dcr
Massachusetts

Resource Management Plan
Pearl Hill State Park

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.

Pearl Hill State Park

https://www.mass.gov/locations/pearl-hill-state-park

1. Property Overview

Characteristic	Value
Date Established	1962
Location	Townsend
Ecoregion	Boston Basin and Southern New England Coastal
Watershed	Nashua
DCR Region	Central
DCR District	Central Highlands
DCR Complex	Otter River
Management Forestry District	Northeast
Fire Control District	North Middlesex
Size (acres)	182.8
Boundary Length (miles)	2.4
Elevation - Minimum (feet)	389.9
Elevation - Maximum (feet)	519.1
Environmental Justice (acres)	0.0
Estimated Annual Attendance (2023)	30,000
Interpretive Programs (# programs, 2023)	62
Interpretive Programs (# attendees, 2023)	304

2. Landscape Designations

Designation	Acres
Parkland	182.8
Reserve	0.0
Woodland	0.0
No Designation	0.0

3. Regulatory Designations

Designation	Acres
Area of Critical Environmental Concern – Squannassit	182.8
Outstanding Resource Waters – Squannacook River	182.8
Priority Habitat	82.1
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)
Lunenberg Snow Riders

7. Features of Interest

Feature
Campground with large group site
Park Hill Brook Pond waterfront area and dam
Picnic Facilities
Trail System

8. Natural Resources

Resource	Value
Tree Canopy (acres)	173.7
Rivers and Streams (miles)	1.0
Open Water (acres)	0.0
Wetlands (acres)	9.1
Certified Vernal Pools (#)	0
Potential Vernal Pools (#)	0
State-Listed Species (# Regulatory)	1
State-Listed Species (# Non-Regulatory)	0
Federally Listed Species (#)	0
Aquatic Invasive Plants (# known species)	0
Terrestrial Invasive Plants (# known species)	7

9. Forest Management (Since 2012)

Management Objective	Acres
N/A	0.0

10. History of Wildfires and Conditions Influencing Future Wildfires

Wildfire Attribute	Value or Characteristic
Number of wildfires on property; 2019–2023	3
Acres burned by wildfires on property; 2019–2023	11.2
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)	25.0
Flood (0.2%-chance)	25.0
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	#
Recreation field	1
Campground	1
Picnic Area	1
Trail System	1
Volleyball Court	1
Waterfront Area	1

15. Recreation Activities

Activity
Bicycling, mountain
Camping
Dog walking, on-leash
Fishing, fin fish
Hiking/Walking
Horseback Riding
Hunting
Nature study/Photography
Orienteering
Running/jogging
Skiing, cross-country
Snowmobiling
Snowshoeing
Swimming/Sunbathing
Volleyball

16. Roads and Trails

Metric	Value
Roads - Unpaved (miles)	0.9
Roads - Paved (miles)	3.3
Forest Roads - Unpaved (miles)	0.8
Forest Roads - Paved (miles)	0.0
Trails - Unpaved (miles)	2.5
Trails - Paved (miles)	0.0
Trails - Unauthorized (miles)	0.3
Trail Density (miles/acre)	0.019
Area of Impact (acres)	159.9

17. Parking

Parking Resources	#
Lots	1
Parking Spaces - Total	80
Parking Spaces - Accessible (HP)	2
Parking Spaces - Other	78

INTRODUCTION

Pearl Hill State Park (Pearl Hill, or the Park) is in the mostly rural Town of Townsend, approximately 22 miles west of Lowell and 4 miles from the Massachusetts-New Hampshire border. The Park is situated almost entirely within the larger (and older) Willard Brook State Forest (Willard Brook) on a tract of land between Vinton Pond, New Fitchburg, and Old City roads. Other than Willard Brook, neighboring parcels are sparsely settled with year-round and seasonal residential properties.

The Park 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 Willard Brook State Forest. Groups and individuals, including Indigenous peoples known as the Nipmuc, Pawtucket, and Pennacook, are recorded in available documentation (Native Land Digital 2023) as having relationships to this place over seasons and generations. Ponds and rivers in the Park's immediate area were likely used as resource gathering areas. Following Indigenous peoples' dispossession, lands that would become Townsend were granted to settlers in 1719, and Townsend was incorporated in 1732. The Commonwealth's Department of Natural Resources (DNR) established Willard Brook in 1929. Its camping and beach facilities were heavily used after World War II, leading the Commonwealth to undertake an expansion along Pearl Hill Brook (DNR and Edwards, Kelcey and Beck 1957: 118). In 1953, the Massachusetts General Court (MGC) authorized land acquisition between Vinton Pond and New Fitchburg roads for the purpose of "preserving the forest growth and area, otherwise essential for recreational development" and authorized construction of "roads, parking areas, comfort stations, bathhouses, shelters, dams, beaches and other facilities necessary for recreational development" (MGC 1953). Land acquisition and development proceeded through the 1950s, the camping area was completed and opened in 1962, and the pond and dam were completed a year later (DNR 1953-1957: 143, 165, 171, 219; 1957–1961: 237, 241, 357, 461; 1961–1962: 25; 1961: 7; 1962: 11; Historic Aerials.com 1963). Administration of Pearl Hill was (and is) closely tied to that of Willard Brook. Consequently, Pearl Hill was not named and designated as a state park until circa 1971.

Pearl Hill offers day and overnight visitors a scenic and quiet place for passive recreation and camping. The Park is organized around the Pearl Hill Brook corridor and associated wetlands and white pine forests. A campground, associated comfort stations, and recreation field are sited to the west of the brook, while the day use area (see cover photo) is sited east of the brook. The day use area provides a waterfront area, bathroom, and picnic grove. A small trails network runs through the Park and offers connections to the surrounding Willard Brook trails network.

PARK IDENTITY

Pearl Hill State Park offers secluded camping, swimming, and passive trails-based recreation in north-central Massachusetts. All future activities and improvements should, consistent with the Park's Parkland designation, ensure continued high-quality day and overnight recreation opportunities while stewarding upland and riparian resources and habitat and known and potential cultural resources.

DEFINING RESOURCES AND VALUES

Pearl Hill State Park is a relatively compact facility whose identity is derived from its overnight and day use recreation amenities and the pond and wetlands along Pearl Hill Brook. Resources that define the park are related to this identity and consist of:

- Pearl Hill Brook. Pearl Hill Brook and its valley are the dominant natural resources of the Park and organize recreational resources and activities. The brook and associated wetlands are important for habitat and water supply values, which are recognized through:
  - Designation as an Outstanding Resource Water (314 CMR 4.06).
  - Protection under the Squannacook and Nissitissit Rivers Sanctuary (Massachusetts General Laws (M.G.L.) Ch. 132A, §17).
  - Inclusion in the Squannassit Area of Critical Environmental Concern (ACEC, Secretary of Environmental Affairs 2002).
  - Identification as a Coldwater Fish Resource (Massachusetts Division of Fisheries and Wildlife (MassWildlife) 2022).
- Excellent, accessible recreational infrastructure that is near residents of the Boston Metropolitan Area and Merrimac Valley communities (including southern New Hampshire) and is also used by visitors from outside this region:
  - The day use area at Pearl Hill Brook Pond with its bathroom, picnic grove, waterfront area, and dam.
  - The campground.
  - The trails network and its connections to the larger Willard Brook network.

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 Pearl Hill State Park. The sequence of these statements does not reflect their level of significance.

- Pearl Hill State Park is a product of the post-World War II recreational boom. At the time, adjacent Willard Brook State Forest was one of the most visited sites in the state. Rather than expand Willard Brook State Forest, the department used existing land and acquired new land to create Pearl Hill State Park to ease the recreational demand at the State Forest.
- As part of the larger Squannassit ACEC, the site has been identified as part of a broader area of special recognition because of the quality, uniqueness, and significance of its natural and cultural resources.

- The area immediately around Pearl Hill Brook and Pearl Hill Brook Pond is classified as Priority Habitat (PH2035). This area is home to species are either at risk, or may become at risk, of extinction.

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 Pearl Hill State Park is:

> Dedicated recreational land supports more opportunities for conservation and stewardship.

VISITOR EXPERIENCE

Pearl Hill State Park provides a variety of visitor experiences, including the following:

- **Virtual Experience.** Potential visitors will find information about Pearl Hill on DCR's web site. The Park has its own web page that provides potential visitors information needed to plan a visit (https://www.mass.gov/locations/pearl-hill-state-park).
- **Entering the Park.** Visitors in vehicles enter the park from New Fitchburg Road through a well-kept formal gateway with a Main Identification Sign. A contact station and directional signage are located immediately inside the gate and offer visitors the option of proceeding to the campground or parking in the day use area adjacent to the contact station. The waterfront area, picnic area, and bathroom are all visible from the day use parking area.
- **Pearl Hill Brook Day Use Area.** Visitors can engage in multiple recreational activities at this location, including fishing, canoeing/kayaking, swimming, sunbathing, picnicking, and field games. The small picnic area (approximately 10 tables) is located adjacent to the waterfront area and extends northeast along the Pearl Hill Brook Pond shoreline to the pond's dam. A recreation field (formerly used as a picnic area) is located between the day use area and the campground and is outfitted with amenities for volleyball, tetherball, and horseshoe. This facility may be reserved for day use.
- **Camping.** Camping is open from Memorial Day to Labor Day with reservations obtained through Reserve America. Campers follow a circulation road west across Pearl Hill Brook and into a shady campground that offers 50 individual sites (including 2 accessible sites), a group campsite (technically on land administered as Willard Brook, but managed as a Pearl Hill amenity), a comfort station, 2 bathrooms, and a community firepit.
- **Trail-based Passive Recreation.** Visitors seeking additional recreational opportunities may access a modest trails network of 3.3 miles that offers opportunities for hiking, mountain biking, snowshoeing, horseback riding, and cross-country skiing. An additional 14.1 miles of forest road and 16.3 miles of trail are offered via connections to Willard Brook.
- **Trail-based Motorized Recreation**. Park roads are open to snowmobiles in winter as snow conditions allow.

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 26).

Natural Resources

Threats

- A lack of bridges or walkways at trail crossings of streams and wetlands is threatening the health of wetland resource areas.
- The siting of a trail on a steep sandy bank is resulting in erosion and sedimentation to a wetland associated with Pearl Hill Brook.
- The following seven Invasive Species have been identified at Pearl Hill: autumn olive, burning bush, Japanese barberry, Morrow's honeysuckle, multiflora rose, Oriental bittersweet, and purple loosestrife (BSC Group 2017: 32, 33). Invasive species may negatively impact both the ecological integrity and biodiversity of the Park.
- A majority of Pearl Hill's day use area, including the recreation field and dam, are within Priority Habitat for one reptile species protected under the Massachusetts Endangered Species Act (MESA) and designated a Species of Special Concern by the Natural Heritage & Endangered Species Program (NHESP). Recreation activities, facility maintenance, and Pearl Hill Dam operations may threaten this habitat and disrupt species behavior.
- Activities and infrastructure within the Zone I Wellhead Protection Area for the campground well (no. 2299003-02g) are inconsistent with Massachusetts Department of Environmental Protection (MassDEP) guidance and best management practices for wellhead protection (MassDEP 1995; 2011). These activities and infrastructure include picnicking, vehicular parking, and the comfort station and its associated septic system.
- Portions of the Zone I Wellhead Protection Area for the day use area well (no. 2299003-01g) are located in a parking area, a public right-of-way (New Fitchburg Road), and on private land and therefore are inconsistent with MassDEP guidance and best management practices for wellhead protection (MassDEP 1995; 2011).
- There are at least two unapproved geocaches in the Park. Inappropriately located geocaches may threaten sensitive natural resources.
- Park visitors, including mountain bikers, have created several unauthorized trails. Construction of trails without authorization or applicable regulatory review may threaten habitat for species protected under MESA, natural communities, and/or ecosystem functions.

Opportunities

- There is an opportunity to correct a discrepancy between DCR GIS data and Town of Townsend assessor data at the intersection of New Fitchburg and Vinton Pond Road. At this location, the Town's road right-of-way is shown as extending into a developed portion of the Park that includes the day use area parking lot.
- Pearl Hill is within the Squannassit ACEC, which encompasses valuable water supply, habitat, open space, cultural, and water body resources. ACEC designation offers an opportunity to enhance and collaborate on resource protection within and around the Park (Secretary of Environmental Affairs, 2002).
- 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 is an opportunity to protect the Park's biological health and aesthetic qualities through targeted removal of invasive plant species.
- There is an opportunity to incorporate habitat management efforts for the NHESP Species of Special Concern into Pearl Hill operations and visitor services work and dam management. Consultation with the State Herpetologist would be beneficial to such efforts (Leddick 2024a).
- Due to the location of the park "on outwash and ice contact features (sand and gravel), the NHESP has observed that the property "has great barrens/oak woodland restoration potential" (Leddick 2024a). The NHESP has made similar comments concerning Willard Brook Forest (see associated RMP), indicating that there may be opportunities for continuous areas of habitat restoration across the two properties (Leddick 2024b).

Cultural Resources

Threats

- Natural flood events or recreational activities such as hiking, camping and mountain biking may threaten archaeological resources at the park.
- There are at least two unapproved geocaches in the Park. Inappropriately located geocaches may threaten sensitive cultural resources.
- Construction and use of the previously mentioned unauthorized trails may disturb areas of the Park that have potential archaeological resources.

Opportunities

- The popularity and location of Pearl Hill and adjacent Willard Brook offer opportunities to create a centralized location for interpretation of Indigenous and Civilian Conservation Corps history.
- Portions of the Park were formerly Girl Scout Camp Kirby, and this history could be interpreted as part of a larger program concerning the recreational history of the area.

Recreation

Threats

- According to visitor input provided to park staff, accumulated sediment and vegetation growth in Pearl Hill Brook Pond are negatively affecting visitors' enjoyment of the waterfront area and pond.

- Excessively high Enterococci bacteria counts, as well as other safety concerns, have resulted in multiple waterfront area "postings" (advisories against swimming) at Pearl Hill Brook Pond, limiting visitor enjoyment of this facility. Between 2012 and 2021, the most recent 10-year period for which there are data, there were 64 single sample exceedances (i.e., levels of bacterial contamination in excess of regulatory standards) (Massachusetts Department of Public Health (DPH) 2013–2022). A 2006 water quality study suggested that periods of low flow during the summer months resulted in limited flushing of the beach area and recommended installation of a water circulation device in the vicinity of the main beach for remediation purposes, as well as a sanitary survey and bacteria source tracking to identify and remediate any source(s) of bacteria pollution (MassDEP 2012: 33). Rain gardens may also be part of the solution to this issue.
- The beach sand at the waterfront area needs to be refreshed in order to improve the visitor experience.
- The park's information kiosk currently lacks a welcome wayside that would inform visitors of the key resources, rules, and recreation opportunities within the park.
- The large group camping site is popular, but visitor enjoyment is currently limited by a lack of restroom facilities. Guests must rent their own portable toilet.
- The Friends Loop Trail is currently missing a key bridge over Pearl Hill Brook (near the contact station), limiting visitor enjoyment of this amenity.
- The Park is located in a watershed with a Total Maximum Daily Load (TMDL) report required to address water quality impairments (per MassDEP 303d list) to Pearl Hill Brook (Assessment Unit (AU) ID MA-8180). Although the waterbody is listed as requiring a TMDL (Category 5 of the 303d list) a TMDL has not yet been developed. Designers of future projects should focus on addressing identified impairments, in accordance with the DCR Stormwater Design Handbook (VHB 2022).
- There are accessibility issues park-wide that are identified in the March 2022 Pearl Hill State Park, West Townsend, MA: Program Accessibility Assessment (Institute for Human Centered Design (IHCD) 2022). These accessibility issues threaten the access to and quality of experiences at the Park for people with disabilities. Noteworthy issues include, but are not limited to:
  - Lack of accessible parking adjacent to contact station and day use bathroom.
  - Lack of accessible service desk in the contact station.
  - Lack of fully accessible routes to the contact station, beach, day use bathroom, and drinking fountain.
  - The campground's firepit and bathroom designs, and the route to and into the campground comfort station.
- Non-recreational (i.e., unhoused) campers occasionally cause incidents in the campground that threaten other campers' enjoyment of the camping experience.
- Non-recreational (i.e., unhoused) campers are avoiding the 14-day stay limit through a "work-around" in the ReserveAmerica system. An alert system that formerly notified DCR staff of this issue is no longer functioning. This allows the visitor experience to continue to be diminished, as described in the previous bullet.

- The size of visitor's camping equipment (i.e., tents, vehicles, and accessories) has been increasing and the camp site's square footage is sometimes not adequate for this equipment. This sometimes leads to unmet visitor expectations or a diminished experience.
- Increasing numbers of visitors on mountain bikes is resulting in an increase to trail erosion.
- Pearl Hill contains lowland areas along Pearl Hill Brook that are within the Federal Emergency Management Agency's (FEMA) 1.0%-chance flood zone (Massachusetts Bureau of Geographic Information (MassGIS) 2023). The Pearl Hill Brook Dam (No. MA02498), waterfront area, approximately 0.5 miles of trail, and approximately 150 feet of campground road and its associated culvert over Pearl Hill Brook are exposed to inundation due to their location within this zone.

Opportunities

- There is an opportunity to resolve threats to Pearl Hill Brook Pond water quality by 1) conducting studies of beach carrying capacity; 2) implementing a program to identify upstream pollutant sources; and 3) installing a water circulation device for remediation.
- There is an opportunity to expand and improve the visitor experience of people with disabilities by addressing identified accessibility issues (IHCD 2022).
- Due to a lack of cellular connectivity, there is currently no option for day use visitors to pay their parking fee via a contactless method. There is an opportunity to improve the visitor experience and save field staff time by establishing such payment infrastructure in collaboration with local telecommunications providers.
- Redesigning the information kiosk in the day use area with a welcome wayside would make the sign more user-friendly and provide visitors with the information needed to enjoy their park visit.
- Listing the Pearl Hill Brook Pond Dam in the Capital Asset Management Information System (CAMIS) would facilitate maintenance of this important structure.
- Completing slated demolition of the old Girl Scout camp administration building will improve the appearance of the Park and reduce staff burdens associated with its oversight.
- The increasing popularity of mountain biking at Pearl Hill and adjacent Willard Brook State Forest offers opportunities to partner with the New England Mountain Bike Association or other user group to maintain or improve trails at the property and ensure compliance with DCR regulations.
- The undulating topography of coarse glacial deposits in the park provides an opportunity for interpretive programming regarding the park's geological history.
- Installing contactless payment infrastructure for parking fee collection at the day use area would save staff time for other visitor services and property management tasks.
- Pearl Hill is located within the Freedom's Way National Heritage Area, offering opportunities for agency partnerships, grants, and potentially higher visibility for the Park (Freedom's Way Heritage Association, Inc. 2015).
- Installation of a new pavilion and playground (under internal consideration at the time this RMP was prepared) would increase the enjoyment and user base of the Park.

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 (Massachusetts Executive Office of Energy and Environmental Affairs (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 Massachusetts Natural Heritage and Endangered Species Program 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

Pearl Hill Brook, for its entire length within the Park, has been identified as a Coldwater Fish 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).

Eastern newts and spotted salamanders have been reported in the Park. Populations of these amphibians may be threatened by the impacts of climate change.

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 Pearl Hill State Park. "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 Pearl Hill 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

No cultural resources with known elevated exposure or sensitivity to potential consequences of climate change were identified at this property.

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 Park likely to be negatively impacted by exposure to weather changes resulting from climate change include snow-dependent sports (i.e., snowmobiling and snowshoeing). Other recreation activities may see increased participation, especially those associated with the waters of Pearl Hill Brook Pond. Fishing, swimming, and other water-based activities may experience increased participation due to the anticipated increase in temperature (i.e., more than 30 additional days with temperatures over 90° F; Table 12). Demand for camping in Pearl Hill's campground may also increase.

Recreation infrastructure with exposure to increased precipitation and flooding associated with climate change include the facilities at Pearl Hill Brook Pond day use area (e.g., dam and waterfront), approximately 150 feet of campground road and its associated culvert over Pearl Hill Brook, and approximately 0.5 miles of trail. These fall within the most recent FEMA 1.0%-chance flood zone (MassGIS 2023) and are exposed to the anticipated increase in precipitation (i.e., a greater than 10-inch

increase in maximum daily rainfall; Table 12). (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.)

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 Pearl Hill State Park was designated Parkland. Identification of Land Stewardship Zones within Pearl Hill was performed in the context of the Parkland Landscape Designation.

The following Land Stewardship Zoning is recommended to guide management and any future development. (See Figure 1. Land Stewardship Zoning Map, page 22, 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 Pearl Hill have been designated Zone 1.

- The Pearl Hill Brook corridor outside of the developed campground and day use areas. These Zone 1 areas recognize the designation of NHESP Priority Habitat for a reptile Species of Special Concern, as well as the recognition and protection of Pearl Hill Brook (and associated wetlands) as an important water resource under the following legislation and environmental programs: Outstanding Resource Water (314 CMR 4.06), the Squannacook and Nissitissit Rivers Sanctuary (M.G.L. Ch. 132A, §17), the Squannassit ACEC (Secretary of Environmental Affairs 2002), and Coldwater Fish Resource (MassGIS 2021).

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 Pearl Hill have been designated Zone 2.

- All areas not identified as Zone 1 or 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 Pearl Hill are currently developed, appropriate for potential future development, or intensively used for recreation. They have been designated Zone 3.

- Facilities within existing altered footprint of the Park, consisting of the day use area, playing field, and campground.

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 Pearl Hill.

- **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 Pearl Hill 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).
- **Sensitive Rare Species Overlay.** Some developed portions of the Park that are in active use contain Priority Habitat for a reptile Species of Special Concern. This species is vulnerable to human disturbance and an Overlay has been created to indicate locations where recreation and/or maintenance activities may conflict with NHESP guidelines for this species.
- **Wellhead Protection Area Overlay.** This Overlay includes two Zone I Wellhead Protection Areas. Within this Overlay, activities should be consistent with Wellhead Protection Tips (MassDEP 1995) and MassDEP Guidance (MassDEP 2011).

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 Best Management Practices 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 Best Management Practices (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 23.)

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

Sixteen priority management recommendations were developed for this property. They are presented in Table 19, page 26. 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 CAMIS. The property manager should enter each recommendation listed in Table 19 (page 26) into CAMIS as a separate work order, noting "*RMP" in the description field. Non-traditional work orders (e.g., volunteer

trail work, posting of DPH Fish Consumption Advisory posters, certification of vernal pools) should be closed out by the property manager, once the recommendation has been implemented.

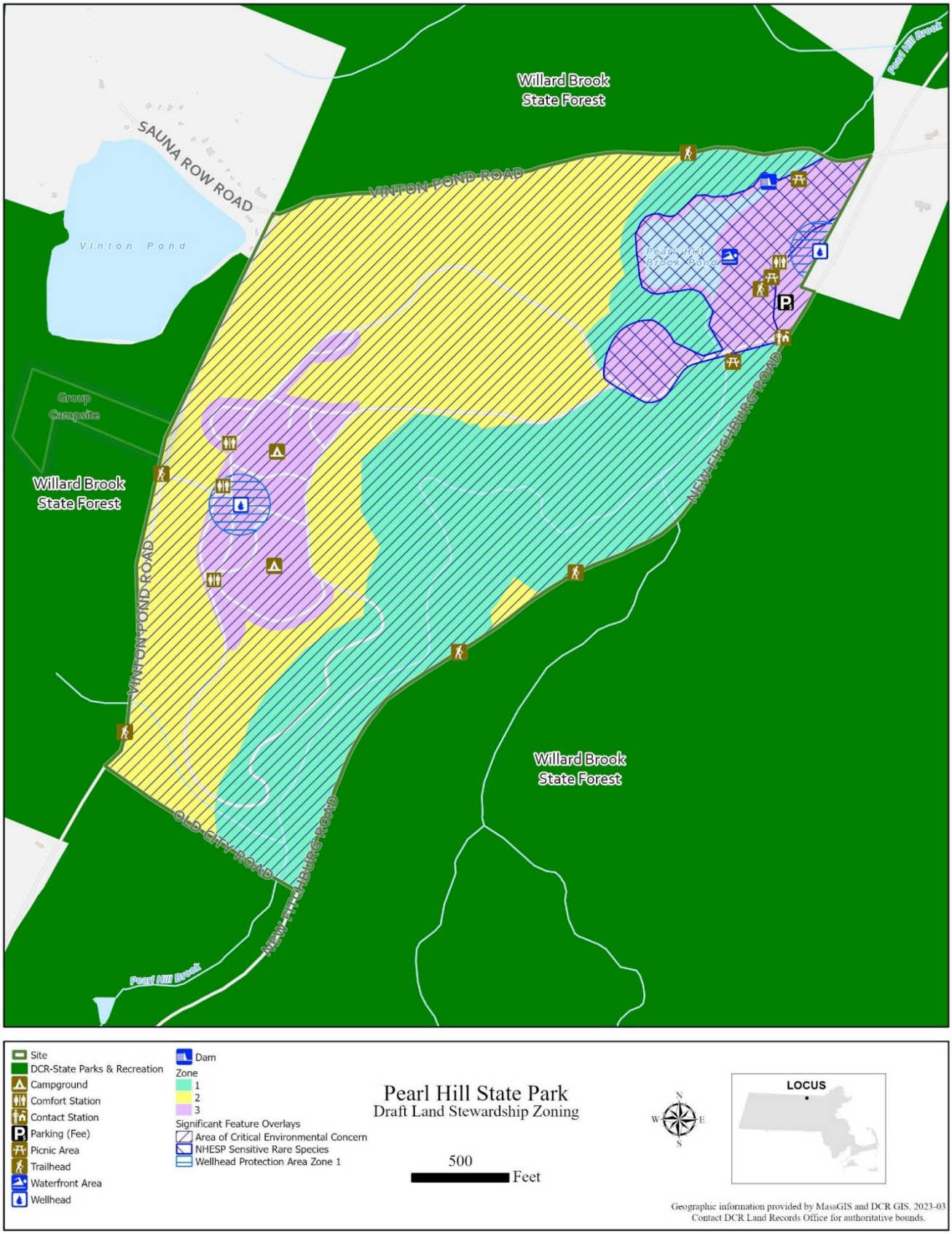

Figure 1. Land Stewardship Zoning Map.

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.	N/A
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.	N/A
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.	Yes
Natural Resources	5. The extent of exposed soil in campground and/or picnic sites is stable or decreasing.	No
Natural Resources	6. The extent of native vegetation in campground and/or picnic sites is stable or increasing. (As assessed by property manager.)	No
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.	No

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.	Yes
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.	Yes
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.	N/A
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.	Unknown
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.	Unknown
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 2019) 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.)	N/A
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.)	No
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.	N/A
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).	N/A

Table 19. Priority Recommendations for Pearl Hill State Park. 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	Following appropriate review and permitting, remediate each wetland and stream crossing and any associated erosion with new bridges or walkways.	Park Operations, Trails and Greenways Section (Lead)
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.	Management Forestry, Office of Natural Resources (Lead), Park Operations, Partner
Natural Resources	Implement necessary steps to protect habitat for the Massachusetts Endangered Species Act-protected Species of Special Concern in the Park, including: • Posting visitor signage to educate the public about species protection. • In consultation with the Natural Heritage & Endangered Species Program's State Herpetologist, review and modify, as needed, any Park maintenance or other work activities, possibly including dam operations, which impinge on the species' behavior or habitat.	Office of Natural Resources (Lead), Park Operations, Partner
Natural Resources	Review and implement MassDEP Wellhead Protection Tips and Guidance (MassDEP 1995, MassDEP 2011) within the Park's two Zone I Wellhead Protection Areas.	Consultant, Facilities Engineering (Lead), Park Operations
Natural Resources	Take steps to remediate native vegetation loss and soil erosion in the campground and picnic areas.	Park Operations
Recreation	Conduct requisite study(ies) and permitting for and implement project(s) to improve the waterfront area by replenishing beach sand and removing aquatic vegetation and impounded sediments at Pearl Hill Brook Pond.	Consultant, Contractor, Lakes and Ponds Program (Lead), Park Operations

Category	Recommendation	Implementation
Recreation	Conduct requisite study(ies) and permitting for and implement project(s) to abate bacterial loads in Pearl Hill Brook Pond and/or Pearl Hill Brook for the purposes of increasing visitor safety and swimming access, as well as improving waterbody health (Department of Environmental Protection 2012: 33).	Consultant, Contractor, Lakes and Ponds Program (Lead)
Recreation	Establish electronic infrastructure and signage so visitors to the day use area may pay parking fees via a contactless method.	Park Operations
Recreation	Replace critical trail bridge over Pearl Hill Brook on the Friends Loop Trail.	Park Operations, Trails and Greenways Section (Lead)
Recreation	Using DCR trails Best Management Practices (BMPs) (DCR n.d.), identify opportunities to harden or reroute existing trails in areas where trail use has resulted in erosion. Consider inviting New England Mountain Bike Association to partner with the Park for this purpose.	Park Operations, Trails and Greenways Section (Lead), Volunteers
Recreation	Develop and install a Welcome Wayside in the day use area kiosk.	Interpretive Services (Lead), Park Operations
Recreation	Complete studies for and install pavilion and playground.	Landscape Architecture Section
Recreation	Implement Key Recommendations from the 2022 Program Accessibility Assessment (IHCD 2022).	Architecture Section, Universal Access Program (Lead), Contractors, Facilities Engineering
Recreation	Work with ReserveAmerica to enforce the 14-day campground limit and associated alert system.	Camping Program (Lead), Contractor, Ranger Services
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.	Park Operations

Category	Recommendation	Implementation
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.	Management Forestry, Office of Natural Resources, Park Operations (Co-Lead), Partners, Trails and Greenways Section (Co-Lead)

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