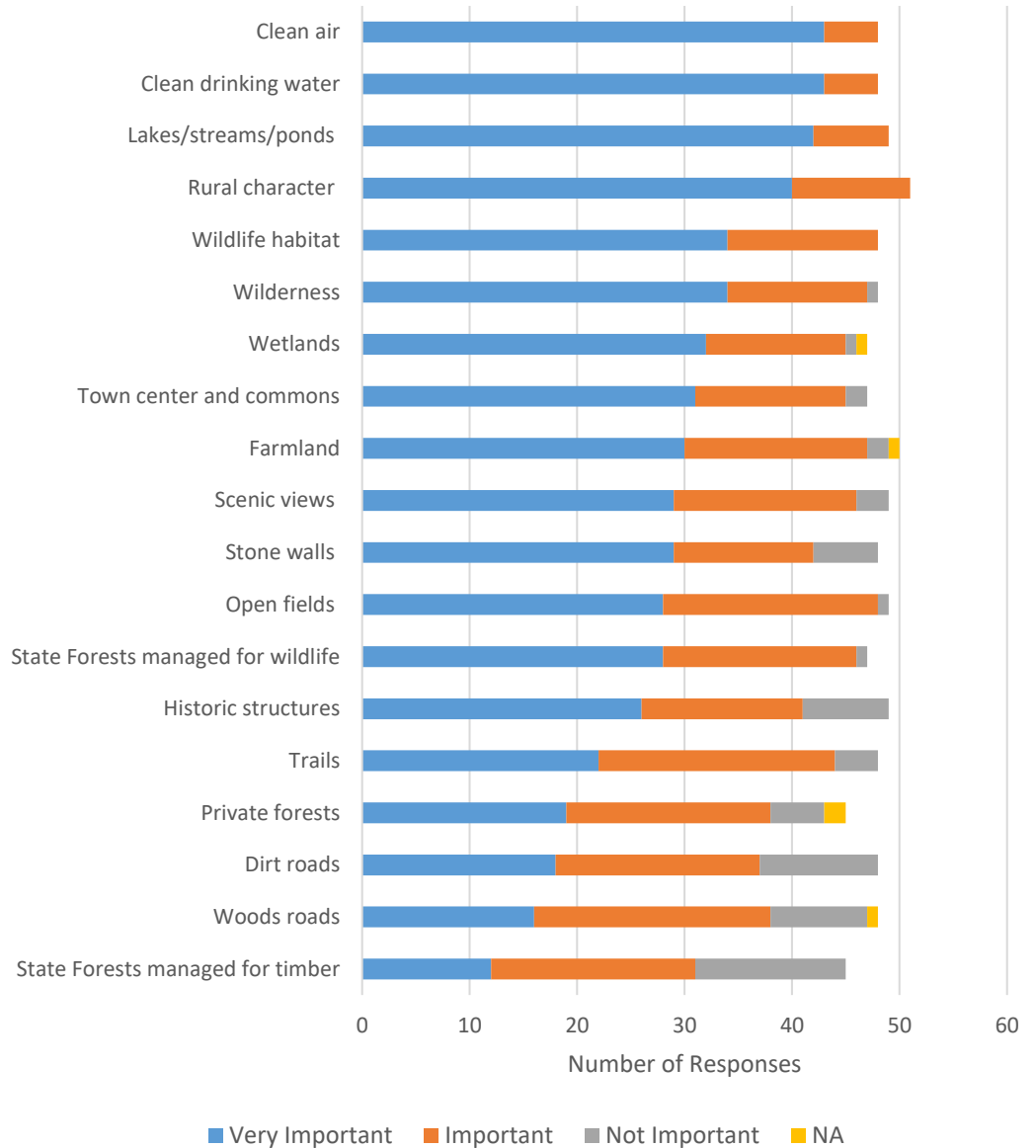
B1. Please indicate the importance of each of these in your decision to live in Warwick:



Other:

- Town of employment
- Grew up here
- Internet connection
- Hastings Pond
- Water quality of Moores Pond Beach
- Husband

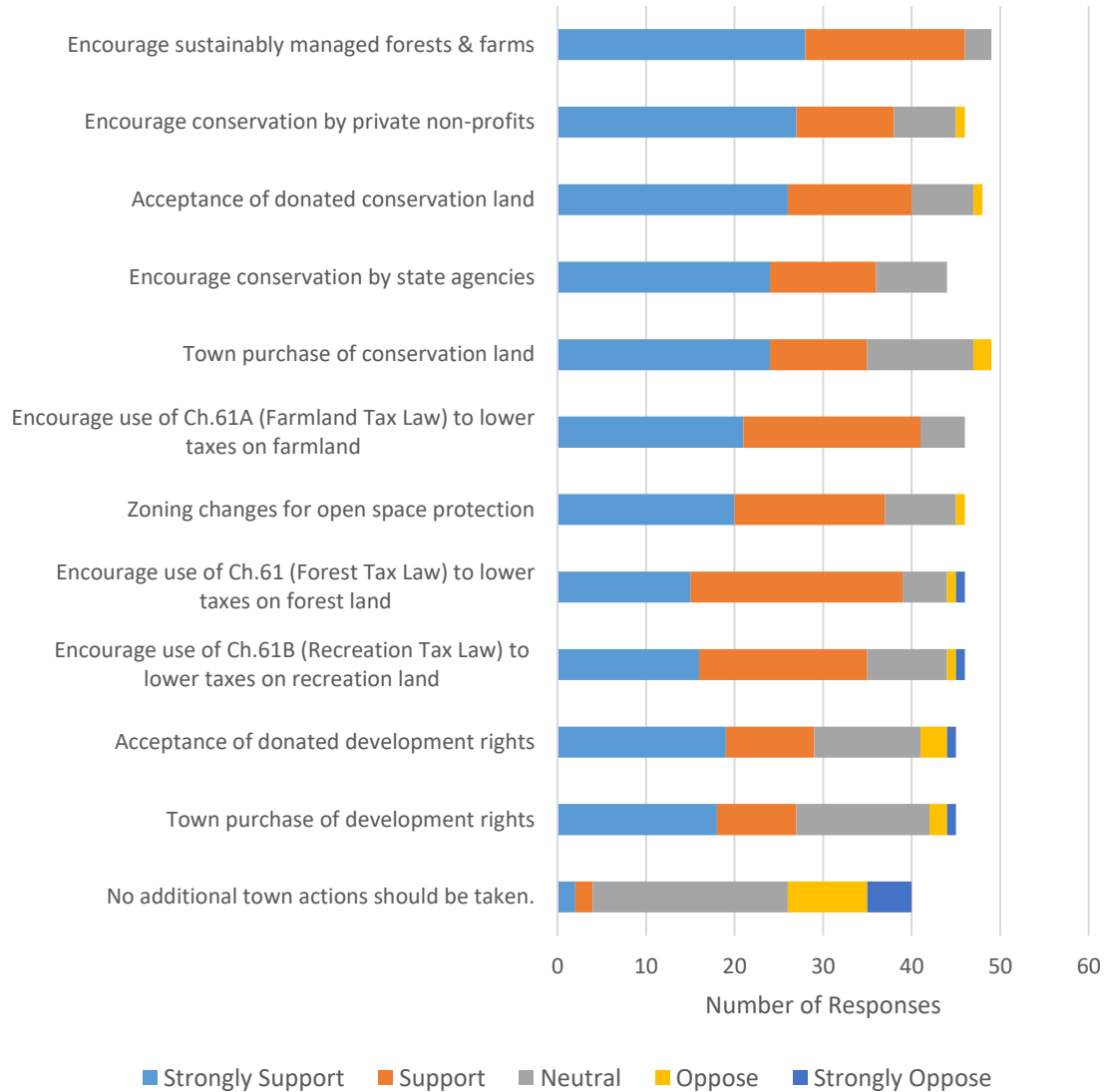
B2. How important do you consider it to conserve these natural and scenic resources?



Other:

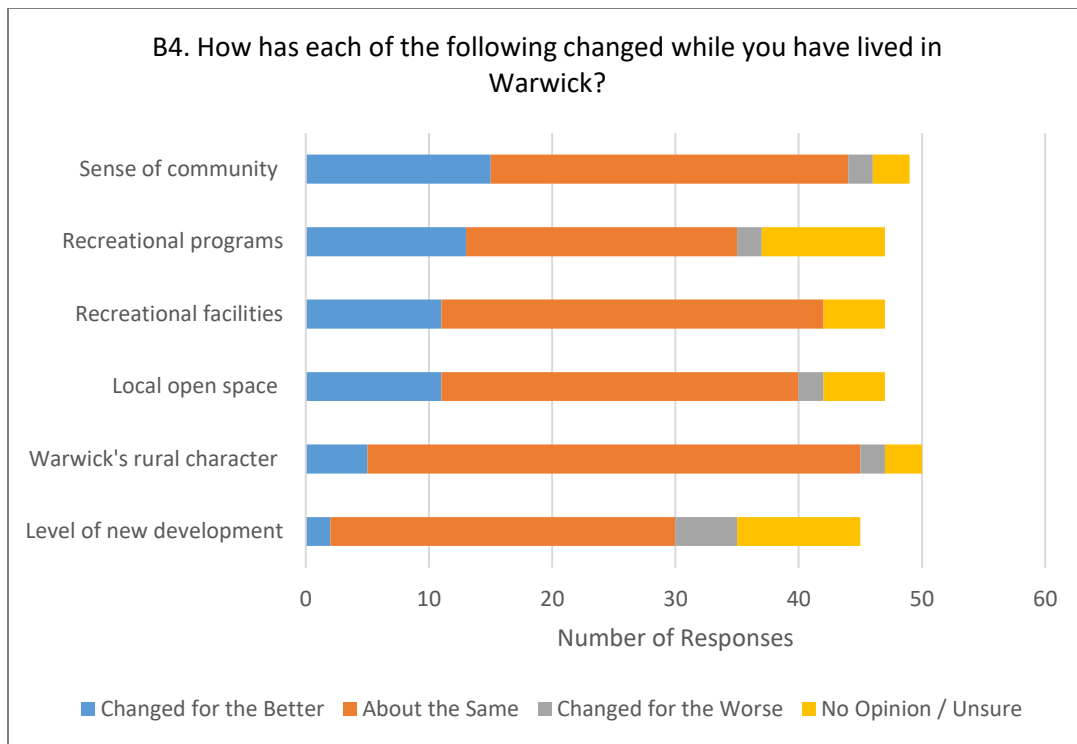
- Narrow roads to cut down on traffic
- Cemeteries
- At least one picnic area

B3. Please indicate the level of your support of each of the following actions designed to protect/conserv
actions designed to protect/conserv open spaces and natural resources:



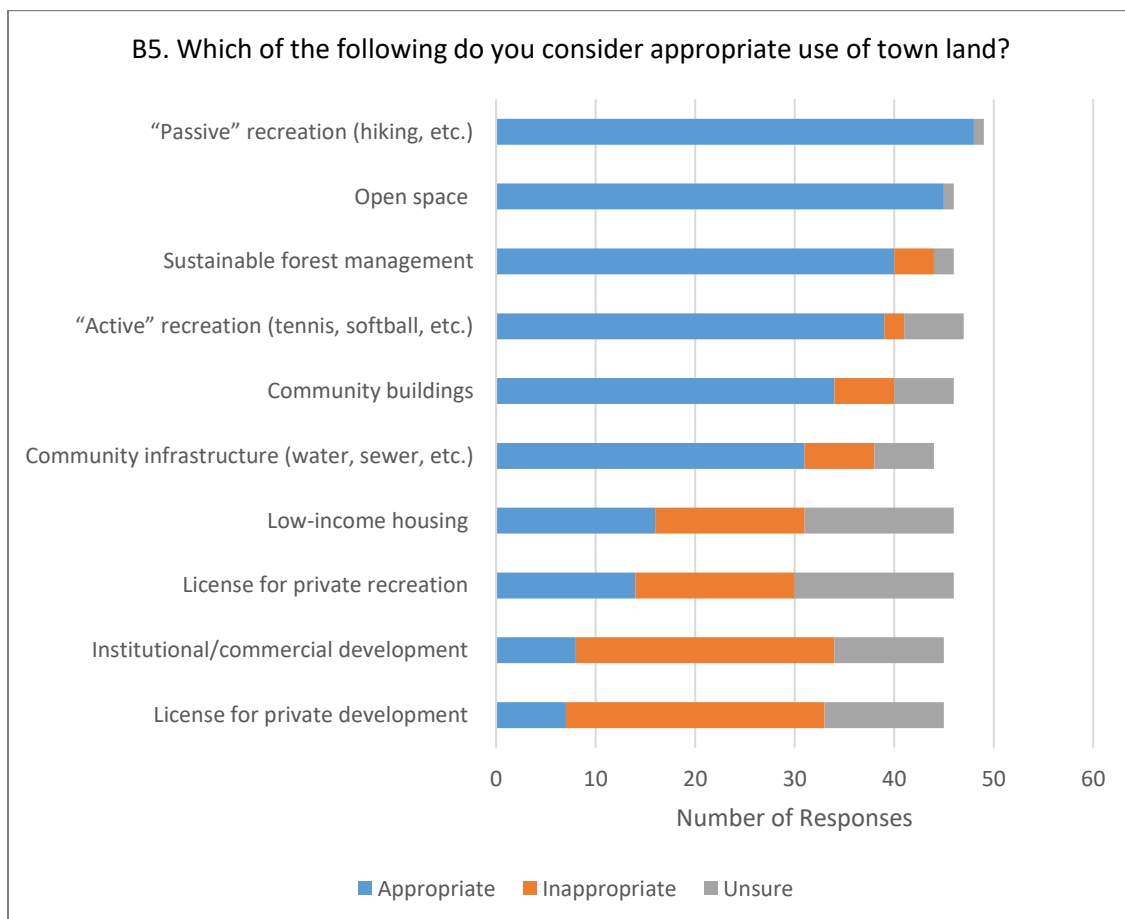
Other:

- The Forestry Committee could do some public education on the value of leaving woods undisturbed.



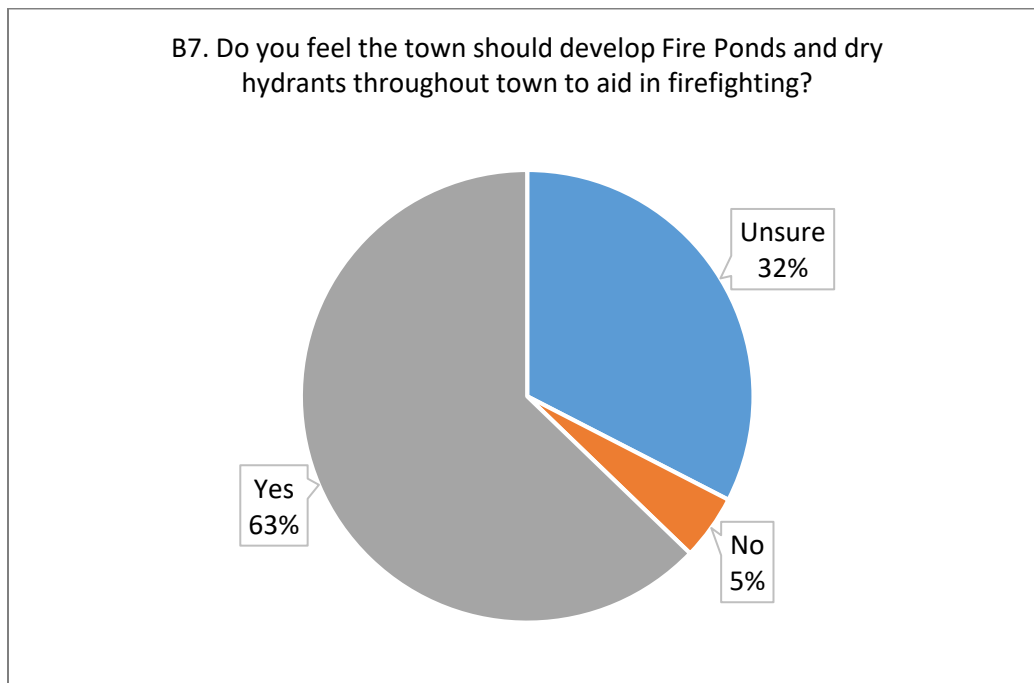
Other:

- Fire house
- Haven't lived here long enough to answer these but we really like the way everything is going so far.



B6. What uses of Town-owned buildings in Warwick would you like the Town to consider? Please specify:

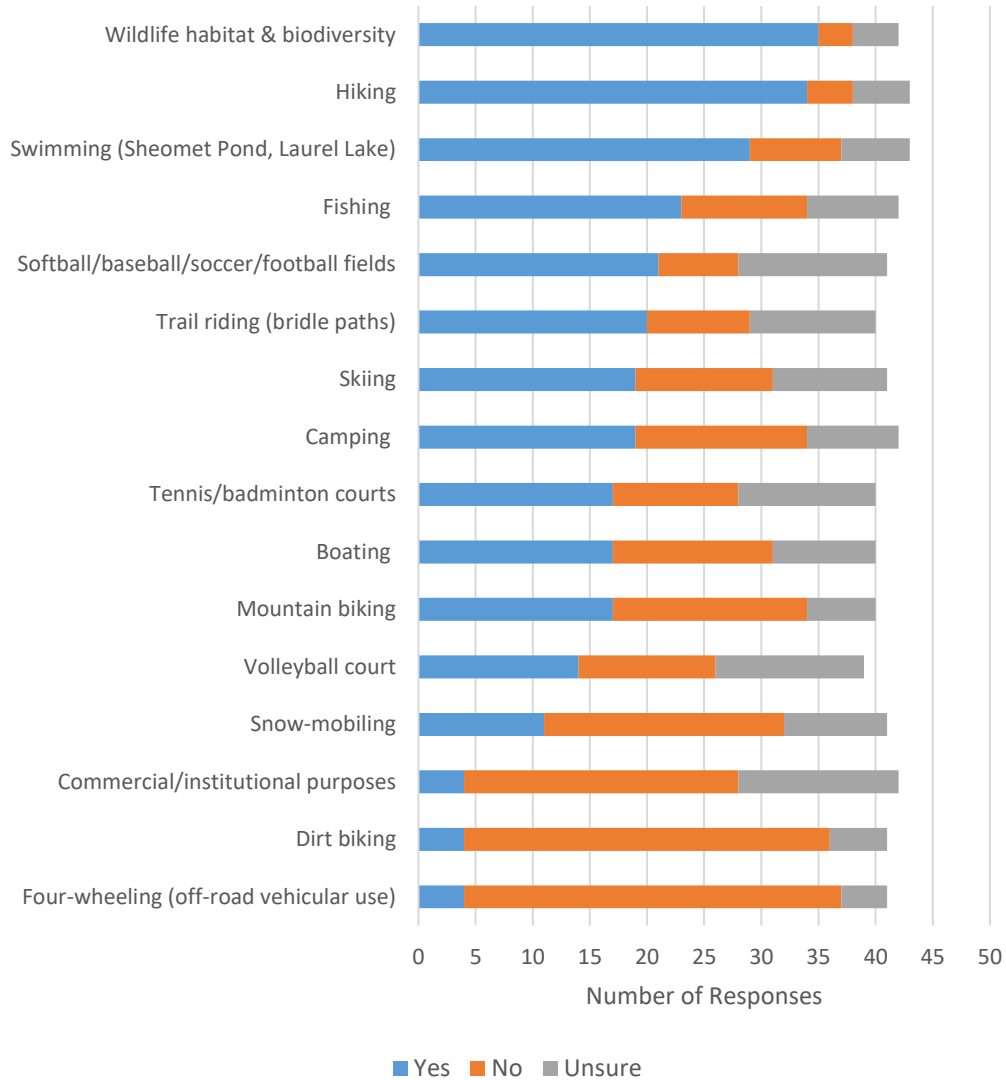
- Community Center
- Brewery
- Use former Fire Station for broadband department
- Warwick Historical Society move to old Fire Station? Senior housing?
- No opinion
- Not sure
- The highway dept. Building is so old that it's an historic structure. If the Town passed the Community Preservation Act, it could use the money to build a truck wash at the Town Barn. We will probably be forced to build one anyway, and this way the State would pay for it.
- Arts center, senior center - in old fire house, school
- IF WCS closes at some point, use for some town offices, recreation space
- Local shelter for elderly during storms or hot water.
- Senior living and/or involvement at WCS
- Senior housing development on Warwick School campus
- Recreation programs speakers crafts music private parties etc.
- Any kind of cultural or recreational (touristic) use



Comments:

- I'd like to know more about this - also to know how plans influence property tax rates.
- Leave it up to the Fire Dept.
- If the fire department wants to, I would support

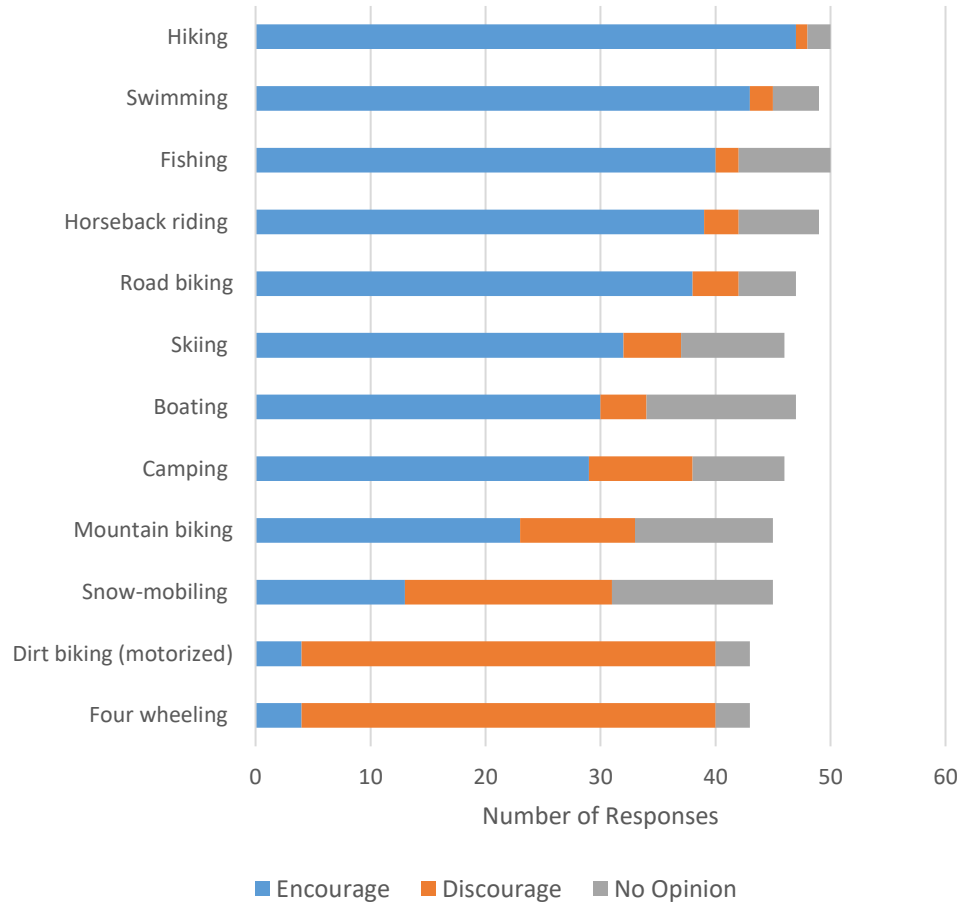
B8. Should the Commonwealth do more to develop its land in Warwick for the following uses?



Other:

Picnic area at Mt. Grace

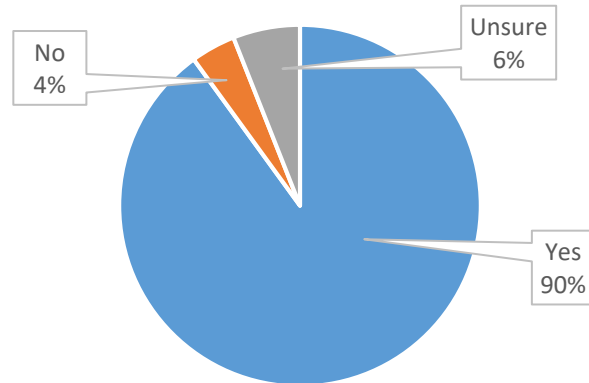
B9. Should Warwick encourage or discourage the following in town?



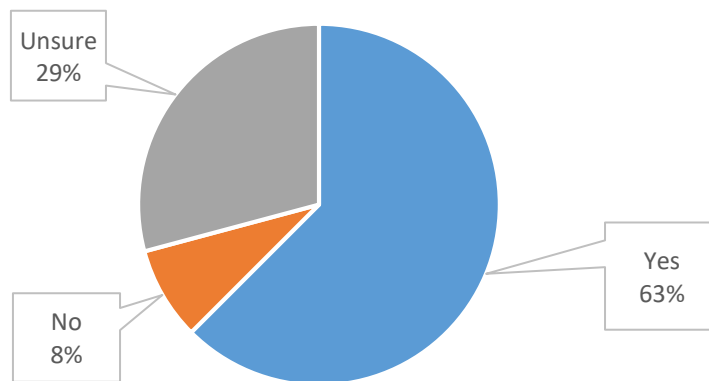
Comments:

- Skiing – cross-country, not downhill (3)
- Boating – no motors (4)
- Dirt biking – limited and designated

B10. Should Warwick identify and protect historical and archeological sites in town?



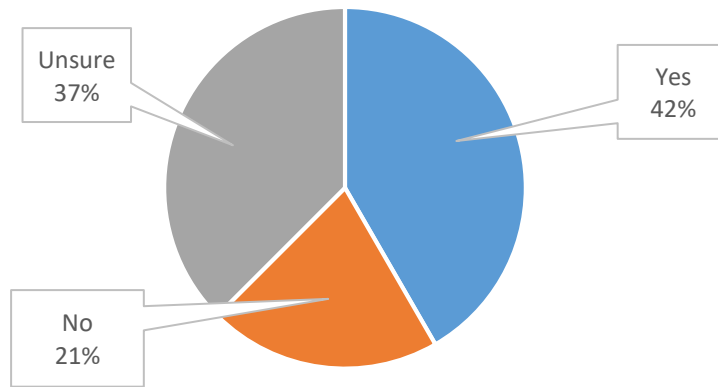
Should town historical and archeological sites be made more accessible?



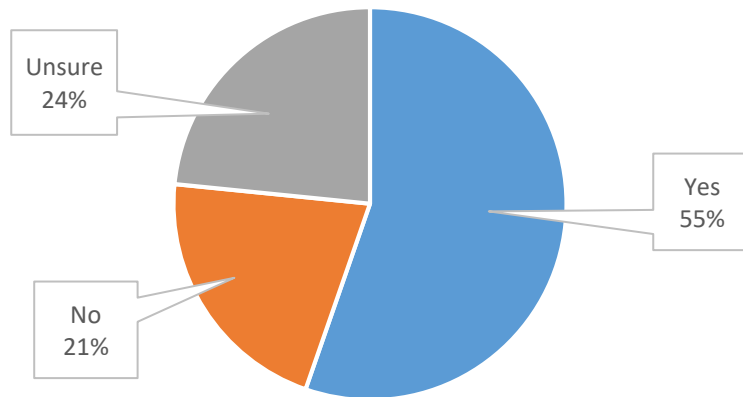
Comments:

- People and archeological sites don't mix
- Kidder Falls

B11. Should Warwick try to obtain trail rights through private lands?

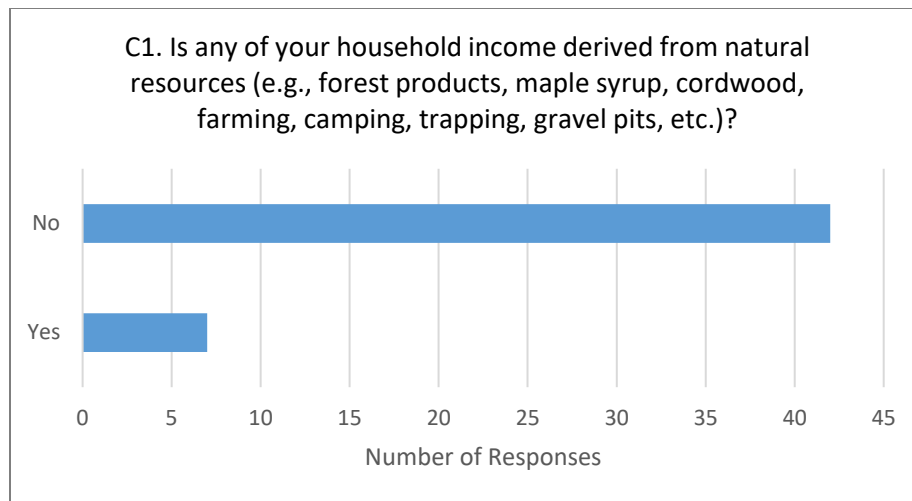


Would you support publicly-funded trail maintenance?



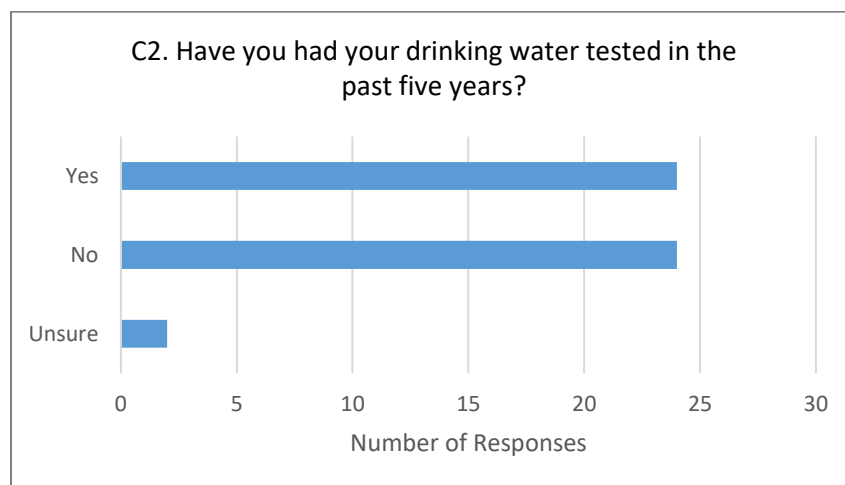
Comments:

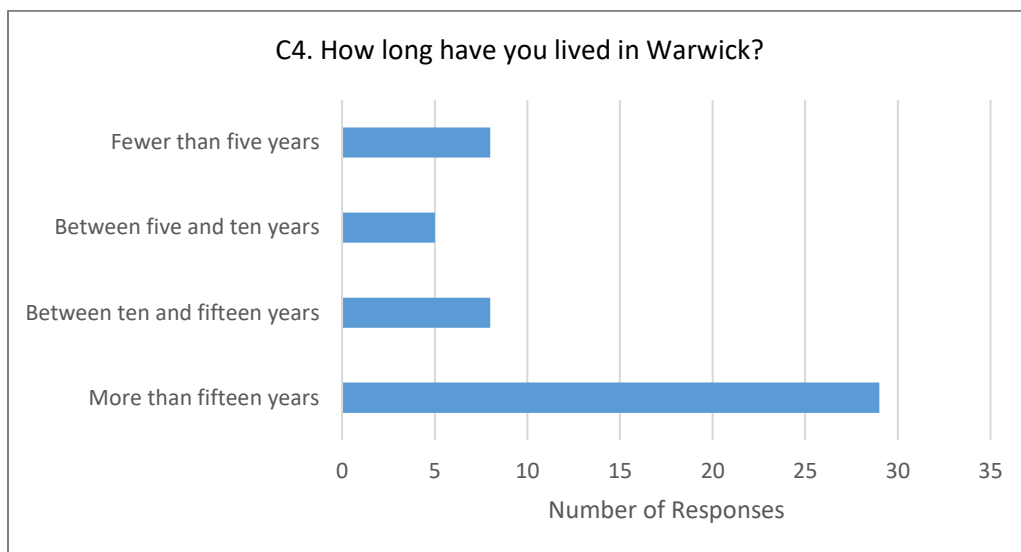
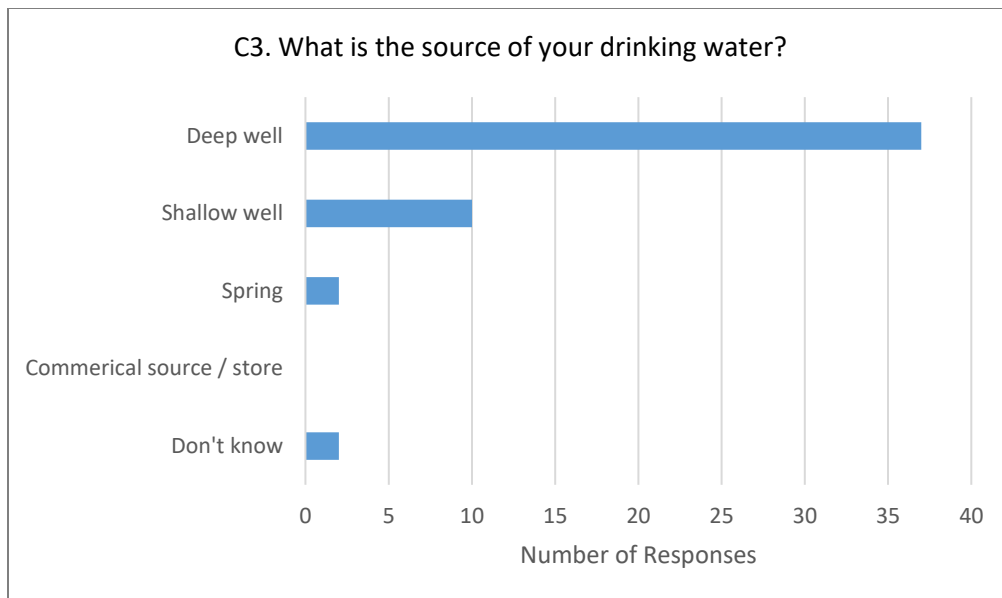
Please use Town funds to pay for the summer water testing at Moores Pond Beach



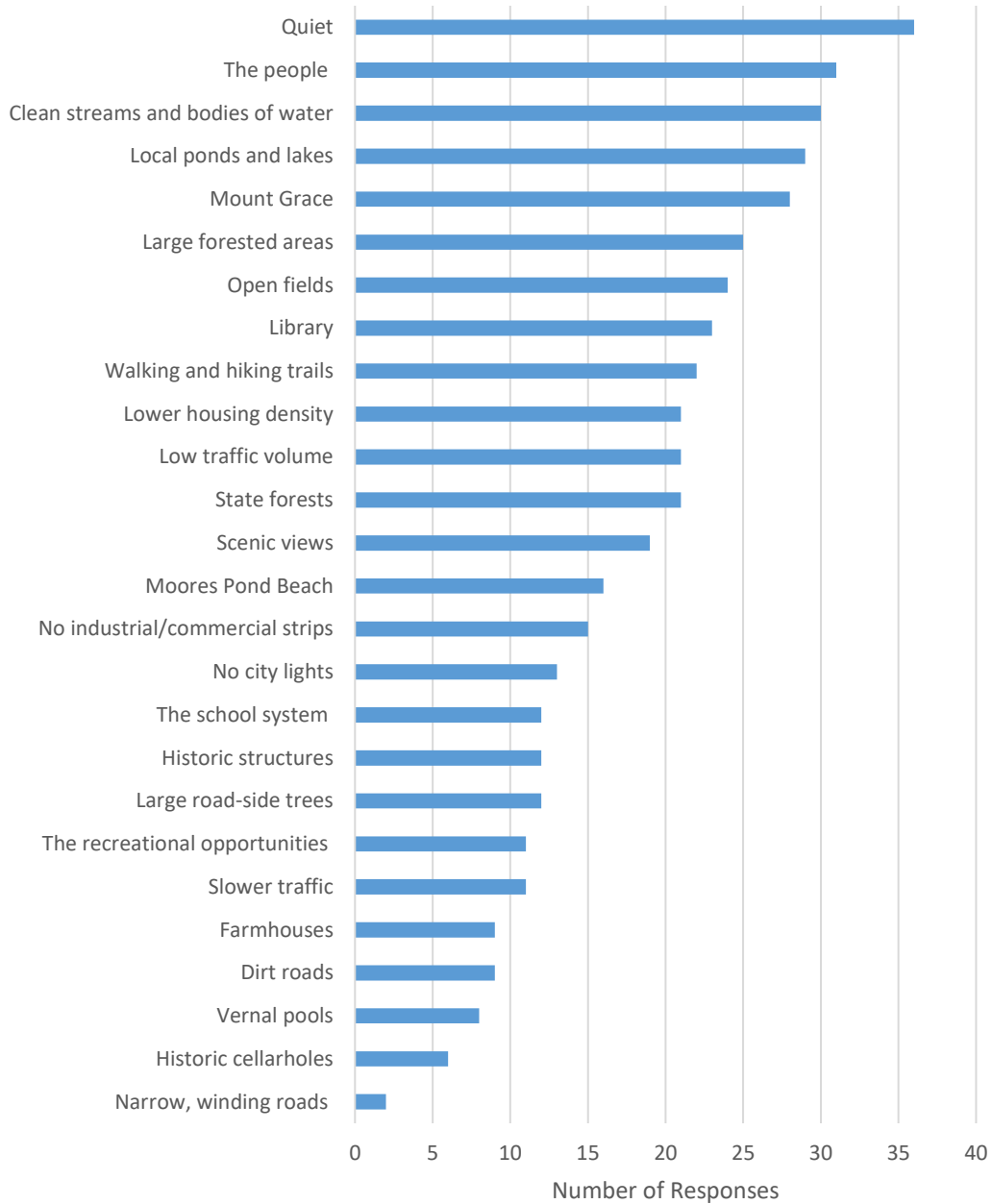
If Yes, please indicate the natural resource(s):

- Hay and sale of farm raised veggies
- natural habitats outside Warwick
- wood
- farming
- cordwood - occasional
- cottage rental on Pond





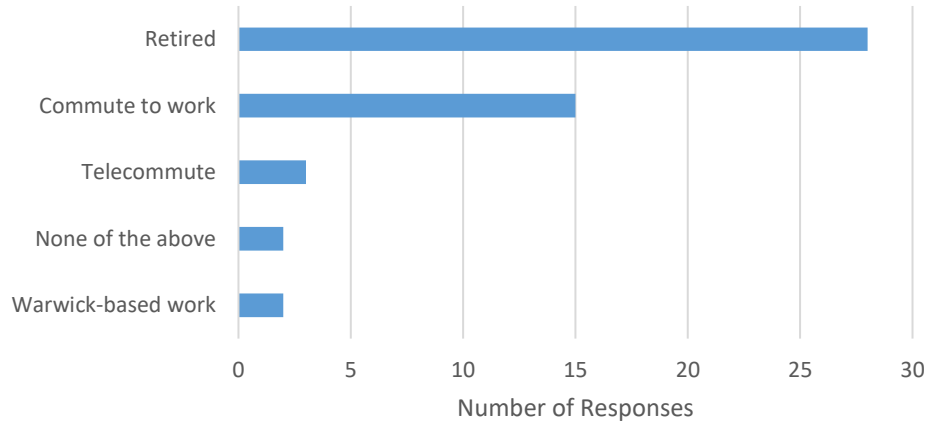
C5. Which TEN of these aspects of life in Warwick mean the most to you?



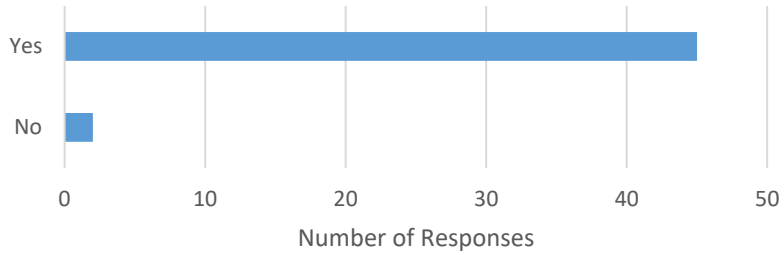
Comments:

Mount Grace - trim out so it has a nice view from the top. Growing up fast
 Slower traffic – It isn't slower

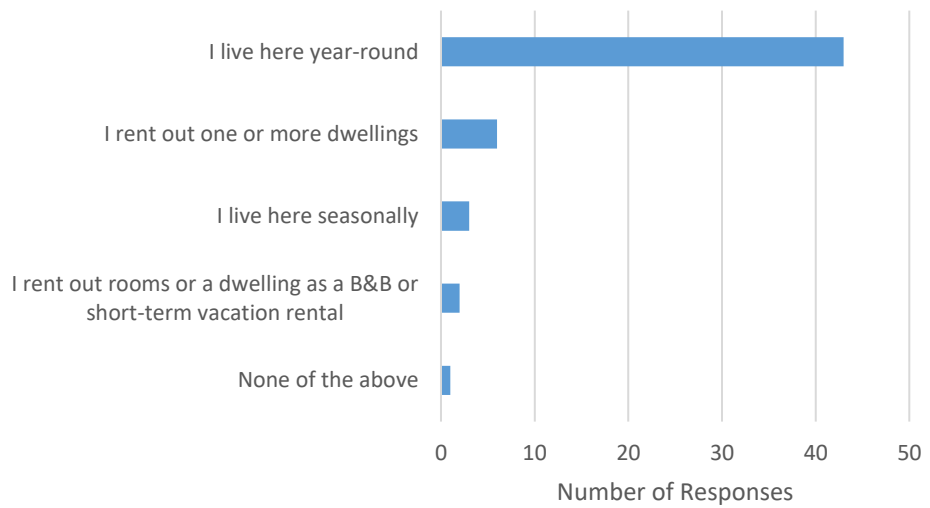
C6. Where does the main income in your household come from?

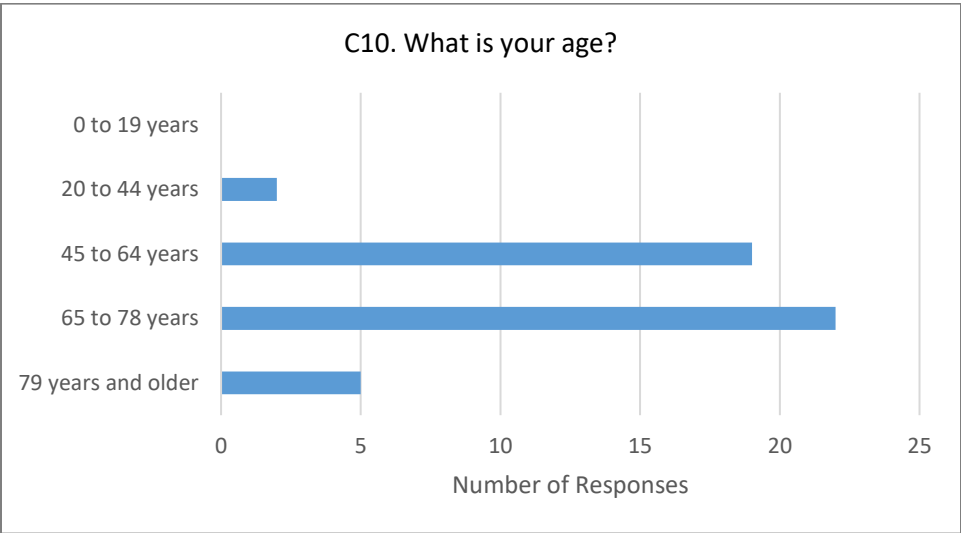
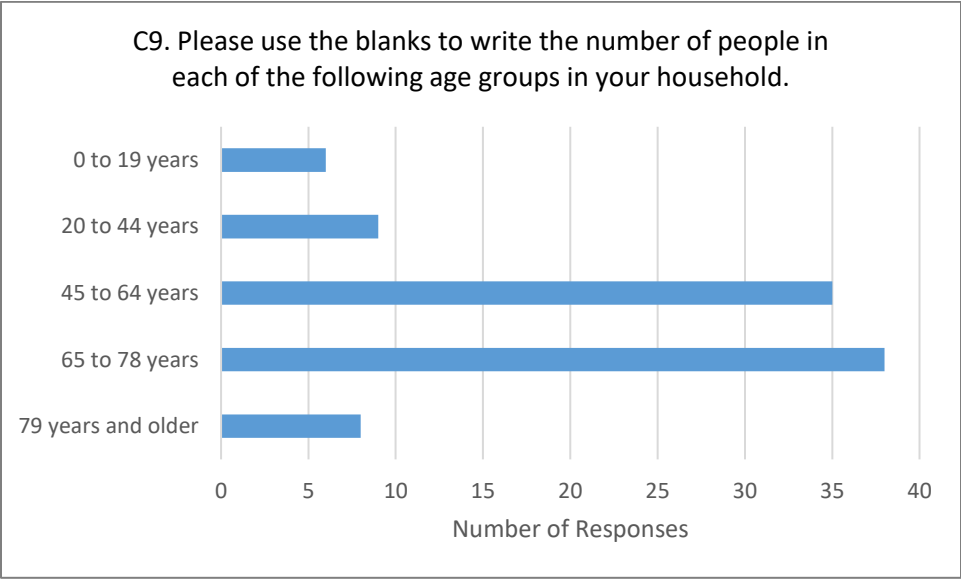
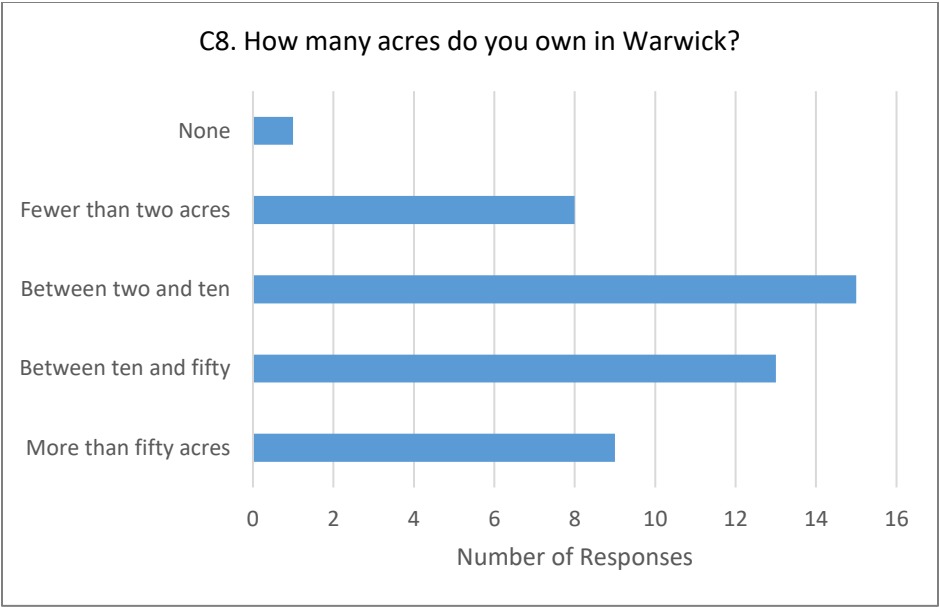


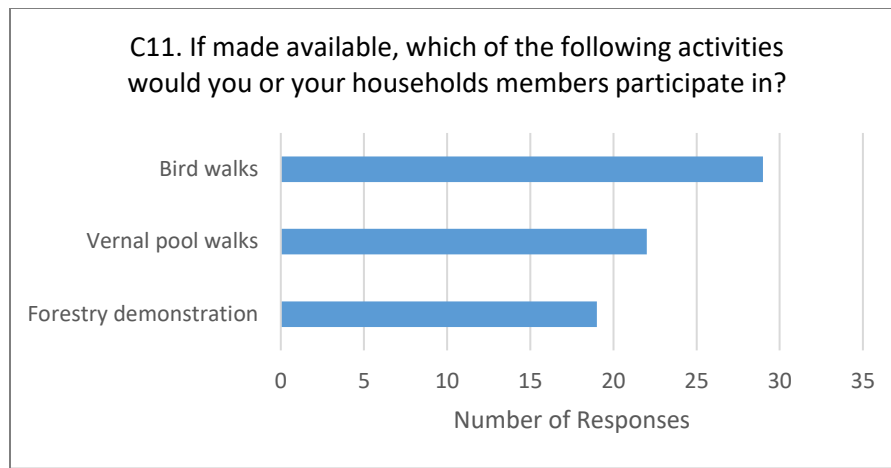
C7. Do you own property in Warwick?



If you own one or more dwellings in Warwick, which of the following apply to them?







Other environmental education:

- other natural history interpretive walks (1)
- walks with plant topics such as mushrooms or wildflowers (1)
- Identification of flowers, shrubs, trees (1)
- historical hikes / historic resources (2)
- Botany, tracking (1)
- Nature walks (1)
- Animal tracking (1)
- Group hikes (1)
- Wetland management (1)
- native species landscaping (1)
- alien species control (1)
- flowers, plants (1)

C12. Please list below any specific areas in town (ponds, shores, stream banks, trails, other natural or historical areas) that you feel the town should try to protect or keep natural:

Gale Brook Valley	1
Moores Pond	3
All of the above	2
None other than already indicated	1
Roadsides. The town needs an exotic invasive plant control program	1
Sheomet Pond (Clubhouse Pond)	2
Hastings Pond	3
Bass Swamp	1
Ponds, stream banks, trails	1
Mt. Grace	2
Trails, historical areas	1
Land not protected around Sheomet Pond, Cutting property in NW Warwick	1
Ponds	1
Surrounding forests	1
Mt. Grace picnic area should be fix back up	1
Moores Pond beach - Town/ Open Space/ Recreation should pay for water testing not make committee members hold bake sale (lasagna dinner)	1
Gale Road Pond	1
Ponds and trails	1

C13. Please provide additional comments on any of the questions above or add information or opinions we have not asked about (e.g., suggested additional amenities for teenagers, seniors, or disabled people):

- "Historical Trail" Maps, points of interest, i.e. cellar hole of tavern where Daniel Shays men stayed - Old Winchester Rd. (privately owned)
- Club House Pond should be trimmed out so it can be seen from the road so it will not be so badly vandalized like it is. Open it up. It is beautiful, why hide it?
- Guided hikes to local scenic spots in town - Indian caves, waterfalls, cemeteries, etc. - have been wonderful. They help connect Townsfolk with what's in our backyards. That knowledge develops an interest in protecting it.
- It would be great if we kept the school, hopefully we will, I think all resources \$ should go there right now.
- "e.g. suggested additional amenities for teenagers, seniors, or disabled people" - ditto; agree
- I wish there were a sidewalk beside Rt 78. People would walk, and see each other. Informal contact strengthens a community. Many people are afraid to walk in the woods alone (too many movies) but will walk on a sidewalk. If Northfield can get a bridge, we could get a sidewalk.
- Sidewalks on busy roads.
- The abundant amount of State and local forest is a resource we cannot see go to waste. Trail upkeep and maintenance are of high importance to our household so we can enjoy these areas of trails for many years to come.
- Need transportation assistance for seniors; need better internet connectivity - if people can telecommute to work, younger people might be able to live here; need to encourage some green industry to attract younger people to move here so they can find work.
- Volunteer transportation for elderly/disabled
- Encourage more opportunities for commercial development that would contribute to the tax base.
- Residences age over 65 or 70 should get a tax break if live here over 20 or 25 years; we would help the seniors more to be able to stay in their home
- We need to have the State property (pay for the land taxes) they own in town at fair value
- Town ownership of parklands, nature preserves, or conservation easements should begin with a management plan with attached fiscal notes that explain the stewardship of the property that will ensure its ecological or recreational integrity in perpetuity. This is especially important if using other than Town funding sources. If this responsibility is too expensive, the Town would be better served to work to protect property through other agency ownership.
- Support the Moores Pond Beach Committee with Town funds!
- Public transportation

APPENDIX C

ADA Self-Evaluation Report



Town Of Warwick

Town of Warwick
12 Athol Road
Warwick, MA
01378

Phone: 978-544-6315
FAX: 978-544-6499
coordinator@town.warwick.ma.us
www.town.warwick.ma.us

Selectboard:
Lawrence Pruyne, chair
Todd Dexter
Brian Snell

January 13, 2021

Re: Town of Warwick open space plan

Melissa Cryan
Massachusetts Division of Conservation Services
100 Cambridge Street, 9th Floor
Boston, MA 02114

Dear Ms. Cryan:

The town's ADA coordinator, J. David Young provides the following statement:

"I certify that the Town of Warwick's employment practices are in compliance with the Americans for Disabilities Act.

"Issues regarding recruitment, personnel action, leave administration, training, tests, medical exams, questionnaires, fringe benefits, wage and salary administration, and grievance procedures are covered under the town of Warwick personnel policy which was most recently updated in 2016

"This nondiscrimination position or policy is declared on the home page of the towns official website www.town.warwick.ma.us and as well notice has been posted on the town's official lighted public meeting noticeboard, in the town hall foyer.

"We do not discriminate in recruitment, Personnel Actions, Leave Administration, Training, Tests, Medical Exams/Questionnaires, Social and Recreational Programs, Fringe Benefits, Collective Bargaining Agreements, and Wage and Salary Administration

"There are no social or recreational opportunities offered by the town of Warwick for its employees.

Kind regards,

x

Lawrence Pruyne, Selectboard Chair
978-544-6315
doc@town.warwick.ma.us



Town Of Warwick

Town of Warwick
12 Athol Road
Warwick, MA
01378

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January 13, 2021

Re: Town of Warwick open space plan

Melissa Cryan
Massachusetts Division of Conservation Services
100 Cambridge Street, 9th Floor
Boston, MA 02114

Dear Ms. Cryan:

I am town's ADA coordinator and the Town's chief operating officer. My contact information is contained below.

I certify that the Town of Warwick's employment practices are in compliance with the Americans for Disabilities Act.

Issues regarding recruitment, personnel action, leave administration, training, tests, medical exams, questionnaires, fringe benefits, wage and salary administration, and grievance procedures are covered under the town of Warwick personnel policy which was most recently updated in 2016.

This nondiscrimination position or policy is declared on the home page of the town's official website and as well notice has been posted on the town's official lighted public meeting noticeboard, in the town's official website.

There are no social or recreational opportunities offered by the town of Warwick for its employees.

Regards,

David Young
ADA Coordinator
978-729-3224 mobile
coordinator@town.warwick.ma.us

Warwick 2020 ADA Self-Evaluation

Lands under the Control of the Conservation Commission

Black Gum Swamp

This 8.6 acre remote, interior holding was acquired by the Warwick Open Space Committee through private fundraising efforts as a unique habitat containing threatened plant communities. While there are plans to make the site accessible by a loop trail off an existing trail on DCR state forest land (which it abuts) at some future date, it probably will not happen for some years. In 2017, the Town acquired the Victoria Shaw lot, expanding the Town Forest and connecting the Black Gum parcel with the existing Town Forest Reservation on Wendell Road.¹ The Open Space Committee is interested in creating trails on the Town Forest parcels to link these Town-owned open space resources. The Open Space Committee could also assess Town-owned open space parcels for the potential to create a handicap accessible trail.

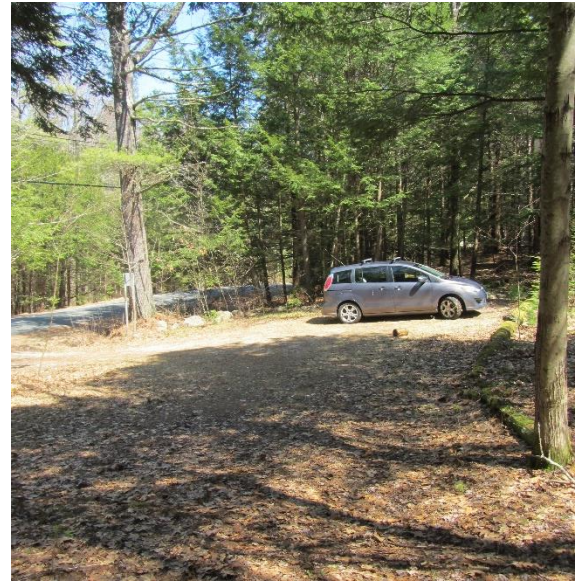
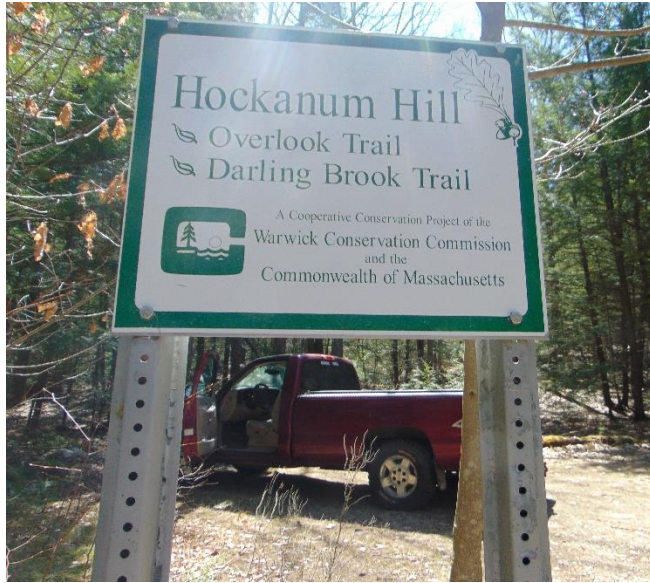
Black Gum Swamp
Facilities (list): None – not publicly accessible

Hockanum Hill Conservation Area

The 36 acre Hockanum Hill Conservation Area property was acquired in 2004 on Hockanum Hill to protect public access to the existing trail that leads to the “Overlook,” and also to protect a heavily used wildlife corridor along the ridgeline. This green corridor consists of mostly large permanently protected tracts of the Orange State Forest and the Warwick State Forest and runs for about 6 miles. Just off the edge of the road, a small log landing tucked in the woods at the base of a steep slope was converted to a parking area for 6 vehicles. There is a small sign indicating where the parking area is and another small sign indicating where the trail starts. The area is primitive, with only the trail and parking area. There are no picnic tables or trash barrels and the parking area is very muddy during the spring. The parking area is the only relatively flat land in the area. The trail is steep and starts at the edge of the parking area. The “overlook” has become overgrown with trees, and the Conservation Commission and Open Space Committee is considering the possibility of trimming this area to reopen the views. The Conservation Commission is also considering a loop trail on the parcel.

¹ The Victoria Shaw Lot is not under the control of the Conservation Commission.

Hockanum Hill Conservation Area
Facilities (list): Parking, hiking trail
Parking:
of spaces: Approximately 6
of handicapped spaces: 0
are handicapped spaces accessible to facilities: N/A
describe access from parking to facilities: The trailhead is accessed directly from the dirt parking area.
Site Access (describe path of travel): Access to the parking area is off of Hockanum Road, and is identified by a small sign.
Trails: Yes
Surface material: Natural
Dimensions: Approximately 10 feet wide
Rails: No
Signage (for visually impaired): No, signage is not accessible for the visually impaired



Hockanum Hill Conservation Area. Top Left: Entrance sign at the parking area. Top Right: Dirt parking area for approximately 6 vehicles. Bottom Left: "Trail" sign indicating the entrance to the trail. Bottom Right: View from the top of the hill.

Other Town Recreation Areas

Warwick Community School

The Warwick Community School has a pre-school playground, school-age playground, basketball court and soccer fields, which are open to public use when school is not in session. The pre-school playground, basketball court and playing fields are accessible from a paved driveway in front of the school. The school-age playground is located across the playing field, at the edge of the woods. There are no pathways leading from the paved driveway to the playground. The Town may consider adding marked accessible parking spaces adjacent to these recreation areas, and a paved or gravel path to the playground, to facilitate greater accessibility.

In addition to these recreation facilities, the school is surrounded by 25 acres of Town-owned land which include a kettle pond, a cranberry bog, and killdeer nesting in spring, among other natural features. The school site also has a garden, composting spaces, and a small hill used for sliding in the winter. An informal study group has been formed as a subcommittee to the Warwick Education Committee, to explore how to enhance access to the school land for the community and students.

Warwick Community School
Facilities (list): Parking, Playground, Basketball Court, Playing Fields
Parking:
of spaces: 45
of handicapped spaces: 2
are handicapped spaces accessible to facilities: No, they are accessible to the school building, not the recreational facilities.
describe access from parking to facilities: Parking is located to the north of the facilities, on the opposite side of the school driveway. There are no designated parking spaces located close to the entrance of the facilities.
Site Access (describe path of travel): Access to the recreation facilities is via the paved driveway.
Play Areas: Two playgrounds – pre-school and school age
is the same experience provided to all? The pre-school playground is adjacent to the school building and is accessible via a paved path from the driveway. The school-age playground is located across the playing field.
is it accessible? Access to the pre-school playground is accessible; the school-age playground is not.
notes:
Game Areas (ballfield, courts): Ballfield, Basketball Court
located adjacent to paths? The basketball court is located adjacent to a paved path. The playing fields are accessed from the driveway – there is no formal entrance to the field.

Warwick Community School
curb cuts onto courts? The basketball court is accessible from a paved path that travels from the school entrance and the driveway. The field is adjacent to the driveway, however there are not formal curb cuts providing accessible access to the field.



Warwick Community School. Top Left: View of the playground from the driveway. Top Right: Playground. Bottom: View from the athletic field of the driveway and basketball court.

Moores Pond Public Beach

Property on Moores Pond was purchased by the Town in 2010 to create a public beach and boat launch. The beach is licensed by the Warwick Board of Health, and regular water quality testing is conducted by the volunteer Moores Pond Beach Committee every two weeks in

compliance with State standards, Memorial Day through Labor Day. The beach has 2-4 informal parking spaces along South Holden Road. There are no designated parking areas. The beach may be accessed immediately off of South Holden Road. Two picnic tables are provided in an area level with the road. A sandy path leads down to the beach and water. A removable slatted boardwalk could be considered to provide accessibility improvements from South Holden Road to the water. However, it is not clear if there is enough space to designate a formal handicap accessible parking space along the road. More investigation is needed to understand the feasibility of this option.

Moore's Pond Public Beach
Facilities (list): Picnic Tables, Swimming Beach
Parking: No formal parking area
of spaces: approximately 2-4 spaces along road
of handicapped spaces: 0
are handicapped spaces accessible to facilities: N/A
describe access from parking to facilities: Access is directly off of the road. A line of wooden posts delineate the edge of the beach area from roadside parking.
Site Access (describe path of travel): Access is via South Holden Road. Walk past wooden posts to the beach.
Seating/Bleachers: Yes
what type and is it accessible? 2 picnic tables. They are level with the roadside parking, and are located on a sand and grass surface, but are not accessed via a pathway. The ends of each table are open, which could accommodate a walker or wheelchair.
picnic tables? Yes
Swimming Facilities: Yes
Location from accessible path into water: No
Handrails: No
Location from accessible parking: No
Shade provided: Yes, pine trees shade a portion of the picnic area.



Moores Pond Public Beach. Top Left: View of the beach from the edge of the parking area along South Holden Road. Top Right: Two picnic tables are located above the beach, level with the road. Bottom Left: View of the picnic tables and parking from the beach. Bottom Right: View of the sandy path to the beach from the picnic tables.

Warwick ADA Transition Plan

Black Gum Swamp			
Physical Obstacles	Type of Action to be Taken	Date to be Completed*	Responsible Party
No public access.	Develop a loop trail to access the site. Consider handicap accessible trail options.	2027	Conservation Commission, Open Space Committee

Hockanum Hill Conservation Area			
Physical Obstacles	Type of Action to be Taken	Date to be Completed	Responsible Party
No marked handicapped-accessible parking space.	Explore the feasibility of designating 1 space as handicapped accessible. It should be the closest space to the trail entrance and marked with a sign.	2027	Conservation Commission, Open Space Committee
Lack of trail information.	Add a kiosk with trail map and signage at the trailhead.	2025	Conservation Commission, Open Space Committee

Warwick Community School			
Physical Obstacles	Type of Action to be Taken	Date to be Completed	Responsible Party
Handicapped-accessible parking spaces are not close to the facilities.	Explore the feasibility of designating 1 - 2 handicapped accessible parking spaces adjacent to the field and basketball court.	2025	School Committee, Town Land Study Group
There are no paths from the parking area to the field and school-age playground.	Install an accessible path to each of these facilities from the parking area.	2025	School Committee, Town Land Study Group
Limited access to surrounding school land.	Incorporate accessible features when planning access to the school land, such as a handicap accessible trail.	2027	School Committee, Town Land Study Group

Moores Pond Public Beach			
Physical Obstacles	Type of Action to be Taken	Date to be Completed	Responsible Party
No marked handicapped-accessible parking space	Explore feasibility of designating 1 space as handicapped accessible. It should be the closest space to the beach entrance and marked with a sign.	2027	Select Board, Moores Pond Beach Committee
There are no paths from the road to park facilities, including: picnic tables and beach	Install an accessible path to one of the picnic tables; provide an accessible path to the beach and water during swimming season.	2027	Select Board, Moores Pond Beach Committee