

Proposal for a Middlesex Fells Reservation

Patch Reserve System

1 November 2010

Bryan T. Hamlin & Walter T. Kittredge

Richard K. Sullivan, Jr., Commissioner
Department of Conservation and Recreation
251 Causeway Street, Suite 600
Boston MA 02114

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Dear Commissioner Sullivan,

We would like to take this opportunity to submit for your consideration the following proposal, as such public input is stated to be an important component of the Forest Futures Visioning Process:

"The public must be involved in the process for DCR land allocation within the three zone model. The general public is highly invested in the management regimes of its land, and expects to have the opportunity to provide input in decisions about how a valued state property is classified. Opportunities to help identify 'Special Places' and patch reserves will also be highly valued." Forest Futures Visioning Process Recommendations of the Technical Steering Committee. Final Report, April 21, 2010

As scientists who have studied this area for over a decade, we hereby identify and nominate the entire Middlesex Fells Reservation to be classified as a Patch Reserve System for the Boston Basin Ecoregion, under the provisions of the Forest Futures Visioning Process. With a Resource Management Plan for the Fells imminent it is imperative that the Stewardship Council consider this timely opportunity to protect the natural and cultural resources of the Reservation for future generations. Documentation follows supporting this proposal.

Sincerely,

Bryan T. Hamlin, PhD.
56 Wyman Street
Medford, MA 02155
781 395 7722
bryanthamlin@gmail.com

Walter T. Kittredge
11 Batchelder Avenue
North Reading, MA 01864
978-664-5603
kittredg@oeb.harvard.edu

Cc.

Kathy Abbott, Executive Vice President
The Trustees of Reservations

Ian A. Bowles, EOEI Secretary
Exec. Office of Energy & Environmental Affairs

Bill Brumback, Conservation Director
New England Wild Flower Society

Matt Burne, Vice-president
Vernal Pool Association

Valerie J. Burns, President
Boston Natural Areas Network

Laurie Burt, Commissioner
MA Department of Environmental Protection

Dr. David Cash, Assistant Secretary for Policy
Exec. Office of Energy & Environmental Affairs

Christine Clarke, State Conservationist
USDA Natural Resources Conservation Service

Heather Clish, Deputy Director of Conservation
Appalachian Mountain Club

Conrad Crawford, Director of Partnerships
Department of Conservation and Recreation

Muriel Doherty, Office Manager
Stoneham Board of Selectmen

Robert Dolan, Mayor
Melrose City Hall

Dan Driscoll, Senior Project Manager
Department of Conservation and Recreation

Eleanor Fort, Preservation Advocate
Environment Massachusetts

Dr. David R. Foster, Director
Harvard Forest

Nancy Goodman, Vice President for Policy
The Environmental League of Massachusetts

Nicholas Gove, North Region Supervisor
Department of Conservation and Recreation

Mary B. Griffith, Commissioner
Massachusetts Department of Fish and Game

Lynn Harper, Habitat Protection Specialist
Natural Heritage & Endangered Species Program

Sharl Heller
The MA Forest & Park Friends Network

Richard C. Howard, Mayor
City of Malden

Thomas R. Howley, Chair
Board of Selectmen

Paul Jahnige, Director of Greenways & Trails
Department of Conservation and Recreation

EkOngKar Singh Khalsa, Executive Director
Mystic River Watershed Association

Frederick A. Laskey, Executive Director
Massachusetts Water Resources Authority

Henry Lee, Council Leader
DCR Stewardship Council

Wayne F. MacCallum, Director
Division of Fisheries & Wildlife

Jay McCaffrey, Chapter Director
Massachusetts Chapter Sierra Club

Michael J. McGlynn, Mayor
City of Medford

Elizabeth McGuire, District Administrator
Middlesex Conservation District

Dr. Les Mehrhoff, Curator
New England Botanical Club

Joe Orfant, Director of Planning & Resource Management
Department of Conservation and Recreation

Samantha Overton, Deputy Director
Division of Urban Parks & Recreation

Franklin A. Reece, Executive Director
Urban Ecology Institute

E. Heidi Ricci, Senior Policy Analyst
Mass Audubon

Jessica Rowcroft, Preservation Planner
Department of Conservation and Recreation

Mike Ryan, Executive Director
Friends of the Middlesex Fells Reservation

John Scanlon, Forest Project Leader
Division of Fisheries & Wildlife

Patricia C. Swain, Community Ecologist,
Natural Heritage & Endangered Species Program

Thomas M. Walsh, Fells District Manager
Department of Conservation and Recreation

Proposal for a Middlesex Fells Reservation Patch Reserve System

The Middlesex Fells occurs in the Mystic River Watershed in the Boston Basin Ecoregion (see locus map), which is under great threat of biodiversity loss because most of it has already been heavily developed. Less than 20% of the land is wooded, and it also has the fewest acres of protected open space of any of the ecoregions in Massachusetts. Within this region the Fells was designated as a Reservation in 1894, with the intent that it be preserved as a Nature Reserve for public recreation. It has been maintained as such for 116 years, during which time the Fells has continuously been an unmanaged, uncut, self-regulating Wildland ecosystem. The Fells differs significantly from the other DCR Urban Parks in its ecological richness and integrity. The Fells ecosystem accomplishes the goals for Wildlands set out in Woodlands and Wildlands (Foster et al., 2005) to “promote natural landscape level processes”, “protect water supplies¹”, “provide opportunities for scientific study²”, and “to afford special educational³, recreational, aesthetic and spiritual experiences.”

The Fells has a very diverse and complex terrain which is geologically based on the volcanic, plutonic, and metasedimentary bedrocks of the Avalon Terrane, a separate volcanic arc that accreted to coastal New England due to continental drift. This complex geology and terrain contributes to a diverse landscape mosaic of thirty habitats, including 9 Priority (see map), and a very high level of biodiversity with many rare and endangered plants and animals (see listing). All these factors contribute to almost the entire Fells Reservation being designated as Core Habitat on the Bio Maps, “which identify the areas most in need of protection in order to protect the native biodiversity of the Commonwealth,” and the entire southern half being designated as Priority Habitat. The Fells is also listed as a Recognized Important Bird Area by the Audubon Society (Categories 2 and 3) for its high diversity and density of breeding and migrating birds. This is a critical stepping-stone refuge for species that will need to migrate northward in the coastal zone due to climate change.

A major objective of the MA Division of Fish and Wildlife’s (MDFW) Comprehensive Wildlife Conservation Strategy (CWCS) is to “strive to achieve an equitable distribution of biologically viable conservation lands at all topographic elevations and across all ecoregions.” Likewise, the Department of Conservation and Recreation’s (DCR) Forest Future Visioning Process (FFVP) recommends that, “An expansive network of smaller ‘patch’ reserves, designed to protect other ecologically sensitive or culturally⁴ significant sites, will complement the system of large forest reserves. Reserves will be distributed widely across the state . . .” With over 150 priority habitats spread across the entire Reservation, there are very few places where there aren’t ecologically sensitive resources in the Fells. These priority habitats are embedded in a matrix of habitats which supports them, and without which they would cease to exist. Vernal Pools especially, as the most abundant priority habitat, depend entirely on the hydrology of intact undisturbed adjacent habitats for their water supply. Climate change will undoubtedly have adverse impacts on Vernal Pools, which would be mitigated by careful conservation of their supporting habitats. The only way to protect so many sensitive and widespread resource areas on such a large scale, would be to protect the entire Reservation as a Patch Reserve System.

Footnotes:

1. Water Protection: MWRA Fells and Spot Pond Reservoirs, and three Town of Winchester Reservoirs.

2. Scientific study: The Deane flora of 1896 provides a unique baseline for further studies:

- Deane, W. 1896. Flora of the Blue Hills, Middlesex Fells, Stony Brook and Beaver Brook reservations, of the Metropolitan Park Commission, Massachusetts. Boston: C. M. Barrows.
- Drayton, B. & Primack, R. B. 1996. Plant Species Lost in an Isolated Conservation Area in Metropolitan Boston from 1894 to 1993. *Conservation Biology* 10: 30-39.
- Hamlin, B. T., Kittredge, W. T., Lubin, D. P. & Wright, E. B. 2011 (in press). Changes in the Vascular Flora of the Middlesex Fells Reservation. *Rhodora*.

Brown, D. 2009. Middlesex Fells Reservation Mammals & their Habitats. Boston: MA DCR

Bulmer, M. S. & Traniello, J. F. A. 2002. Foraging Range Expansion and Colony Genetic Organization in the Subterranean Termite *Reticulitermes flavipes* (Isoptera: Rhinotermitidae) *Environ. Entomology* 31(2):293-8.

Burne, M. 2010+. Vernal Pool Association, Peabody, MA. Ongoing research and certification of Vernal Pools.

Oswald, Wyatt. 2010+. Emerson College, Boston, MA. Ongoing research on Pitch Pine dendrochronology.

Skehan, J. W. 1975. Puddingstone, Drumlins, and Ancient Volcanoes. Boston: Boston College

3. Educational: The Friends of the Fells in conjunction with DCR provides a full suite of educational lectures and hikes. There are two Nature Trails plus one in preparation. The Fells provides a free outdoor natural history classroom for over 21,000 schoolchildren in the five Fells towns, and for the 75 Colleges in the Boston area.

4. Cultural: Levin, E. & Mahlstedt, T. 1990. Middlesex Fells Reservation Historic Land-Use Study. Boston: Metropolitan District Commission Cultural Resource Management Study Series No. 1.

HABITAT DOCUMENTATION

Massachusetts Division of Fisheries and Wildlife. 2006. 2005 Massachusetts Comprehensive Wildlife Conservation Strategy. Draft plan. Massachusetts Division of Fisheries & Wildlife, Department of Fish and Game, Executive Office of Environmental Affairs, Westborough, MA.

“Chapter Six: Key Species and Habitats in Greatest Need of Conservation
B. Habitats of Species in Greatest Need of Conservation

As noted above in Methodology, this Comprehensive Wildlife Conservation Strategy examines the species in greatest need of conservation in terms of their general habitat type. These general habitats are listed below.”

(NB: Over half of these habitats are found in the Middlesex Fells Reservation and are in **bold**, with underlined habitats being particularly highly represented .)

“LARGE-SCALE HABITATS:

Upland Forest, Shrub Swamps, Lakes & Ponds, Grasslands, Young Forests and Shrublands, Riparian Forest, Vernal Pools, Coastal Plain Ponds, Springs, Caves & Mines, Rock Cliffs, Ridgetops, Talus Slopes, Connecticut & Merrimack Mainstems, Large & Mid-sized Rivers, Marine & Estuarine Habitats, Large Unfragmented Landscape Mosaic, Pitch Pine/Scrub Oak

MEDIUM-SCALE HABITATS:

Small Streams, Forested Swamps, Salt Marsh, Coastal Dunes, Beaches, and Small Islands

SMALL-SCALE HABITATS:

Peatlands & Associated Habitats, Marshes & Wet Meadows, Rocky Coastlines, Similar Habitats”

MIDDLESEX FELLS RESERVATION HABITATS

(Hamlin et al. 2011 in press)

30 Total, **9 Priority**, 4 of which were not previously known to occur in the Boston Basin Ecoregion.

Almost the entire Fells Reservation is considered as Core Habitat on the Bio Maps, “which identify the areas most in need of protection in order to protect the native biodiversity of the Commonwealth.”

(Based on The Classification of the Natural Communities of Massachusetts, Swain & Kearsley, 2001. NHESP Priority natural communities in **bold**.)

PALUSTRINE COMMUNITIES (10, **3 Priority**)

Acidic Graminoid Fen (S3) 2 sites

Alluvial Red Maple Swamp (S3) 5 sites, not listed for Boston Basin Ecoregion, 2001

Deep Emergent Marsh (S4)

Deep Emergent/Submersed Lake/Pond Community

Inland Acidic Lakeshore/Pondshore (S4)

Red Maple Swamp (S5)

Shallow Emergent Marsh (S4)

Shrub Swamp (S5)

Wet Meadow (S4)

Woodland Vernal Pool (S3) 100+ sites

TERRESTRIAL COMMUNITIES (20, 6 Priority)

Acidic Rocky Summit and Rock Outcrop Community (S3-S4)
Black Oak-Scarlet Oak Forest (S3/S4)
Circumneutral Rocky Summit/Rock Outcrop Community (S2-3) 4 sites
Circumneutral Talus Forest (S3) 2 sites
Cultural Forest (Pine plantations)
Cultural Grasslands (S5)
Blast Rock Tailings
Dry Rich Acidic Oak Forest (S4)
Forest Seep Community (S4)
Hickory-Hop Hornbeam Forest/Woodland (S2) 7 sites, not listed for Boston Basin Ecoregion, 2001
Mixed Oak Forest (S5)
Northern Hardwoods-Hemlock-White Pine Forest (S5)
Oak-Hemlock-White Pine Forest (S5)
Oak-Hickory Forest (S4)
Red Oak-Sugar Maple Transition Forest (S4)
Rich Mesic Forest Community (S3) 1 site, not listed for Boston Basin Ecoregion, 2001
Ridgetop Pitch Pine/Scrub Oak Community (S2) 14+ SITES with 1000+ plants
Scrub Oak Shrubland (S1) 3 sites, not listed for Boston Basin Ecoregion, 2001
Successional Birch/Poplar Woodland (SWAP = Young Forest)
White Pine-Oak Forest (S5)

BIODIVERSITY DOCUMENTATION

Massachusetts List of Endangered, Threatened, Special Concern, Watch Listed and Conservation Concern Species occurring in the Middlesex Fells Reservation:

Invertebrates:

Frosted Elfin Butterfly - *Callophys irus* SC
Hentz's Red Belly Tiger Beetle - *Cicindela rufinervis hentii* T
American Clam Shrimp - *Limnadia lenticularis* SC (Burne, M. 2010)
Orange Sallow Moth - *Rhodoecia aurantingo* T
Oak Hairstreak Butterfly - *Satyrium formius* SC

Birds:

Sharp-shinned Hawk - *Accipiter striatus* SC
Grasshopper Sparrow - *Ammodramus savannarum* T
American Black Duck - *Anas rubripes* (Conservation Concern: At risk breeding species)
Ruffed Grouse - *Banasa umbellus* (Conservation Concern: Management Concern)
Broad-Winged Hawk - *Buteo platyterus* (Conservation Concern: Breeding Bird Survey decline)
Green Heron - *Butorides virescens* (Conservation Concern: Breeding Bird Survey decline)
Northern Harrier - *Circus cyaneus* T
Prairie Warbler - *Dendroica discolor* (Conservation Concern: Partners in Flight Tier 1)
Blackpoll Warbler - *Dendroica striata* SC
Peregrine Falcon - *Falco peregrinus* E
American Kestrel - *Falco sparverius* (Conservation Concern: Breeding Bird Survey decline)
Common Loon - *Gavia immer* SC
Bald Eagle - *Haliaeetus leucocephalus* E
Wood Thrush - *Hylocichla mustelina* (Conservation Concern: Partners in Flight Tier 1)
Mourning Warbler - *Oporornis philadelphia* SC
Northern Parula - *Parula americana* T
Eastern Towhee - *Pipilo erythrophthalmus* (Conservation Concern: Breeding Bird Survey decline)
Vesper Sparrow - *Pooecetes gramineus* T
American Woodcock - *Scolopax minor* (Conservation Concern: Management Concern)
Louisiana Waterthrush - *Seiurus motacilla* (Conservation Concern: NE F&W Agencies)

Field Sparrow - *Spizella pusilla* (Conservation Concern: Breeding Bird Survey decline)
Brown Thrasher - *Toxostoma rufum* (Conservation Concern: Breeding Bird Survey decline)
Golden-winged Warbler - *Vermivora chrysoptera* E
Blue-winged Warbler - *Vermivora pinus* (Conservation Concern: Partners in Flight Tier 1)
White-throated Sparrow - *Zonotricha albicollis* (Conservation Concern: Breeding Bird Survey decline)

Fish:

Swamp Darter - *Etheostoma fusiforme* PI (Conservation Concern: Pollution Intolerant)
MCZ database, Harvard University

Mammals:

Bobcat - *Lynx rufus* (Conservation Concern: Large Home Range)

Reptiles:

Eastern Ribbon Snake - *Thamnophus sauritis* (Conservation Concern: NE F&W Agencies)
MCZ database, Harvard University

Vascular Plants:

Black Maple - *Acer nigrum* SC
White Snakeroot - *Ageratina altissima* WL
River Birch - *Betula nigra* WL
Mapleleaf Goosefoot - *Chenopodium simplex* WL
Pink Tickseed - *Coreopsis rosea* WL
Large-bracted Tick Trefoil - *Desmodium cuspidatum* T
Featherfoil - *Hottonia inflata* WL
Violet Bush Clover - *Lespedeza frutescens* (violacea auct.) WL
Lion's Foot - *Nabalus serpentarius* E
Rock Knotweed - *Polygonum tenue* WL
Allegheny Buttercup – *Ranunculus allegheniensis* WL
Early Buttercup - *Ranunculus fascicularis* WL

Total Native Vascular Plant Taxa: 580+

Rare native plant taxa found in only one or two areas: 167 (29%)

Hamlin, B. T. et al. 2011 (in press)

Total Lichen Taxa: 100+

Greene, D. & Kneiper, E. 2010 (in Hamlin et al. 2011, in press)

Total Bird Taxa: 178+

Jewell, D., Jewell, I. & Rines, M. 1995-2009 (unpublished)

Total Mammal Taxa: 23+

Brown, D. 2009

Complete lists of these taxa are available on request.

SUMMARY

The first recommendation of the Forest Futures Visioning Plan states that “The adoption and prioritization of ecosystem services is intended, in part, to address conflicts inherent in competing demands on our forests. *Essential ecosystem services* represent primary management goals for DCR lands. These include biodiversity protection, clean water, carbon sequestration, soil formation and nutrient cycling, and public recreation ...” Within this framework the FFVP further states that Patch Reserves “ would be areas where standard best management practices for the land-use zone are not adequate to fully protect these embedded areas (e.g., highly sensitive ecological or cultural assets within any of the three zones. . .”

With its great diversity of terrain, habitats, animals, and plants, so many of which are rare, the Fells Wildland ecosystem presents the state’s conservation agencies with a unique opportunity to protect a very large number of sensitive embedded habitats and species. This large 2500 acre forest also provides significant ecosystem services for the Boston area in the form of water supply protection for public reservoirs, and pollution mitigation through carbon sequestration. In addition, the Fells contains numerous cultural assets of great historical interest including building such as Wrights and Bear Hill Towers, the Tudor Barn and Botume House in the Middlesex Fells Reservoirs Historic District, the Spot Pond Brook Archeological District, the Quigley Quarries in the Medford Dike, the Silver Mine, the trolley line Trestle Bridge, the MIT Observatory site, the Middlesex Fells Reservation Parkways, which are on the National Register of Historic Places, and the many smaller constructions of the Civilian Conservation Corps (CCC) and the Works Progress Administration (WPA).

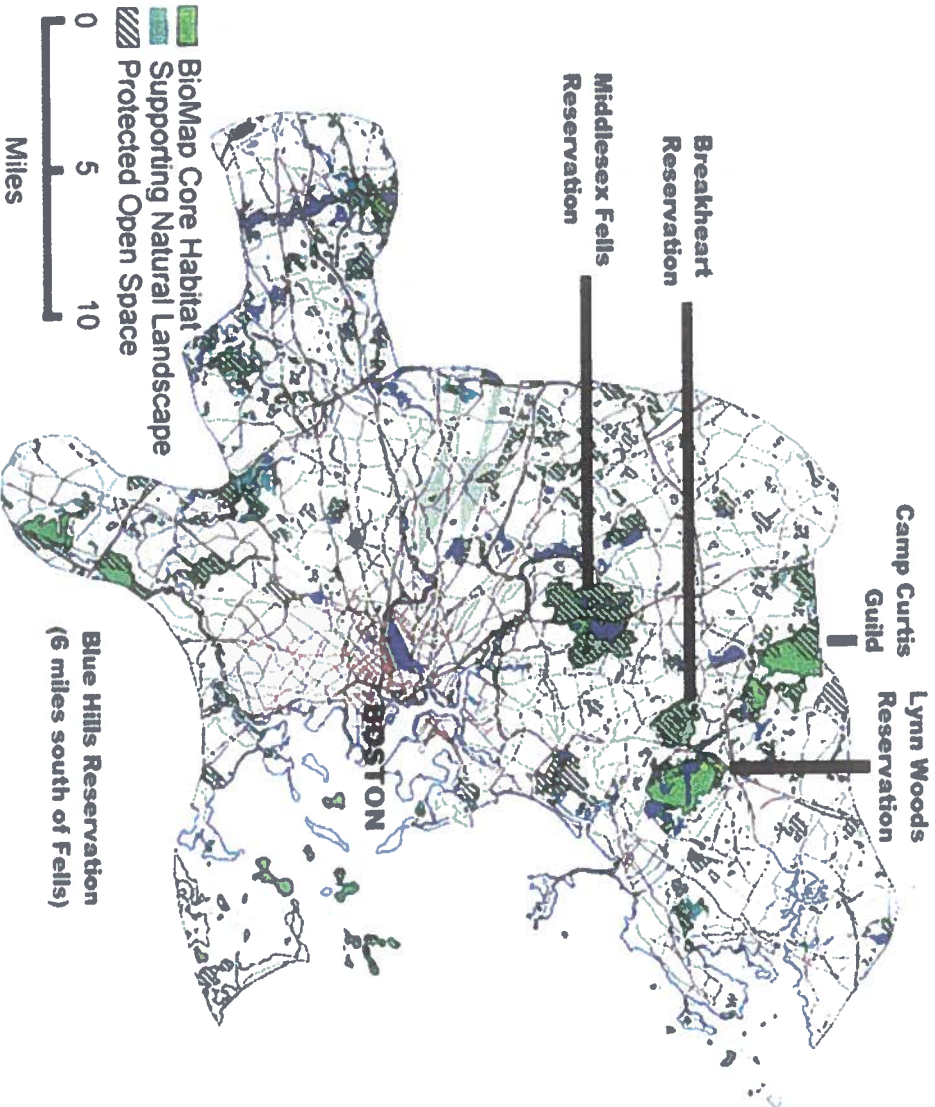
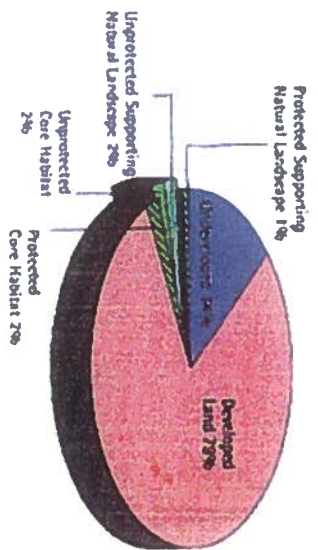
According to the State Wildlife Action Plan, “MDFW works with other Massachusetts resource agencies to implement the Comprehensive Wildlife Conservation Strategy.” The DCR Forest Futures Visioning Plan provides the means for both state conservation agencies to simultaneously implement the recommendations of both the MDFW Action Plan for protecting rare wildlife and their habitats, and the DCR Visioning Process for protecting ecosystem services, rare habitats and plants, and significant cultural resources. The Fells, with its widespread and abundant natural and cultural resources, can fulfill the state’s mandate to preserve these resources across the state in all ecoregions.

The above documentation supports the entire Middlesex Fells Reservation being classified as a Patch Reserve System for the Boston Basin Ecoregion, to continue the state’s unbroken legacy of natural resource stewardship of this invaluable public property into the future.



BOSTON BASIN ECOREGION

**Harold Parker State Forest
(7.5 miles north of Fells)**



Map modified from Friends of the Alewife Brook Reservation website 2010

KEY
Priority Habitats

- Alluvial Red
- Maple Swamp
- Circumneutral
- Rocky Summit
- Circumneutral
- Talus Slope
- Hickory - Hop
- Hornbeam Forest
- Rich Mesic Forest
- Ridgetop Pitch
- Pine/ Scrub Oak
- Vernal Pool
- Vernal Pool
- Certified Vernal Pool

Map and Vernal Pool data from Matt Burne, Vernal Pool Association. Other habitat data from Walter Kittredge, Harvard Herbaria. 2010

