dcr
Massachusetts

Resource Management Plan
Townsend State Forest

Adopted by the DCR Stewardship Council Month, 2025

Massachusetts Department of Conservation and Recreation
Division of Conservation and Resource Stewardship
Office of Cultural Resources

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Purpose

Resource Management Plans (RMPs) are foundational documents that identify a park, forest, or reservation's defining natural, cultural, and recreational resources and identify potential threats and opportunities to guide DCR's continued stewardship of the property and to inform future decisions about the property in a way that celebrates and preserves its identity.

RMPs are prepared for "all reservations, parks, and forests under the management of the department" (M.G.L. c. 21, § 2F). These plans "shall include guidelines for the operation and land stewardship of the aforementioned reservations, parks and forests, shall provide for the protection and stewardship of natural and cultural resources and shall ensure consistency between recreation, resource protection, and sustainable forest management." DCR finalizes RMPs following a public process and adoption by the DCR Stewardship Council. The contents of this RMP represent the best available information at the time of adoption by the Stewardship Council.

Mission and Core Principles

The Massachusetts Department of Conservation and Recreation, an agency of the Executive Office of Energy and Environmental Affairs, oversees 450,000 acres of parks and forests, beaches, bike trails, watersheds, dams, parkways, and over 100 National Register listed properties. The agency's mission is to protect, promote, and enhance our common wealth of natural, cultural, and recreational resources for the well-being of all.

DCR strives to be an exemplary leader in conservation and recreation. DCR's staff is passionate, dedicated, and continuously employs best practices, expertise, and a sense of place in carrying out the mission. The following core principles ground the agency in its work. For the benefit and well-being of all—people and the environment—DCR pledges to:

- Provide access to a diversity of outdoor recreational experiences and unique landscapes that is equitable, inclusive, and welcoming.
- Conserve lands, water, and forests by integrating science, research, and technical expertise into the management of our natural resources.
- Advance climate change mitigation and adaptation efforts by implementing sustainable practices and advancing resiliency across our infrastructure, assets, and resources.
- Support healthy communities by providing places for people to connect with nature and each other.
- Inspire generations of stewards by recognizing and honoring our legacy through partnerships, public engagement, and education.

Stewardship

DCR honors Indigenous peoples for their care, throughout many generations, of the land that DCR now stewards on behalf of the people of the Commonwealth. DCR embraces this legacy of stewardship, fostering a sense of shared responsibility by all people for protection of the waters, lands and living things for the enjoyment and appreciation of all.

To learn more about the DCR, its facilities, and programs please visit us at www.mass.gov/dcr. Contact us at mass.parks@mass.gov.

Townsend State Forest

1. Property Overview

Characteristic	Value
Date Established	1934
Location	Townsend
Ecoregion	Southern NE Coastal Plains; Worcester Plateau
Watershed	Nashua
DCR Region	Central
DCR District	Central Highlands
DCR Complex	Otter River
Management Forestry District	Northeast
Fire Control District	North Middlesex
Size (acres)	3,163.4
Boundary Length (miles)	29.2
Elevation - Minimum (feet)	283.4
Elevation - Maximum (feet)	742.8
Environmental Justice (acres)	69.7
Estimated Annual Attendance (2023)	12,000
Interpretive Programs (# programs, 2023)	0
Interpretive Programs (# attendees, 2023)	0

2. Landscape Designations

Designation	Acres
Parkland	0.0
Reserve	0.0
Woodland	2,963.4
No Designation	199.9

3. Regulatory Designations

Designation	Acres
Area of Critical Environmental Concern – Squannassit	3,163.4
Outstanding Resource Waters – Nissitissit River and Squannacook River	3,163.4
Priority Habitat (MESA)	195.4
Squannacook and Nissitissit Rivers Sanctuary (M.G.L. c. 132A, § 17)	Unk.

4. Long-Term Agreements

Agreement	Expiration Year
None Identified	N/A

5. Concessions

Concession Type
None

6. Partners & Friends

Group(s)
None

7. Features of Interest

Feature
Cellar Holes
Dead Swamp
Scenic views of Squannacook River and hills
Squannacook River
Trail System

8. Natural Resources

Resource	Value
Tree Canopy (acres)	3,084.1
Rivers and Streams (miles)	15.9
Open Water (acres)	8.6
Wetlands (acres)	166.2
Certified Vernal Pools (#)	6
Potential Vernal Pools (#)	10
State-Listed Species (# Regulatory)	5
State-Listed Species (# Non-Regulatory)	0
Federally Listed Species (#)	0
Aquatic Invasive Plants (# known species)	0
Terrestrial Invasive Plants (# known species)	6

9. Forest Management (Since 2012)

Management Objective	Acres
Reduce the impact of biological stressors	358.0
Reduce the risk and long-term impacts of severe disturbances	66.0
Maintain or create refugia	29.0

10. History of Wildfires and Conditions Influencing Future Wildfires

Wildfire Attribute	Value or Characteristic
Number of wildfires on property; 2019–2023	0
Acres burned by wildfires on property; 2019–2023	0.0
Number of wildfires in Fire Control District; 2019–2023	253
Acres burned by wildfires in Fire Control District; 2019–2023	250.0
Type of Wildland-Urban Interface	Intermix
Predicted rate of spread, based on Fire Behavior Fuel Model 13	Moderate

11. Natural Hazards

Hazard Type	Acres
Flood (1.0%-chance)	24.5
Flood (0.2%-chance)	131.2
Hurricane Inundation (Cat. 1)	N/A
Hurricane Inundation (Cat. 4)	N/A

12. Climate Change (By 2070)

Type of Change	Amount of Change
Increase in annual days over 90° F	>30
Change in annual maximum daily rainfall (inches)	>10
Massachusetts Coastal Flood Risk Model area of inundation (acres)	N/A

13. Cultural Resources

Resource Type	#
Archaeological	0
Historic - Total MACRIS Listed	0
Historic - National Register Listed	0
Historic - National Historic Landmark	0

14. Recreation Resources

Resource	#
Trail Network	1

15. Recreation Activities

Activity
Bicycling, mountain
Canoeing/Kayaking
Dog sledding
Dog walking, on-leash
Hiking/Walking
Horseback riding
Nature study/Photography
Orienteering
Picnicking
Running/Jogging
Skiing, cross-country
Snowmobiling
Wildlife viewing

16. Roads and Trails

Metric	Value
Roads - Unpaved (miles)	1.4
Roads - Paved (miles)	0.2
Forest Roads - Unpaved (miles)	22.6
Forest Roads - Paved (miles)	0.0
Trails - Unpaved (miles)	4.6
Trails - Paved (miles)	0.0
Trails - Unauthorized (miles)	1.5
Trail Density (miles/acre)	0.009
Area of Impact (acres)	1,725.6

17. Parking

Parking Resources	#
Lots	3
Parking Spaces - Total	19
Parking Spaces - Accessible (HP)	0
Parking Spaces - Other	19

INTRODUCTION

Townsend State Forest (Townsend or the Forest) is in the Town of Townsend (the Town), approximately 8 miles north-northeast of Fitchburg and adjacent to the Massachusetts-New Hampshire state line. Willard Brook State Forest and Squannacook Brook State Forest are each approximately 1 mile southwest and southeast from the Forest, respectively. Townsend is a former agricultural and light industrial community transitioning into a bedroom community within the greater Boston metropolitan area. The Town and the Forest lie at the transition between the Southern New England Coastal Plain and Worcester Plateau Ecoregions. The Forest's multiple, contiguous tracts are bounded and transected by numerous state and local roads. Noteworthy peripheral roads are Route 13 to the east, Dudley and Turnpike roads to the south, and Mason Road to the west. The north boundary is coterminous with the state line and has no street frontage. Barker Mill Road transects the Forest on a north-south axis. Neighboring properties are primarily residential; consisting of a diverse mixture of historical farms, suburban homes and subdivisions, and a few multi-unit dwellings.

The Forest protects approximately 0.75 miles of Squannacook River frontage. The Squannacook River is a 16.4-mile-long tributary of the Nashua River that is (with some exceptions) a designated Wild and Scenic River (see additional discussion below). In addition to Townsend State Forest, Squannacook Brook State Forest also protects portions of this resource-rich river.

The Forest is on land shaped by generations of Indigenous and non-Indigenous inhabitants. Past and present Indigenous residents embody fluid, relational connections to the places and spaces now known as Townsend State Forest. Groups and individuals, including Indigenous peoples known as the N'dakina, Wabanaki (Dawnland Confederacy), Pennacook, Nipmuc, and Agawam, are recorded in available documentation (Native Land Digital 2023) as having relationships to this place over seasons and generations. During the ancient period (12,000–450 years before present), the Squannacook River and nearby ponds around the Forest are presumed to have been used on a short-term basis by Indigenous peoples traveling north (upriver) from larger camps along the Nashua River, as the area's status as territorial borderland precluded long-term settlement (Massachusetts Historical Commission 1984: 2). Following Indigenous peoples' dispossession, lands that would become Townsend were granted to settlers in 1719, with incorporation occurring in 1732. Townsend State Forest was established in 1934 with the purchase of approximately 1,900 acres. The acquisition, made under authority of the State Forest Act (M.G.L. Chapter 132), was funded through an accelerated Great Depression-era conservation effort driven by "the necessity for providing additional acreage for the economic employment of the Civilian Conservation Corps [CCC]…." (Massachusetts Department of Conservation 1935: 2–3). Lands acquired by the Commonwealth had been cut over by local manufacturers and had subsequently burned in an extensive 1927 wildfire. The CCC workers planted thousands of trees; constructed roads, water holes and fire breaks; and created a fenced wildlife management area (no longer extant) (Berg 1999: 49–50). The Forest had expanded to approximately 2,714 acres in 1936. Beginning in the 1960s and extending until 2017, there have been multiple small acquisitions that have brought the Forest's acreage to its current total of just over 3,100.

The Forest occupies primarily south-facing upland slopes (including summits of Barker and West hills) along the north side of the Squannacook River drainage, with a few tracts bordering the Squannacook River (see Land Stewardship Zoning Map on page 25). Townsend is almost entirely covered with a mixed hardwood-white pine forest with a scattering of pine plantations. Understory species such as mountain

laurel and blueberry (low- and high-bush) add interest in the spring and summer. Numerous marshes, swamps, bogs, and vernal pools are created by the undulating topography and underlying bedrock, combined with multiple perennial streams. Cellar holes, wells, stone walls, and old roads provide evidence of historical land occupancy along old Town roads in the Forest. The Massachusetts Division of Fisheries and Wildlife (MassWildlife) owns and manages the Fessenden Hill Wildlife Management Area (WMA) as an approximately 38-acre inholding (acreage based on current DCR GIS data; MassWildlife lists this site as 21 acres) on the north side of the Forest. Townsend rewards visitors with outstanding opportunities for passive recreation and hunting along its many forest roads and trails. Visitors may enjoy a diverse range of natural communities, plants, and animals and contemplate the cultural history of this Forest as they walk, bicycle, ski, and snowshoe through the property, or paddle along the Squannacook River.

PARK IDENTITY

Townsend State Forest is a Woodland that affords diverse recreational activities, as well as forest management opportunities, to residents of Middlesex and Worcester Counties and southern New Hampshire while protecting portions of the scenic Squannacook River and its watershed. Resources that characterize the Forest's identity consist of the wooded uplands, trail network, and the Squannacook River. All future activities and improvements should ensure continued stewardship of upland and riparian resources and habitat, as well as known and potential cultural resources, while maintaining opportunities for passive trail recreation and responsible silviculture.

DEFINING RESOURCES AND VALUES

Resources and values that define the Forest are related to its combination of upland and riparian locations with extensive forest stands and its long history of human occupancy. They include:

- A forested landscape supporting diverse natural communities, habitats, and species, including:
  - Priority Habitat for five species that are protected under the Massachusetts Endangered Species Act (MESA): two invertebrates (Species of Special Concern) and three reptiles (two Species of Special Concern, one Threatened).
- Mixed hardwood and white pine-hardwood stands that demonstrate current and historical silviculture practices, provide wildlife habitat, and create a setting for recreation.
- Access to and protection of the Squannacook River and multiple unnamed tributaries that run through the Forest. The river supports important recreational, scenic, cultural, and natural resource values that are recognized and safeguarded through multiple state and federal legislative designation or programs, including:
  - Designation as a Scenic River under the U.S. Wild & Scenic Rivers Act (Public Law 90-542; 16 U.S.C. 1274(a), 1968), as amended by Public Law 111-9, §1303 (March 12, 2019). (The River is managed under the Nashua River Wild and Scenic River Study Committee's Nashua, Squannacook, and Nissitissit Rivers Stewardship Plan (2018)).
  - Designation as Outstanding Resource Waters (314 CMR 4.06).
  - Protection within the Squannacook and Nissitissit Rivers Sanctuary (M.G.L. c. 132A, § 17) created in 1975 (Massachusetts General Court 1975).

  - Identification as a Coldwater Fish Resource (Massachusetts Bureau of Geographic Information (MassGIS) 2021).
- Contributions to landscape-scale protection efforts. In addition to protecting the values of the Squannacook River corridor as previously described, the Forest is the largest conserved property within and makes significant contributions to the multiple environmental values of the Squanassit Area of Critical Environmental Concern (ACEC) (Secretary of Environmental Affairs 2002). The over 37,000-acre Squanassit ACEC extends from Lunenberg and Shirley north to the New Hampshire border and protects wildlife and endangered species habitat, wetlands and waterbodies, drinking water resources, and scenic, cultural, and agricultural landscapes and resources.
- Archaeological sites and cultural landscape features associated with Townsend community and CCC history. Cellar holes and stone walls illustrate pre-Forest land use history. Remains of two CCC camps are evidence of the state-wide work undertaken during the Great Depression to improve forests and to provide employment and training for the Commonwealth's citizens.
- Recreation on the trail network and River. The Forest represents a significant regional open space resource: its acreage is approximately 37% of the 8,378 acres of protected open space in the Town and is 14% of the Town's total land area. The Forest contains over 27 miles of trails that provide diverse recreational opportunities.
- Equitable recreation access. The Forest provides recreational amenities to and enhances environmental quality and equity for an Environmental Justice (EJ) community next to the Forest.

STATEMENTS OF SIGNIFICANCE

Statements of Significance describe the importance or distinctiveness of a place and its resources (National Park Service 1998). These statements reflect current scholarly inquiry and interpretation and go beyond a simple listing of resources to include contextual information that makes the facts more meaningful. When developing significance statements, the following criteria are considered:

- The property's significance at the time of its establishment.
- How the property, or society's understanding of the property, has changed since its acquisition that makes it significant or unique within the state park system today.
- The property's role in recreation and its importance to the community it supports, particularly regarding activities that are unique to that property.

For park planning, these statements focus management actions on the preservation and enjoyment of those attributes that most directly contribute to the importance of the place. For interpretive planning, they comprise the information upon which the interpretive themes and overall program are built.

The following Statements of Significance have been identified for Townsend State Forest. The sequence of these statements does not reflect their level of significance.

- Beyond the original intents of timber harvesting, pest control, and fire control, DCR forest management objectives have evolved to include more ecosystem services such as carbon sequestration and storage, diverse wildlife habitats, forest resiliency, safety, and water quality.
- The area along the Squannacook River and its connected wetlands are designated as Priority Habitat (PH2035), indicating land that is known to be the geographic extent of habitat for state-listed species.

These species are either at risk or may become at risk, of extinction. This area extends into the Squannacook River WMA and other connected conservation areas.

- Although foresters recognized that forest management could enhance recreational activities, when they created the state forests, recreation was a secondary motivation. State forests were viewed as opportunities to provide a "wilder" recreational experience in contrast to "planned," more landscaped parks. Prior to 1933, only three forests offered recreational facilities. Over time the focus on recreation grew to the point where it is the most visible function of the agency.
- The Massachusetts State Forest system was founded on the principles of scientific forest management. These practices contrasted with ongoing un-managed destructive practices throughout the country. This effort focused on the long-term cultivation of forests to achieve a sustainable harvest. Foresters worked to maximize production and provide a sustained yield over time, aiming for long-term stewardship over short term profits. The State Forests were also meant to serve as a model for private landowners, who the state foresters assisted in this endeavor.
- While not a motivation in establishing the state forests, foresters at the time recognized the importance of trees to a watershed. The long-term impact of the reforestation of Massachusetts led to improved water quality in the Commonwealth.

UNIFYING THEME

The Unifying Theme is a statement that ties a property's stories together and shapes the overall interpretive message that DCR wants to share with visitors in their experience at the property. The theme provides an overarching conclusion for visitors to contemplate (Ham 2013) and answers the question "so what?" The theme guides all interpretation for the park, both personal (i.e., formal and informal interactions with visitors) and non-personal (e.g., exhibits, signage, brochures).

The Unifying Theme for Townsend State Forest is:

Forest management treats land as a community of interacting and independent parts.

VISITOR EXPERIENCE

Townsend State Forest provides a variety of visitor experiences, including the following:

- **Virtual Experience.** Potential visitors will find little information about Townsend on DCR's web site. The "Find a Park" tool (https://www.mass.gov/info-details/find-a-park) identifies the Forest's location and lists Hiking/Walking as activities that visitors may enjoy here.
- **Entering the Park.** Visitors may enter the Forest at multiple gated forest roads. The primary Forest entrance is located on Dudley Road and features a large gravel lot marked with a Main Identification Sign and featuring a small kiosk (see cover photo). Fessenden Hill Road has a smaller, well-maintained lot that is marked with a small trail map behind the forest road gate. A third popular entrance is located on Old Turnpike Road adjacent to a former railroad right-of-way (ROW). This dirt pull-off is unmarked. A fourth noteworthy entrance is an unmarked forest road and pull-off located on Brookline Road (Rt. 13).
- **Trail-based Passive Recreation.** Visitors may access a well-developed and extensive (over 26-mile-long) trails network that is appropriate for walking, running, biking, horseback riding, skiing, and snowshoeing. The trails and forest roads pass through scenic woodlands interspersed with views

from wetland shores and stony outcrops and offer opportunities for both short walks and longer excursions.

THREATS AND OPPORTUNITIES

The following information identifies potential threats to the park's natural and cultural resources and identifies opportunities to enhance their protection and stewardship. Although recreation is not considered a resource under statute (M.G.L. c. 21, § 2F), it is included below because recreation is an important part of the park-going experience, helps define a park's values, and is a key part of assessing the consistency of activities taking place in the Commonwealth's forests, parks, and reservations.

Threats and opportunities identified below are used to inform the development of management recommendations. Potential recommendations must meet prioritization criteria to be included in the Priority Recommendations table (Table 19, page 29).

Natural Resources

Threats

- The Town's most recent Open Space and Recreation Plan (expired 2020, not yet updated) seeks to generate town revenue by selling town-owned land (Town of Townsend 2013: 69). Sales of town-owned land, some of which abuts the Forest, may threaten forest connectivity and habitats.
- Undeveloped open space in New Hampshire that is adjacent to the Forest and within the watersheds of the Squannacook and Nissitissit Rivers is currently not protected. Development of this open space, some of which is designated as Highest Ranked Habitat in the State of New Hampshire's Wildlife Action Plan, would threaten water quality, habitats, and natural communities in the Forest (University of New Hampshire 2022).
- Two potential encroachments on the Forest may have occurred. Such encroachments may threaten natural communities or rare species habitat in the Forest:
    - Owners of a residence on Burgess Road may have conducted landscaping activities (now halted) on Forest land.
    - Owners of a property on North End Road may have cut approximately 1 acre of Forest trees between 2019 and 2021 (based on aerial photography).
- A former railroad ROW, now owned by the Commonwealth of Massachusetts, passes through, but is not managed as part of, the westerly edge of the Forest. This ROW may be developed as the Squannacook River Rail Trail (a hardened multi-use trail) under the direction of Squannacook Greenways, Inc. and could eventually connect to the completed Greenville-Mason Railroad Trail in New Hampshire (Massachusetts Department of Transportation 2024; Squannacook Greenways, Inc. 2022). Off-highway vehicles (OHVs) are permitted on rail trails in New Hampshire, but not in Massachusetts. Therefore, completion of the rail trail may exacerbate current unauthorized OHV use in the Forest and increase damage to the Forest's natural resources.
- Unauthorized OHV use in the Forest is causing erosion that may threaten the biological health of sensitive aquatic areas such as streams and ponds.
- Forest visitors have created several unauthorized trails, including the "Drop Trail" and "Rt. 13 Ridge Trail" for mountain biking (Adventure Projects Inc. 2022). Construction of trails without authorization

or applicable regulatory review may threaten MESA-protected species habitat, natural communities, and/or ecosystem functions.

- The Massachusetts Department of Environmental Protection (MassDEP) has identified several water quality impairments in the Squannacook River (Assessment Unit (AU) MA81-18) within Townsend State Forest (MassDEP 2023), resulting in this stretch of the river being classified as not suitable habitat for sustaining a native, naturally diverse community of aquatic flora and fauna (MassDEP 2021:163). Because MassDEP updates its Integrated List of Waters on a regular basis, readers are directed to refer to the most recent version of that document for current information.
- Townsend state forest is located in a watershed with a Total Maximum Daily Load (TMDL) report required to address water quality impairments (per MassDEP 303d list) to Squannacook Brook (AU MA81-18). Although the waterbody is listed as requiring a TMDL (Category 5 of the 303d list), a TMDL has not yet been developed.
- The following six invasive species have been identified in the Forest: glossy buckthorn, Japanese barberry, Japanese knotweed, multiflora rose, non-native shrub honeysuckle, and Oriental bittersweet (BSC Group 2017: 29, 31). Invasive species may negatively impact both the ecological integrity and biodiversity of the Forest.
- There are multiple unapproved geocaches in the Forest, some of which are located away from trails. Inappropriately located geocaches may threaten sensitive natural resources.
- Various tree species in the forest may be threatened by outbreaks of spongy moth, emerald ash borer, red pine scale, Caliciopsis canker, and white pine needle disease.
- Exclusion of fire from the landscape has led to a buildup of fuel loads, increasing the likelihood and potential hazard of wildfire. Fire exclusion has also resulted in the mesophication of historically fire-influenced natural communities (oak woodlands and some barrens) (Leddick 2024).
- Recreationists occasionally build unauthorized campfires. This behavior threatens forest health and public safety through the possibility of uncontrolled wildfires.

Opportunities

- There may be opportunities to partner with conservation entities in the New Hampshire to preserve large tracts of open space north of Forest.
- The Town's most recent Open Space and Recreation Plan (expired 2020, not yet updated) seeks to generate town revenue by selling town-owned land. Where appropriate to DCR conservation objectives, purchase of town-owned land may be an opportunity to further the Commonwealth's and DCR's conservation goals.
- Approximately 199.9 acres of the Forest has no Landscape Designation (DCR 2012). Assigning Landscape Designations to these portions of the Forest could help with management of associated natural resources and ensure management consistent with DCR properties statewide.
- There is an opportunity to protect Forest boundaries from future encroachment by continuing to monitor residential properties such as those on Burgess Road for expansion into the Forest.
- There is an opportunity to improve forest health, particularly near aquatic ecosystems, by improving trail maintenance through increased staffing, volunteer work, and availability of trail maintenance supplies.

- Some of the Forest's 10 potential vernal pools may "support rich communities of vertebrates and invertebrates" (MassWildlife 2009) and serve as important habitat components for other wildlife. Surveying and certifying these pools (DCR (n.d.a) and MassWildlife (2009)), as appropriate, may help better protect these animals.
- There are opportunities to protect streams and other wetland habitat by installing walkways and/or bridges, or rerouting trails, at currently unimproved trail crossing locations.
- There are two dams in the Forest in the vicinity of the main parking lot on Dudley Road. An opportunity exists to determine the historical origins of these structures and their positive or negative effects on wetland habitat or community functions.
- There is an opportunity to protect the multiple conservation and recreation values recognized through the various designations (National Scenic River, Outstanding Resources Water, Coldwater Fish Resource, Natural Heritage and Endangered Species Program (NHESP) Priority Habitat of Rare Species, component of the Squannassit ACEC) afforded the Squannacook River through design of forest management projects to maximize ecosystem services.
- There is Priority Habitat for multiple state-listed species (three invertebrates, two reptiles, one mammal) in the Forest that depend on healthy streams and wetlands, along with adjacent wooded upland areas. There is an opportunity for ongoing protection of these habitats through continued application of Best Management Practices (BMPs) for forestry and trail maintenance.
- There is an opportunity to improve ecosystem functions and improve public safety through prescribed burns. Conducting such burns could also provide an opportunity to restore a large block of oak woodlands in the Commonwealth and to enhance biodiversity in the Forest (Leddick 2024).
- Clearing and improving fire breaks would facilitate any management efforts relating to prescribed burns, as well as generally enhance any future forest fire management efforts.
- One state-listed reptile with Priority Habitat in the Forest benefits from edge habitat in mosaics of pitch pine-scrub oak communities that are in various stages of succession. There may be opportunities to protect this species population through forest management projects that create such habitat.
- There is an opportunity to protect the Priority Habitat of MESA-listed reptile species in the Forest through expanded efforts to prevent OHV use in the Forest, particularly during nesting season.

Cultural Resources

Threats

- Construction and use of unauthorized trails may disturb areas of the Forest that have potential archaeological resources.
- Erosion from natural weather events, river flooding, and human recreational activities may threaten archaeological resources in the Forest.
- There are multiple unapproved geocaches in the Forest, some of which are located away from trails. Inappropriately located geocaches may threaten sensitive archaeological resources.
- One identified cellar hole and two dams are within the Federal Emergency Management Agency's (FEMA) 0.2%-chance flood zone and therefore may be threatened during severe flood events (MassGIS 2023).

- Some cellar holes are close to forest roads, which contributes to inappropriate digging and/or metal detecting by visitors.
- Unauthorized OHV use occurs in close proximity to, or possibly within, the archaeological remains of CCC Camp S-82, which has not been archaeologically surveyed. OHV use may threaten archaeological resources associated with this poorly defined archaeological site.
- As described in the Natural Resources Threats, two incidences of potential encroachment have occurred in the Forest. Encroachments may damage sensitive cultural resources.

Opportunities

- There is an opportunity to improve DCR's knowledge and management of cultural resources in the Forest through an archaeological reconnaissance survey in cooperation with municipal, tribal, and regional partners.
- Approximately 199.9 acres of the Forest has no Landscape Designation (DCR 2012). Assigning Landscape Designations to these portions of the Forest could help with management of associated cultural resources and ensure management consistent with DCR properties statewide.
- The presence of numerous cellar holes, stone walls, and historic roads in the Forest provides an opportunity to research, document, and interpret the history of the land prior to Commonwealth ownership.
- There is an opportunity to protect cellar holes in the Forest by implementing DCR's BMPs for Archaeological Features (DCR n.d.b). In particular, cutting of vegetation and efforts to monitor and/or prevent metal detecting and digging could help to protect the integrity of archaeological sites in the Forest.
- The remains of two CCC camps, Camp S-82 (active 1935–1940) and Camp S-88 (active 1935) are present in the forest. There is an opportunity to protect the camps' site features through the implementation of DCR BMPs and thereby protect the archaeological site data for future generations.
- There are two small dams in the Forest in the vicinity of the main parking lot on Dudley Road. An opportunity exists to determine the historical origins of these structures to ensure their appropriate long-term management as cultural resources.
- All public roads bordering the Forest, excepting Brookline Road (Rt. 13), are designated Scenic Roads under Townsend General Bylaws, Chapter 106 (Town of Townsend n.d.; authorized under M.G.L. c. 40, § 15C). DCR's preservation of forest edges (i.e. buffer strips) and stone walls maintains the scenic character of these public ways.
- Stone features have been identified in the Forest; their origins and cultural significance remain undetermined. Assessing, inventorying, and preserving these resources are a high priority for DCR.

Recreation

Threats

- There is limited official information available on Townsend State Forest. DCR's webpage does not include information on the Forest and there is no official trail map, making it difficult for potential visitors to become aware of the property and its recreational opportunities.

- Heavy visitation to the Forest, as well as unauthorized OHV use, damages trails and fire roads, threatening access and the quality of the trails experience for all visitors.
- A former railroad ROW, now owned by the Commonwealth of Massachusetts, passes through, but is not managed as part of, the westerly edge of the Forest. This ROW may be developed as the Squannacook River Rail Trail (a hardened multi-use trail) under the direction of Squannacook Greenways, Inc. and could eventually connect to the completed Greenville-Mason Railroad Trail in New Hampshirehttp://squannacookgreenways.org/. OHVs are permitted on New Hampshire Rail Trails, and, at present, the Massachusetts ROW is used by OHV riders. Therefore, completion of the rail trail in Townsend may exacerbate unauthorized OHV use of the Forest and threaten the passive recreational experience of Forest visitors.
- There are approximately 1,300 feet of roads and trails infrastructure in the Forest that are within FEMA's 0.02%-chance flood zone and therefore may be threatened during severe flood events (MassGIS 2023).
- Several trail segments lead from the Forest onto private property. Of note is one popular segment (as reported on social media) that exits the Forest to access a scenic vista and historical quarry on private property. Trail users may not know that they are crossing onto private property and may be exposed to hazards not typically encountered in DCR trail systems.
- The Dudley Street parking lot is sometimes used as a "hang out" location, which can lead to depreciative behaviors and may be off-putting to other Forest visitors.
- An uncapped historical well within an archaeological site is immediately adjacent to Fessenden Hill Road, posing a potential safety hazard to Forest visitors.
- A metal culvert has partially collapsed on a forest road that parallels Old Turnpike Road in the southwest corner of the Forest. The void created by this collapse may pose a risk to recreational users. This culvert may have been constructed by the CCC as part of Camp S-82.
- As described in the Natural Resources Threats, two incidences of potential encroachment have occurred in the Forest. Encroachments may limit recreationist's use and enjoyment of the Forest.

Opportunities

- Adding information on Townsend State Forest to DCR's web page would allow potential visitors to become aware of the Forest, its resources, and associated recreation opportunities.
- Portions of the Forest and its Squannacook River frontage are within and contiguous with an EJ tract. There may be opportunities to advance environmental justice and equity via DCR's Environmental Justice Strategy (see pages 79–88 in Massachusetts Executive Office of Energy and Environmental Affairs (EEA) 2024), in alignment with the EEA's EJ Policy (EEA 2021) and the Executive Order on Environmental Justice (No. 552) (Patrick 2014).
- A former railroad ROW, now owned by the Commonwealth of Massachusetts, passes through, but is not managed as part of, the westerly edge of the Forest. Other portions of this ROW may be developed as the Squannacook River Rail Trail under the direction of Squannacook Greenways, Inc. and could eventually connect to the Greenville-Mason Railroad Trail in New Hampshire. Completion of this rail trail is an opportunity to provide recreationists with another means of access to the Forest, and to allow Forest visitors to connect to conserved lands in both states (including the nearby Squannacook Brook State Forest.)

- There are currently no accessible trails in the Forest. During future trails improvements, there may be opportunities to identify opportunities for and construct accessible trails.
- There are opportunities to improve the visitor experience by installing walkways and/or bridges at currently unimproved stream and wetland crossing locations.
- There is an opportunity to create longer loop trails through the Forest by extending and connecting existing trails that that approach, but do not cross, Barker Hill Road.
- There is an opportunity to prevent erosion and increase the quality of trails by applying trail maintenance BMPs and increasing staffing for this work.
- Visitor experience of and orientation to the Forest may be improved by making changes to the main gateway at the Dudley Road parking area:
  - Add a Welcome Wayside panel to the kiosk.
  - Lower the height of the kiosk.
  - Relocate the Forest's Main identification Sign from its current inconspicuous location to the street frontage or place lead-in signs on the street frontage.
  - Replace the forest road gate, which is assembled from cable and steel drums, with a standard DCR gate.
- Visitors' experience of and orientation to the Forest may be improved by making improvements to the existing secondary gateways at the Fessenden Road and Old Turnpike Road:
  - Erect cantilevered identification signs.
  - Install Rules and Regulations signs.
  - Increase parking capacity and grade the surface of the Old Turnpike Road parking area.
- If Forest visitation increases in the future, there may be an opportunity to improve and expand access to the eastern portion of the Forest by creating a secondary gateway with a Cantilevered Identification Sign, parking area lot, and Rules and Regulation notice) at an existing trailhead on Brookline Road (Rt. 13).
- Some unauthorized OHV users enter the Forest from undeveloped parcels in New Hampshire. There are opportunities to limit OHV access to the Forest by posting these entrances with Rules and Regulations notices and erecting gates or other obstructions. Working with New Hampshire land protection groups to place these parcels into conservation could also help to restrict OHV use.
- Townsend is located within the Freedom's Way National Heritage Area, offering opportunities for agency partnerships, grants, and potentially higher visibility for the Forest (Freedom's Way Heritage Association 2015).
- As historical and archaeological knowledge of the Forest increases, there may be opportunities to interpret the historical connections between archaeological sites in the Forest, Townsend's history of cooperage (barrel manufacture), the wildfire of 1927, CCC work, and forest health.

CLIMATE CHANGE

Climate change impacts nearly every aspect of DCR's properties, from ecosystem health, to infrastructure, to recreation. (See DCR 2024 for an overview of these impacts.) The Department is actively working to mitigate and adapt to current and future impacts through such actions as forest

management; decarbonizing DCR's buildings, vehicles, and power equipment; protecting wetlands; and using nature-based solutions to minimize stormwater impacts. Information on these, and other, efforts is incorporated into RMPs as available and appropriate.

Any discussion of climate change requires a shared understanding of terminology. Because of this, this RMP section adopts commonly accepted terms to the greatest extent possible. In general, climate-related technical terms used in this RMP are as defined in the Sixth Assessment Report of the Intergovernmental Panel on Climate Change (IPCC 2021). Exceptions to this are the terms Adaptation, Risk, and Sensitivity, which are used as defined in DCR's Climate Change Vulnerability Assessment (CCVA; Weston and Sampson 2022).

DCR manages its forests to provide a range of ecosystem services such as recreation, clean water, wood commodities, and wildlife habitat (DCR 2020). For ecosystems under its management, DCR carefully considers both their vulnerability to climate change and their ability to mitigate the effects of climate change by storing carbon in ecosystems and harvested wood products. Several approaches are used to monitor DCR forests and to design forest management strategies to adapt to climate change and provide ecosystem services. (See Swanston et al. (2016) for information on adaptation strategies and approaches associated with DCR's forest management.) Established in 1957, DCR's Continuous Forest Inventory (CFI) system uses a network of more than 2,000 permanent plots on which repeated measurements are taken on an ongoing basis. The CFI measures the status, size, and health of over 100,000 trees; other vegetation; down woody material; and the forest floor. (See DCR 2022 for additional information on the CFI system.) This information helps DCR understand at a strategic scale the current character, condition, and trends of forest ecosystems under its care. DCR also uses operational inventory to help plan specific treatments and evaluate their outcomes. Using these different scales of information, remotely sensed data, and local and regional external expertise, DCR plans projects that help its stands, forests, and other lands adapt to climate change and mitigate greenhouse gas emissions. The conservation and science-based management of forest lands are an essential element to ensuring crucial carbon storage and advancing climate change resilience (EEA 2024). For additional information on the relationship between DCR's forest management practices and climate change, please see pages 77–85 in Massachusetts Forest Action Plan 2020 (DCR 2020) and Managing Our Forests…For Carbon Benefits (DCR 2023).

The Department is actively assessing and addressing the vulnerability of its properties and facilities to the impacts of climate change. In 2022, DCR conducted a CCVA (Weston and Sampson 2022). Findings from this CCVA are being used by DCR to enhance park operations and maintenance, inform resilient investment, and provide a framework for hazard mitigation and climate adaptation for natural resources, cultural resources, recreational activities, buildings, facilities, and other infrastructure. Property-specific climate change information from the CCVA is included in the Climate Change (by 2070) table (Table 12) at the beginning of this RMP. An overview of the impacts of climate change on DCR facilities and operations is presented in the DCR Climate Impacts Story Map (DCR 2024).

Climate Exposure and Impacts

A summary of the ways in which the Commonwealth's natural, cultural, and recreational resources may be impacted by climate change is provided below. During the preparation of RMPs some resources may be identified as having particularly high exposure and/or sensitivity to the anticipated hazards or consequences of climate change. When this occurs, these resources and the projected impacts to them

are described. In some instances, the potential impacts of climate change on a given resource are not well understood. When this occurs, only exposure is discussed.

Natural Resources—General Impacts

Climate change affects temperature, precipitation, and atmospheric and ocean chemistry, which in turn directly and indirectly affect the natural environment, including the plants, animals, and natural communities of DCR's forests, parks, and reservations.

Climate is known to influence the presence, absence, distribution, reproductive success, and survival of both native and non-native plants (Finch et al. 2021). Native northern and boreal species, including balsam fir, red spruce, and black spruce may fare worse under future conditions, but other species may benefit from the projected changes in climate (Janowiak et al. 2018). Some non-native invasive species will be affected by climate change while others will remain unaffected, and some non-invasive non-native species are likely to become invasive (Finch et al. 2021). In general, elevated temperature and CO_2 enrichment associated with climate change increases the performance of non-native plants more strongly than the performance of native plants (Liu et al. 2017). Climate change may result in the presence of new non-native invasive plants on a property, and changes to the distribution and/or abundance of invasives already present on a property.

Exposure to a changing climate affects wildlife in a variety of ways. For animals that live in or near aquatic environments, "changes in habitat and hydrological regimes are expected to shift their abundance and distribution" (Isaak et al. 2018: 89). Impacts to terrestrial animals are expected to be highly variable (Halofsky et al. 2018) but may be considered to fall into the following four categories: 1. habitat loss and fragmentation; 2. physiological sensitivities (i.e., innate characteristics that influence the ability to cope with changing temperature and precipitation conditions); 3. alterations in the timing of species' life cycles; and 4. indirect effects (e.g., disruption of ecological relationships) (Friggens et al. 2018). Although all Northeast wildlife are exposed to hazards associated with climate change, some groups, "including montane birds, salamanders, cold-adapted fish, and freshwater mussels, could be particularly affected by changing temperatures, precipitation, sea and lake level, and ocean processes" (MassWildlife 2015: 357). In addition, it is the position of the NHESP that state-listed species and Priority Natural Communities are likely to be highly sensitive to climate change and that all state-listed species will be negatively affected by hydrologic changes, changes in water, soil, and air temperature, and changes in forest composition.

Natural Resources—Property-Specific Exposure and Impacts

The entire length of the Squannacook River within the Forest has been identified as a Coldwater Fisheries Resource by MassWildlife. Such streams provide important habitat for coldwater species, which are typically more sensitive than other species to alterations in stream flow, water quality, and temperature (MassGIS 2021).

Climate change may cause some vernal pools to dry earlier in the season than they have historically, potentially interfering with amphibian life cycles (Cartwright et al. 2022). Because of this, some of the Forest's pools and associated wildlife may be negatively impacted. Similar impacts may occur at potential vernal pools that function as vernal pools.

Habitat exists in the Forest for two species that have been identified as being particularly sensitive to climate change: the Eastern newt and an invertebrate Species of Special Concern that inhabits aquatic habitat.

Responses of Massachusetts' invasive plants (i.e., those categorized as Invasive by the Massachusetts Invasive Plant Advisory Group (MIPAG) (n.d.)) to a changing climate are largely unknown. However, sufficient information exists to project the likely future trend of Japanese barberry and Oriental bittersweet. Climate change facilitates invasion by Japanese barberry "because of higher growth and germination in warmer climates" (Merow et al. 2017: E3276). Because of this, it is anticipated that barberry will further spread at Townsend State Forest. "Available data suggest that bittersweet is likely to benefit from the warming and increased precipitation that are predicted for the Northeast" (Rustad et al. 2012), resulting in expansion throughout New England. Areas where the forest canopy or forest floor has been disturbed are particularly susceptible (McNab and Loftis 2002). Because of this, it is anticipated that Oriental bittersweet will continue to expand within Townsend in response to climate change.

Cultural Resources—General Impacts

Climate change may negatively affect cultural resources, their preservation, and maintenance (EEA 2022a; International Council on Monuments and Sites (ICOMOS) Climate Change and Cultural Heritage Working Group 2019; Rockman et al. 2016: 3, 18; United Nations Educational, Scientific and Cultural Organization (UNESCO) World Heritage Center 2007). In Massachusetts, cultural resources may be exposed to the following natural phenomena that are correlated with adverse impacts: higher annual average temperature (especially in winter), increased numbers of freeze-thaw cycles, increased precipitation intensity, higher relative humidity, higher wind speeds, an increase in severe storm events, increased numbers and severity of wildfires, more severe seasonal droughts, increase in number and severity of inland flood events, increased coastal flooding and erosion, increased probability of landslides, changes in groundwater levels, shifts in native and invasive species distribution, performance, and phenology; and changes in oceanic and atmospheric chemistry (Rockman at al. 2016; Commonwealth of Massachusetts 2023: 5.1-31–5.1-61).

The phenomena listed above may produce a variety of adverse impacts to Massachusetts' cultural resources. Sensitivity and potential impacts vary based on resource category (i.e., archaeological sites, cultural landscapes, ethnographic landscapes and sites, and buildings and structures). Resource-specific factors such as location, design, materials, condition, etc. will also influence sensitivity and consequent impacts. All categories of cultural resources may be subject to complete or partial destruction through wildfire, inland flooding, sea level rise, storm surge, or landslides. Additionally, these resource categories may be subject to other types of impacts, as follows. Archaeological sites may have site stratigraphy disrupted by changes in hydrography, may suffer accelerated decomposition of artifacts and features, and may be impacted inadvertently during disaster response. Cultural landscapes may lose plantings due to a variety of stressors (e.g., drought or flood, pests, soil salinity), may be infiltrated by invasives, may be eroded by surface runoff, may experience more rapid deterioration of hardscaping and site furnishings, and may be damaged by high wind or heavy snow events. Ethnographic landscapes, traditional cultural places, and associated communities (including Indigenous peoples) may suffer both tangible and intangible impacts such as loss or diminishment of natural species used for food, ceremony, or medicine; alterations in timing of hunts, etc.; increased difficulty of vulnerable subgroups (e.g., the

elderly) to perform outdoor tasks; and a loss of cultural knowledge associated with resources and practices. Buildings and structures may be damaged or destroyed by high wind or heavy snow events, suffer accelerated deterioration through a variety of mechanisms (e.g., elevated humidity, chemical reactions, destructive pests and organisms), may be destabilized by hydrological changes, or be damaged by inadequate gutters or drainage systems (ICOMOS Climate Change and Cultural Heritage Working Group 2019: 73–89; Rockman et al. 2016: 20–24). (See Rockman et al. 2016: 19–24 for a detailed assessment of the potential impacts of climate change on cultural resources.)

Cultural Resources—Property-Specific Exposure and Impacts

The Forest's known cultural resources with high exposure to climate change hazards are the identified cellar hole and two dams that are within FEMA's most recent 0.2%-chance flood zone and therefore may be threatened during severe flood events (MassGIS 2023). (Precipitation changes due to climate change (see EEA 2022b and Weston and Sampson 2022) are not factored into FEMA flood plain modeling. Climate change may result in additional exposure to and impacts from flooding for cultural resources in the future. A FEMA-contracted report (AECOM 2013) finds that: "For the riverine environment, the typical 1% annual chance floodplain area nationally is projected to grow by about 45%, with very large regional variations ... approximately 70% of the 45% (or 31.5%) growth in the 1% annual chance floodplain is due solely to climate change" (AECOM 2013: ES6–ES7). Site-specific projections for future floodplain areas were not available at the time this RMP was prepared.)

Recreation—General Impacts

Outdoor recreation and park visitation are dependent on weather and climate and will be affected by a warming climate (Wilkins and Horne 2024). Higher temperatures positively affect participation in most outdoor activities, except snow-based activities (Wilkins and Horne 2024). "Winter is warming substantially faster than other seasons, and winter warming is especially pronounced in the...Northeastern United States" (Wilkins and Horne 2024: 15). Exposure to this climate change phenomenon is projected to significantly reduce the length of winter recreation seasons for downhill skiing, cross-country skiing, and snowmobiling, decreasing recreational opportunities and causing substantial economic impacts (Wobus et al. 2017). Whitewater rafting, primitive area use, and hunting are also projected to be negatively impacted by exposure changing weather patterns associated with climate change (Askew and Bowker 2018). Although "coldwater fishing habitat is expected to decline under a warming climate, which will likely result in fewer fishing days," overall fishing participation in the Northeast is projected to rise "due to the more favorable temperatures" (Wilkins and Horne 2024: 11). Horseback riding on trails, boating, swimming, and visiting interpretive sites are also expected to see higher participation in the Northeast under climate change (Askew and Bowker 2018). Temperature preferences of campers indicate that the "number of ideal days" for camping will also increase (Wilkins and Horne 2024: 13). Participation in biking is also projected to increase, especially in the winter and shoulder months (Wilkins and Horne 2024: 13). Climate change may also impact outdoor recreation through increased impacts to recreation infrastructure (e.g., flooding impacts), and increased exposure to disease vectors (e.g., mosquitoes and ticks), longer pollen seasons, and heat-related illnesses (O'Toole et al. 2019).

Recreation—Property-Specific Exposure and Impacts

Recreation activities at the Forest likely to be negatively impacted by exposure to weather changes resulting from climate change include hunting and snow-dependent sports (i.e., cross-country skiing, snowmobiling, and dog sledding). Other recreation activities including canoeing and kayaking, mountain biking, and horseback riding may see increased participation.

Recreation infrastructure with exposure to increased precipitation and flooding associated with climate change include 1,300 feet of road and trail infrastructure are exposed to the anticipated increase in precipitation (i.e., a greater than 10-inch increase in maximum daily rainfall; Table 12) and within FEMA's 0.02%-chance flood zone (MassGIS 2023). (As noted above, precipitation changes due to climate change are not factored into FEMA flood plain models and projections for future floodplain areas were not available at the time this RMP was prepared.)

APPLIED LAND STEWARDSHIP ZONING

DCR assesses the appropriate uses and stewardship of its properties at two spatial scales: the landscape level and the property level.

Landscape Designation

In 2012, DCR engaged in a comprehensive system-wide assessment of lands managed by its Division of State Parks and Recreation, designating them as Reserve, Woodland, or Parkland. (See Landscape Designations for DCR Parks & Forests: Selection Criteria and Management Guidelines (DCR 2012) for details.) Multiple Landscape Designations may apply to individual properties with diverse resources and levels of development. All of Townsend State Forest was designated Woodland. Identification of Land Stewardship Zones within Townsend was performed in the context of the Woodland Landscape Designation.

The following Land Stewardship Zoning is recommended to guide management and any future development. (See Figure 1. Land Stewardship Zoning Map, page 25, and the Land Stewardship Zoning layer on DCR's Stewardship Map: https://dcrsgis-mass-eoeea.hub.arcgis.com/.)

Zone 1

Zone 1 areas have highly sensitive ecological and/or cultural resources that require additional management approaches and practices to protect and preserve these special features and their values (DCR 2012). The following areas of Townsend have been designated Zone 1.

- Banks of the Squannacook River extending 200 feet inland from the shoreline (as represented by the Open Water features of the MassDEP Wetlands GIS layer). Where MassDEP Wetlands are present that are coterminous with the Squannacook, Zone 1 encompasses the entirety of these wetlands. This Zone 1 designation is intended to help preserve the river as a Coldwater Fish Resource, to perpetuate natural and recreational values recognized in the Squannassit ACEC, to protect habitat of species designated under MESA, and to maintain the river's character as a Wild and Scenic River.

Zone 2

Zone 2 areas provide for a balance between resource stewardship and recreational opportunities that can be appropriately sustained. They include stable yet important cultural and natural resources. These areas provide a buffer for sensitive resources, recharge areas for surface and groundwaters, and large

areas where existing public recreation activities can be managed at sustainable levels (DCR 2012). The following areas of Townsend have been designated Zone 2.

- All areas not identified as Zone 1 and Zone 3.

Zone 3

Zone 3 areas include altered landscapes in active use and areas suitable for future administrative, maintenance, and recreation areas (DCR 2012). The following areas of Townsend are currently developed, appropriate for potential future development, or intensively used for recreation. They have been designated Zone 3.

- The existing primary entrance parking lot on Dudley Road, approximately 0.30 acres (13,000 square feet).
- Approximately 0.25 acres (10,000 square ft) for possible future improvement of the Old Turnpike Road parking area (subject to appropriate environmental review and permitting) in order to improve access to the westerly portion of the Forest and possibly as parking associated with future development of the Squannacook River Rail Trail.
- Approximately 0.125 acres (5,000 square ft) for the existing parking lot on Fessenden Hill Road.
- Approximately 0.25 acres (10,000 square feet) at on Brookline Road/Rt. 13 for a possible future parking lot to improve access to northerly portions of the Forest (subject to appropriate environmental review and permitting). (This location shows evidence of past sand or fill excavation.)
- The structural footprint of two small dams near the Dudley Road entrance.

Significant Feature Overlay

Significant Feature Overlays provide precise management guidance in order to maintain or preserve recognized resources features regardless of the zone in which they occur. The following Significant Feature Overlays were developed for Townsend.

- **Area of Critical Environmental Concern (ACEC) Overlay.** The Squannassit ACEC, designated 2002, encompasses over 37,000 acres of the Nashua River's watershed (Secretary of Environmental Affairs 2002). All of Townsend State Forest falls within the ACEC. Projects and activities within ACECs must minimize adverse effects on sensitive resources and are guided by a variety of regulations and programs that are summarized in the ACEC Guide to State Regulations and Programs (DCR 2017).

DCR Stewardship Map Tool

This RMP should be viewed in conjunction with DCR's Stewardship Map, a GIS-based tool that allows users to view a property's natural, cultural, and recreational resources. The Stewardship Map tool is dynamic, and information continues to be updated after adoption of an RMP. Guidance for using the tool, as well as BMPs for resource stewardship, are located on the Stewardship Map site: https://dcrsgis-mass-eoeea.hub.arcgis.com/.

Because authorized trails are located within State-Listed Species Habitat on this property, managers should consult an additional GIS-based tool, the NHESP 2022 Guidance Codes for DCR Trail Maintenance Map. (https://mass-eoeea.maps.arcgis.com/home/item.html?id=cb252e8df40d408c81fe8fcf690e14f6) This tool allows users to select specific trail segments and identify restrictions and regulatory review

associated with performing 10 common trail maintenance activities on these segments. Because site-specific rare species information is confidential under Massachusetts law (M.G.L. c. 66, § 17D), access to this tool is restricted.

CONSISTENCY REVIEW

Resource Management Plans "shall ensure consistency between recreation, resource protection, and sustainable forest management" (M.G.L. c. 21, § 2F). For planning purposes, an activity is considered consistent with resource protection if it has no significant, long-term, adverse impact on resources. To this end, a series of indicators were developed to evaluate the impacts of recreation and forest management on natural and cultural resources.

Many activities with the potential to negatively affect resources are already subject to agency and/or regulatory review (e.g., forest management activities, projects within Priority Habitat). For these activities, compliance with state regulations, regulatory authority guidance, DCR policies and processes, and BMPs is considered an indicator of consistency between park use and resource protection. New indicators were generated for activities not subject to agency or regulatory review, and are based on available data, information readily identifiable via aerial imagery or site visits, assessments by DCR subject matter experts, or the property manager's knowledge of park conditions and use. (See Table 18, page 26.)

Indicators are applied during the RMP planning process in order to ensure a standardized assessment of consistency across all properties in the DCR system. Inconsistencies identified via the application of indicators are used to inform the development of management recommendations.

The status of indicators (Yes, No, Unknown, and N/A) were accurate at the time this RMP was prepared and were used for planning purposes. However, they represent a snapshot in time and may not reflect future conditions. In addition, the status of indicators will change as recommendations get implemented.

MANAGEMENT RECOMMENDATIONS

Twenty-three priority management recommendations were developed for this property. They are presented in Table 19, page 29. All recommendations are of equal importance.

Priority management recommendations derive from Threats, Opportunities, and Consistency Assessment information presented in this RMP. For a recommendation to be considered a priority and listed in the table, it must meet one or more of the criteria listed below. Maintenance and management needs not meeting one or more of these criteria are not included in the table but are identified in the Threats and Opportunities sections.

The following types of recommendations are considered priority:

- Natural resource stewardship and restoration activities consistent with park identity and intended to improve ecological function and connectivity.
- Cultural resource management activities consistent with park identity and intended to prevent the loss of integrity of significant cultural resources.
- Improvements consistent with park identity that are needed to support intended park activities.
- Actions required for regulatory compliance or compliance with legal agreements.

- Activities that prevent or ameliorate threats to the health and safety of park visitors and employees.
- Activities that address inconsistencies among recreation, resource protection, and sustainable forest management, as identified through use of the Consistency Assessment checklist.

Progress toward implementing priority recommendations is tracked through the use of DCR's Capital Asset Management Information System (CAMIS). The property manager should enter each recommendation listed in Table 19 (page 29) into CAMIS as a separate work order, noting "*RMP" in the description field. Non-traditional work orders (e.g., volunteer trail work, posting of Massachusetts Department of Public Health (DPH) Fish Consumption Advisory posters, certification of vernal pools) should be closed out by the property manager, once the recommendation has been implemented.

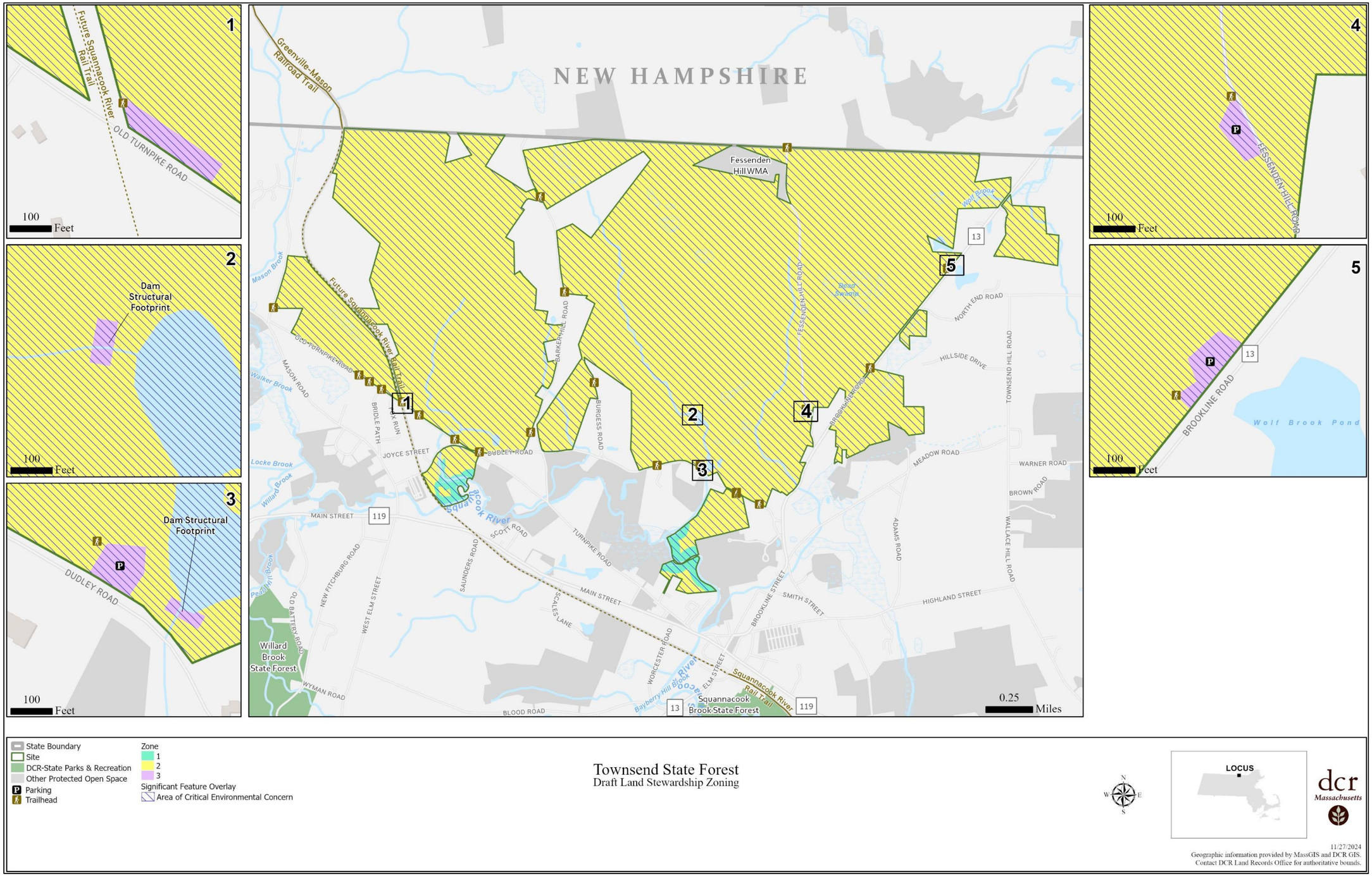

Figure 1. Land Stewardship Zoning Map.

Table 18. Consistency Assessment. This assessment represents a snapshot in time and may not reflect future conditions.

Category	Metric	Status
Landscape Designation	1. All development and uses of the park since 2012, or currently planned for the park, are consistent with its Landscape Designation(s).	Yes
Natural Resources	1. All projects (normal maintenance activities, special projects, volunteer projects) conducted within Priority Habitat were reviewed and approved through DCR's internal review process and by NHESP for potential impacts to rare species and their habitats.	Yes
Natural Resources	2. All projects conducted within areas subject to state and/or federal wetlands or waterways regulations were reviewed and approved through DCR's internal review process; reviewed and approved through the appropriate, local, state, and/or federal review process; and were carried out in accordance with the terms of a valid permit.	Yes
Natural Resources	3. Sensitive resource areas, such as steep slopes, riverbanks, streambanks, pond and lakeshores, wetlands, and dunes are free of desire paths and other user-created trails.	Yes
Natural Resources	4. Aquatic areas adjacent to beaches, boat ramps and launches, roads, and hiking trails are free of eroded sediments.	N/A
Natural Resources	5. The extent of exposed soil in campground and/or picnic sites is stable or decreasing.	N/A
Natural Resources	6. The extent of native vegetation in campground and/or picnic sites is stable or increasing. (As assessed by property manager.)	N/A
Natural Resources	7. Area of trail impacts in Reserves is less than 50% of total area. (See Naughton (2021) for information on primary area of trail impacts.)	N/A
Natural Resources	8. Congregations of breeding, migratory, or wintering wildlife are protected from disturbance by temporary (e.g., seasonal) restrictions on recreational access.	N/A
Natural Resources	9. Geocaches, letterboxes, orienteering control locations, and other discovery destinations are located outside sensitive natural resource areas and their locations have been reviewed and approved by park personnel. (As assessed by property manager.)	No
Natural Resources	10. Zone I wellhead protection areas are free of vehicle parking, chemical storage, or concentrated recreation.	N/A

Category	Metric	Status
Natural Resources	11. All boat ramps and launches have cleaning stations and/or educational signs and materials on preventing the spread of aquatic invasive organisms. (As assessed by property manager.)	N/A
Natural Resources	12. For each barrier beach there is a current, approved Barrier Beach Management Plan and all beach-related activities are conducted in accordance with this plan.	N/A
Cultural Resources	1. All maintenance activities and projects with the potential to cause sub-surface disturbance are being reviewed by the DCR archaeologist for potential impacts to archaeological resources.	No
Cultural Resources	2. All maintenance activities and projects affecting historic properties (buildings, structures, and landscapes over 50-years-old) are being reviewed by the Office of Cultural Resources to avoid adverse impacts.	No
Cultural Resources	3. Historic buildings, structures, and landscapes are being used, maintained, and repaired in a manner that preserves their cultural integrity and conveys their historic significance to park visitors.	No
Cultural Resources	4. Recreational activities such as hiking, biking, and boating are not eroding cultural properties such as archaeological sites or historic landscapes through creation of desire lines, rutting in the landscape, damage to historic built features, or excessive scouring (erosion) of coastal and shoreline areas.	No
Cultural Resources	5. Geocaches, letterboxes, and other discovery destinations are located away from sensitive cultural resources, and their locations have been reviewed and approved by park personnel.	No
Cultural Resources	6. Historic buildings, structures, landscapes, archaeological sites, and concentrations of historic resources are located outside of areas predicted to be subject to flooding, storm surge, or sea-level rise.	No
Recreation	1. Types of recreation, levels of recreational use, and types and extent of recreation infrastructure are consistent with the park's identity statement.	Yes

Category	Metric	Status
Recreation	2. Trail density is consistent with the park's Landscape Designation(s). (See Trails Guidelines and Best Practices Manual (DCR 2019a) for density thresholds.)	Yes
Recreation	3. All authorized trail construction was performed in accordance with an approved Trail Proposal Form.	Yes
Recreation	4. Over 90% of the park's official trails network is classified as being in Fair or better condition.	Yes
Recreation	5. Recurring use by OHVs is restricted to authorized trails. (As assessed by property manager.)	No
Recreation	6. There is a high level of compliance with dog leash regulations and policies. (As assessed by property manager.)	No
Recreation	7. Athletic fields are free of recreation-caused impacts (e.g., bare spots) to turf. (As assessed by property manager.)	N/A
Recreation	8. Water-based recreation is consistent with "Uses Attained" designation as identified by MassDEP in its most current integrated list of waters (e.g., MassDEP 2023); DPH fish consumption advisories; and/or water quality testing at waterfront areas.	Yes
Recreation	9. Recreation facilities are located outside of areas subject to flooding, storm surge, or sea-level rise.	No
Sustainable Forest Management	1. Forestry activities are consistent with Landscape Designation and associated forestry guidelines.	Yes
Sustainable Forest Management	2. Forestry activities are consistent with current Forest Resource Management Plan.	N/A
Sustainable Forest Management	3. Tree cutting is performed in accordance with an approved cutting plan, if required under the Massachusetts Forest Cutting Practices Act (M.G.L. c. 132, §§ 40–46).	Yes

Table 19. Priority Recommendations for Townsend State Forest. All recommendations are of equal importance. When multiple agency parties are responsible for implementing a recommendation, the lead party, or parties, are identified parenthetically in the Implementation column. Property managers should enter these recommendations as work orders in CAMIS to ensure their tracking and implementation.

Category	Recommendation	Implementation
Natural Resources	Apply Landscape Designations to those portions of the Forest currently lacking such designations.	Management Forestry (Lead), GIS Program
Natural Resources	Monitor for Town of Townsend initiatives to deaccession or otherwise sell open space parcels appropriate for Forest expansion.	Land Protection Program (Lead), Park Operations
Natural Resources	Document and resolve potential encroachment near North End Road in accordance with Agency-wide Guidance and Best Management Practices (DCR 2019b).	Contractor, Management Forestry (Lead), Office of the General Counsel, Park Operations
Natural Resources	Survey, document, and submit documentation to certify potential vernal pools, in accordance with DCR (n.d.a) and MassWildlife (2009), as warranted.	Office of Natural Resources (Lead), Volunteers
Natural Resources	Following appropriate review and permitting, implement the Invasive Plant Management Plan: Central Region (BSC Group 2017) for terrestrial invasive plants. Maintain actions as needed.	Office of Natural Resources (Lead), Park Operations, Partner
Cultural Resources	Conduct an archaeological reconnaissance survey (950 CMR 70) in cooperation with interested partners such as the Town of Townsend and interested Tribes. Complete appropriate Massachusetts Historical Commission archaeological site forms for identified archaeological resources.	Consultant, Office of Cultural Resources (Lead), Partner(s)
Cultural Resources	Work with Indigenous partners to inventory, document, conserve, and interpret Indigenous peoples' resources and history within the Forest.	Office of Cultural Resources (Lead), Partner
Cultural Resources	Implement Best Management Practices for archaeological resources, particularly clearing of vegetation and monitoring for destructive behaviors.	Office of Cultural Resources, Park Operations (Lead)

Category	Recommendation	Implementation
Cultural Resources	Take appropriate steps to evaluate cellar holes where unauthorized digging is occurring (primarily on Fessenden Hill Road) and to determine if any mitigative or preventative actions are necessary.	Bureau of Ranger Services, Office of Cultural Resources (Lead), Park Operations
Cultural Resources	Take appropriate steps to define the possible archaeological footprint of Civilian Conservation Corps (CCC) Camp S-82 and thus determine whether off-highway vehicle (OHV) use is damaging the site. As needed, prevent additional vehicle damage through posting, physical barriers or other means.	Office of Cultural Resources (Lead), Park Operations
Cultural Resources	Fill or cap the open well adjacent to Fessenden Hill Road.	Office of Cultural Resources, Park Operations (Lead)
Recreation	Resolve trail-related threats and opportunities identified in this RMP, in accordance with Trails Guidelines and Best Practices (DCR 2019, or update), through the following actions: • Maintain authorized trails, as identified in the DCR Trail Data Layer provided to the Natural Heritage and Endangered Species Program in 2021, and in accordance with the Recreational Trail Maintenance and Biodiversity Conservation 2021 update. • Evaluate trail segments for discontinuation or active closure, including those that are: unauthorized, unsafe, connecting to privately-owned property, located in environmentally or culturally sensitive areas, or otherwise inconsistent with DCR Trails Guidelines and Best Practices. Provide an updated trail data layer to the Natural Heritage and Endangered Species Program. • Establish new trails, as warranted, following regulatory review. Provide an updated trail data layer to the Natural Heritage and Endangered Species Program.	Office of Natural Resources), Park Operations (Co-Lead), Partners, Trails and Greenways Section (Co-Lead)

Category	Recommendation	Implementation
Recreation	Establish a DCR web page for Townsend State Forest	Interpretive Services, Regional Staff (Lead), Park Operations, Web Content Creator
Recreation	Create a Forest trail map.	GIS Program, Interpretive Services, Trails and Greenways Section (Lead)
Recreation	As appropriate, promote the Executive Office of Energy & Environmental Affairs' Environmental Justice Policy goals at Townsend State Forest.	Interpretive Services (Co-Lead), Land Protection Program (Co-Lead), Partners, Trails and Greenways Section (Co-Lead)
Recreation	Work with the geocaching community to ensure that caches located in sensitive natural and cultural resources are relocated out of those areas and that any new geocaches are placed outside of sensitive areas and with the approval of the property manager.	Office of Cultural Resources, Office of Natural Resources, Park Operations (Lead)
Recreation	Enhance main gateway at Dudley Road: • Lower height of the existing kiosk, or build a new kiosk if appropriate, to meet accessibility standards. • Develop and install a Welcome Wayside panel. • Consider addition of lead-in sign on street frontage adjacent to gateway or moving the Main Identification sign to this location. • Replace non-standard forest road gate.	Interpretive Services (Co-Lead), Park Operations (Co-Lead), Sign Shop
Recreation	Add DCR Cantilevered Identification Sign and Rules and Regulations notices at parking lots on Fessenden Hill and Old Turnpike roads.	Park Operations (Lead), Sign Shop
Recreation	Conduct study to determine if expansion of the Old Turnpike Road parking area is warranted.	Facilities Engineering (Lead), Park Operations
Recreation	Repair or replace collapsed culvert (a potential Civilian Conservation Corps resource) on forest road near Old Turnpike Road.	Office of Cultural Resources, Office of Natural Resources, Park Operations (Lead)

Category	Recommendation	Implementation
Recreation	Identify and build or maintain (after appropriate review and permitting) trail and forest road crossings over streams and wetlands that are a high priority due to safety or resource protection.	Forest Fire Control, GIS Program, Office of Natural Resources, Park Operations (Lead)
Recreation	Implement measures to curb unauthorized off-highway vehicle (OHV) use, such as adding gates and other physical barriers, and erecting signage prohibiting OHV use, particularly at the New Hampshire state boundary.	Park Operations
Recreation	Increase the presence of Environmental Police Officers, DCR Rangers, and/or Forest operations staff, as appropriate and available, in areas with high unauthorized off-highway vehicle (OHV) use.	Bureau of Ranger Services (Co-Lead), Regional Staff (Co-Lead), Park Operations

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