Appendix A

Contributors

Department of Conservation and Recreation

Andrew Backman, Director of Regional Planning
Paul Cavanagh, Resource Management Planner
Dan Driscoll, Director of Recreation Facilities Planning
Patrick Flynn, former Director, Division of Urban Parks and Recreation
Nicholas Gove, Acting North Region Director
Karl Haglund, Senior Planner
Leslie Luchonok, former Director, Resource Management Planning Program
Tom Mahlstedt, Archeologist, Office of Cultural Resources
Rene Morin, Fells District Regional Coordinator
William Morrissey, North Region Director
Samantha Overton, Deputy Director of the Division of Urban Parks and Recreation
Julia O'Brien, Chief Planner
Wendy Pearl, Office of Cultural Resources
Shaun Provencher, Office of Cultural Resources
Richard Thibedeau, former Resource Management Planning Program
Thomas Walsh, Fells District Manager

Pressley Associates

Marion Pressley, Principal
Lauren Meier, Project Manager
Swaathi Joseph, Landscape Designer
Christopher Beagan, Landscape Designer

LEC Environmental Consultants

Richard Kirby, Scientist

Other Contributors

Henry Lee, Stewardship Council Member, Chair of the Policy & Planning Committee

Plant Community Composition Source: LEC Environmental, Inc.

Upland Forest

Groundcover

Acer platanoides	Norway Maple
Acer saccharum	Sugar Maple
Alliaria officinalis	Garlic Mustard
Amemone quinquefolia	Wood Amemone
Aralia nudicaulis	Sarsaparilla
Betula lenta	Black Birch
Carya spp.	Hickory
Castanea dentata	American Chestnut
Cheladonium majus	Celandine Poppy
Convallaria majalis	Lily-of-the-Valley
Dennstaedtia punctilobula	Hay-scented Fern
Dryopteris sp.	Wood Fern
Erythronium americanum	Trout Lily
Fagus grandifolia	American Beech
Fraxinus americana	Green Ash
Lonicera tatarica	Tatarian Honeysuckle
Lycopodium obscurum	Tree Clubmoss
Maianthemum canadense	Canada Mayflower
Pinus strobus	Eastern White Pine
Prunus serotina	Black Cherry
Pteridium aquilium	Braken Fern
Quercus alba	White Oak
Quercus rubra	Northern Red Oak
Quercus velutina	Black Oak
Rhamnus cathartica	Common Buckthorn
Rhamnus frangula	European Buckthorn
Smilacina racemosa	False Solomon's Seal
Trientalis borealis	Star Flower
Vaccinium angustifolium	Low-Bush Blueberry
Viburnum acerifolium	Maple-leaf Viburnum
Viola spp.	Violets

Shrub and Sapling Layer

Acer platanoides	Norway Maple
Berberis thunbergii	Japanese Barberry
Castanea dentata	American Chestnut
Lonicera tatarica	Tatarian Honeysuckle
Rhamnus cathartica	Common Buckthorn
Rhamnus fragula	European Buckthorn
Rosa multiflora	Multiflora Rose
Viburnum acerifolium	Maple-leaf Viburnum

Canopy

Acer saccharum	Sugar Maple
Betula lenta	Black Birch
Carya spp.	Hickory
Fagus grandifolia	American Beech
Fraxinus americana	Green Ash
Pinus strobus	Eastern White Pine
Prunus serotina	Black Cherry
Quercus alba	White Oak
Quercus rubra	Northern Red Oak
Quercus velutina	Black Oak

Wet Meadow

Groundcover

Carex spp.	Sedges
Juncus spp.	Rushes
Lythrum salicaria	Purple Loosestrife
Phalaris arundinacea	Reed Canary Grass
Typha latifolia	Cattail

Upland Meadow

Canopy

Picea abies	Norway Spruce

Groundcover

Achillea millefolium	Yarrow
Agropyron repens	Quackgrass
Asclepias spp.	Milkweed
Festuca sp.	Fescue Grass
Hypericum spp.	St. John's Wort
Leucanthemum vulgare	Oxeye Daisey
Phleum pratense	Timothy Grass
Plantago lanceolata	Lance-Leaved Plantain
Plantago major	Common Plantain
Silene latiflora	White Campion
Tragopogon pratensis	Hawkweed

Successional Shrub Habitat

Shrubs and Sapling Layer

Acer platanoides	Norway Maple
Acer saccharum	Sugar Maple
Alnus rugosa	Speckled Alder
Betula lenta	Black Birch
Carya spp.	Hickory
Castanea dentata	American Chestnut
Celastrus orbiculatus	Oriental Bittersweet
Cornus amomum	Silky Dogwood
Cornus florida	Flowering Dogwood
Cornus racemosa	Gray Dogwood
Elaeagnus umbellata	Autumn Olive
Fagus grandifolia	Beech
Fraxinus americana	Green Ash
Gleditsia triacanthos	Honey Locust
Juniperus virginiana	Red Cedar
Lonicera tatarica	Tatarian Honeysuckle
Pinus strobus	Eastern White Pine
Poplar spp.	Poplar
Prunus serotina	Black Cherry
Quercus alba	White Oak
Quercus rubra	Northern Red Oak
Quercus velutina	Black Oak
Rhamnus cathartica	Common Buckthorn
Rhamnus frangula	European Buckthorn
Rhus typhina	Staghorn Sumac
Robinia pseudoacacia	Black Locust
Rosa multiflora	Multiflora Rose
Spirea latifolia	Meadowsweet

Groundcover

Barbarea vulgaris	Yellow Rocket
Daucus carota	Wild Carrot
Plantago lanceolata	Lance-Leaved Plantain
Plantago major	Common Plantain
Polygonum sp.	Polygonum
Solidago spp.	Goldenrod
[GRAMINEAE]	Grasses

Forested Wetlands

Canopy

Acer rubrum	Red Maple
Fraxinus pennsylvanica	Green Ash
Ulmus americana	American Elm

Shrub

Clethra alnifolia	Sweet Pepperbush
Cornus amomum	Silky Dogwood
Ilex verticillata	Winterberry Holly
Lindera benzoin	Spicebush
Rhamnus frangula	European Buckthorn
Rhododendron vuscosum	Swamp Azalea
Vaccinium corymbosum	Highbush Blueberry
Viburnum dentatum	Arrowwood

Groundcover

Arisaema triphyllum	Jack-in-the-Pulpit
Carex spp.	Sedges
Geranium maculatum	Wild Geranium
Juncus spp.	Rushes
Kalmia angustifolia	Sheep Laurel
Onoclea sensibilis	Sensitive Fern
Osmunda cinnamomea	Cinnamon Fern
Osmunda claytoniana	Interupted Fern
Symplocarpus foetidus	Skunk Cabbage
Toxicodendron radicans	Poison Ivy

Emergent Marsh

Groundcover

Carex spp.	Sedges
Juncus spp.	Rushes
Lythrum salicaria	Purple Loosestrife
Phalaris arundinacea	Reed Canary Grass
Solidago spp.	Goldenrod
Typha latifolia	Cattail

Potential and Actual Wildlife Utilization

Source: LEC Environmental, Inc.

Upland Forest

Mammals	
Canis latrans	Coyote
Eptesicus fuscus	Big Brown Bat
Erethizon dorsatum	Porcupine
Lasiurus borealis	Eastern Red Bat
Martes pennanti	Fisher
Mustela spp.	Weasel
Odocoileus virginianus	White-Tailed Deer *
Parascalops breweri	Hairy-Tailed Mole
Peromyscus leucopus	White-Footed Mouse *
Sciurus carolinensis	Gray Squirrel *
Tamias striatus	Chipmunk *
Tamiasciurus hundsonicus	Red Squirrel
Urocyon cinereoargenteus	Gray Fox

Reptiles	
Clemmys guttata	Spotted Turtle
Diadophis punctatus	Northern Ring-Neck Snake
Thamnophis sauritus	Eastern Ribbon Snake

Amphibians	
Ambystoma laterale	Blue-Spotted Salamander
Ambystoma maculatum	Spotted Salamander
Ambystoma opacum	Marbled Salamander
Hyla crucifer	Spring Peeper
Rana clamitans	Green Frog
Rana palustris	Pickerel Frog
Rana sylvatica	Wood Frog *

Birds	
Accipiter cooperii	Cooper's Hawk
Accipiter gentilis	Northern Goshawk
Bubo virginianus	Great Horned Owl
Cardinalis cardinalis	Northern Cardinal *
Catharus guttatus	Hermit Thrush *
Colaptes auratus	Northern Flicker *
Contopus virens	Eastern Wood Pewee *
Corvus spp.	Crow *
Cyanocitta cristata	Blue Jay *
Empidonax minimus	Least Flycatcher
Hylocichla mustelina	Wood Thrush *
Junco hyemalis	Dark-Eyed Junco
Meleagris gallopavo	Wild Turkey
Mniotilta varia	Black and White Warbler *
Myiarchus crinitus	Great-Crested Flycatcher *
Parus atricapillus	Black-Capped Chickadee *
Parus bicolor	Tufted Titmouse *
Pheucticus ludovicianus	Rose-Breasted Grosbeak *
Picoides pubescens	Downy Woodpecker *
Picoides villosus	Hairy Woodpecker
Pipilo erythrophthalmus	Eastern Towhee
Piranga olivacea	Scarlet Tanager
Scolopax minor	American Woodcock
Seiurus aurocapillus	Ovenbird *
Sitta corolinensis	White-Breasted Nuthatch *
Turdus migratorius	American Robin *
Vireo olivaceus	Red-Eyed Vireo *
Wilsonia canadensis	Canada Warbler

** Species was observed, heard, or evident via sign*

Potential and Actual Wildlife Utilization continued

Forested Wetlands	
Mammals	
Blarina brevicauda	Short-Tailed Shrew
Condylura cristata	Star-Nosed Mole
Mustela spp.	Weasel
Napaeozapus insignis	Woodland Jumping Mouse
Birds	
Archilochus colubris	Ruby-Throated Hummingbird *
Buteo lineatus	Red-Shouldered Hawk
Buteo platypteris	Broad-Winged Hawk
Butorides virescens	Green Heron
Catharus fuscescens	Veery *
Dumetella carolinensis	Catbird *
Empidonax minimus	Least Flycatcher
Geothylptis trichas	Common Yellowthroat
Nycticorax nycticoax	Black-Crowned Night Heron
Otus asio	Eastern Screech Owl
Parula americana	Northern Parula
Polioptila caerulea	Blue-Gray Gnatcatcher
Sayornis phoebe	Eastern Phoebe *
Seiurus noveboracensis	Northern Waterthrush *
Strix varia	Barred Owl
Thtyothorus ludovicianus	Carolina Wren *
Troglodytes troglodytes	Winter Wren
Reptiles	
Clemmys guttata	Spotted Turtle
Diadophis punctatus	Northern Ring-Neck Snake
Thamnophis sauritus	Eastern Ribbon Snake
Amphibians	
Ambystoma laterale	Blue-Spotted Salamander
Ambystoma maculatum	Spotted Salamander
Ambystoma opacum	Marbled Salamander
Hyla crucifer	Spring Peeper
Rana clamitans	Green Frog
Rana palustris	Pickerel Frog
Rana sylvatica	Wood Frog *
** Species was observed, heard, or evident via sign*	

Mill Pond and Duck Pond	
Mammals	
Eptesicus fuscus	Big Brown Bat
Lasionycteris noctivagans	Silver-Haired Bats
Lasiurus borealis	Eastern Red Bat
Lasiurus cinereus	Hoary Bat
Birds	
Aix sponsa	Wood Duck *
Anas platyrhynochos	Mallard *
Anas rubripes	Black Duck *
Anas spp.	Teal
Branta canadensis	Canada Goose *
Ceryle alcyon	Belted Kingfisher
Chen caerulescens	Snow Goose *
Lophodytes cucullatus	Hooded Merganser
Parula americana	Northern Parula
Polioptila caerulea	Blue-Gray Gnatcatcher
Sayornis phoebe	Eastern Phoebe *
Vireo gilvus	Warbling Vireo
Reptiles	
Chelydra serpentina	Snapping Turtle
Chrysemys picta	Painted Turtle
Amphibians	
Notophthalmus viridescens	Red-Spotted Newt
Rana catesbeiana	Bull Frog
Rana clamitans	Green Frog
Arthropods	
[DIPTERA]	Mosquitos *
[ODONATA]	Odonates *
** Species was observed, heard, or evident via sign*	

Potential and Actual Wildlife Utilization continued

Successional Shrub Habitat and Meadow Habitats

Birds	
Agelaius phoeniceus	Red-Winged Blackbird
Archilochus colubris	Ruby-Throated Hummingbird*
Bombycilla cedrorum	Cedar Waxwing
Buteo jamaicensis	Red-Tailed Hawk
Caprimulgus vociferus	Whip-Poor-Will
Carduelis tristis	American Goldfinch *
Cathartes aura	Turkey Vulture
Chaetura pelagica	Chimney Swift
Chordeilis minor	Common Nighthawk
Circus cyaneus	Northern Harrier
Coccyzus erythropthalmus	Black-Billed Cuckoo
Dumetella carolinensis	Catbird *
Eremophila alpestris	Horned Lark
Falco sparverius	American Kestrel
Icterus galbula	Baltimore Orioles *
Lanius excubitor	Northern Shrike
Mimus polyglottos	Northern Mockingbird
Molothrus ater	Brown-Headed Cowbird
Nyctea scandiaca	Snowy Owl
Passerculus sandwichensis	Savannah Sparrow
Passerina cyanea	Indigo Bunting
Pheucticus ludovicianus	Rose-Breasted Grosbeak *
Quiscalusquiscula	Common Grackle
Sialia sialis	Eastern Bluebird
Spizella arborea	Winter Sparrow
Spizella passerina	Chipping Sparrow
Thtyothorus ludovicianus	Carolina Wren *
Toxostoma rufum	Brown Thrasher
Turdus migratorius	American Robin *
Tyrannus tyrannus	Eastern Kingbird
Zenaida macroura	Mourning Dove *

Mammals	
Canis latrans	Coyote
Marmota monax	Woodchuck
Mephitis mephitis	Striped Skunk
Microtus pennsylvanicus	Meadow Vole
Mustela spp.	Weasel
Sylvilagus floridanus	Eastern Cottontail
Vulpes vulpes	Red Fox
Zapus hudsonius	Meadow Jumping Mouse

Reptiles	
Coluber constrictor	Black Racer
Lampropeltis triangulum	Milk Snake
Opheodrys vernalis	Smooth Green Snake
Thamnophis sirtalis	Common Garter Snake

Amphibians	
Bufo americanus	American Toad *
Hyla crucifer	Spring Peeper
Notophthalmus viridescens	Red-Spotted Newt
Rana clamitans	Green Frog
Rana palustris	Pickerel Frog
Rana sylvatica	Wood Frog *

** Species was observed, heard, or evident via sign*

Potential and Actual Wildlife Utilization continued

Emergent Marsh Habitat

Mammals	
Microtus pennsylvanicus	Meadow Vole
Ondatra zibethicus	Muskrat
Procyon lotor	Raccoon
Zapus hudsonius	Meadow Jumping Mouse
Birds	
Agelaius phoeniceus	Red-Winged Blackbird *
Ardea alba	Great Egret
Butorides virescens	Great Blue Heron
Cistothorus palustris	Marsh Wren
Egretta thula	Snowy Egret
Gallinago gallinago	Common Snipe
Gallinula chloropus	Common Moorhen
Geothylptis trichas	Common Yellowthroat *
Melospiza georgiana	Swamp Sparrow
Melospiza melodia	Song Sparrow
Nycticorax nycticoax	Black-Crowned Night Heron
Porzana carolina	Sora
Rallus limicola	Virginia Rail
Seiurus noveboracensis	Northern Waterthrush *
Tachycineta bicolor	Tree Swallow *
Reptiles	
Chrysemys picta	Painted Turtle
Clemmys guttata	Spotted Turtle
Nerodia sipedon	Northern Water Snake
Sternothaerus odoratus	Musk Turtle
Storeria dekayi	Brown Snake
Thamnophis sauritus	Eastern Ribbon Snake
Amphibians	
Hyla crucifer	Spring Peeper
Rana catesbeiana	Bull Frog
Rana clamitans	Green Frog
Rana palustris	Pickerel Frog

** Species was observed, heard, or evident via sign*

Flora and Fauna in Beaver Brook North Reservation

Source: MSH Reuse Plan

Flora	Fauna
Shrubs	*Reptiles and Amphibians*
Highbush Blueberry	American toad
Arrowwood	Wood frog
Hazelnut	Spring peeper
Dogwood	Green frog
Buckthorn	Red-backed salamander
Honeysuckle	Garter snake
	Snapping turtle
Ground cover	
Canada Mayflower	*Birds*
	Red-tailed hawk
Flowers	Great horned owl
Pinl Ladyslipper	Eastern wood peewee
True Solomon's Seal	Great crested flycatcher
False Solomon's Seal	Wood thrush
Windflower	Brown thrasher
Bellwort	Blue winged warbler
Wild Pink	Scarlet tananger
	Rose-breasted grosbeak
Trees	Indigo bunting
Oak	Solitary vireos
Hickory	
	Mammals
	Opossum
	Little brown bat
	Gray fox
	Red fox
	White-tailed deer
	Eastern chipmunk
	Short-tailed shrew
	Striped skunk
	Woodchuck
	Eastern cottontail
	Muskrat
	Weasel
	Raccoon

Appendix C

Land Stewardship Zoning Guidelines

This appendix contains the Department of Conservation and Recreation Land Stewardship Zoning Guidelines, dated February 2006

Background

In July, 2003 state legislation established the Department of Conservation and Recreation (DCR), consisting of a Division of Urban Parks and Recreation, a Division of State Parks and Recreation, and a Division of Water Supply Protection. This legislation essentially merged the former Department of Environmental Management (DEM) and the Metropolitan District Commission (MDC). In addition, the legislation required the preparation of management plans for state parks, forests and reservations under the management of the DCR (Chapter 21, Section 2F). This legislation states that management plans shall include guidelines for operation and land stewardship, provide for the protection and stewardship of natural and cultural resources, and shall ensure consistency between recreation, resource protection, and sustainable forest management.

As part of addressing this legislative requirement, land stewardship zoning guidelines will be incorporated into the development and implementation of DCR Resource Management Plans. These Land Stewardship Zoning Guidelines (Guidelines) represent a revision of the previous Land Stewardship Zoning system developed by Executive Office of Environmental Affairs (EOEA) agencies in the early 1990s, and which had been applied to the preparation of management plans for state parks, forests and reservations under the management of the former DEM.

The purpose of these revised Guidelines is to provide a general land stewardship zoning framework for the development of Resource Management Plans for all state reservations, parks and forests under the management of the DCR Divisions of Urban Parks and Recreation and State Parks and Recreation. The Guidelines do not apply to Division of Water Supply Protection (DWSP) properties because DWSP watershed planning has a separate legislative mandate and established planning procedures.

Overview of the Guidelines

The Guidelines define three types of zones to address the legislative requirement to provide for the protection and stewardship of natural and cultural resources and to ensure consistency between recreation, resource protection, and sustainable forest management. The Guidelines are intended to provide a general land stewardship zoning framework that is flexible and that can guide the long-term management of a given DCR property or facility. The three zones may be supplemented with significant feature overlays that identify specific designated/recognized resource features (such as Forest Reserves, Areas of Critical Environmental Concern, or areas subject to historic preservation restrictions). DCR parks, forests, and reservations are also subject to specific policy guidelines and/or performance standards (such as Executive Order No. 181 for Barrier Beaches) and applicable environmental laws and regulations of the Commonwealth.

Application of the three-zone system to a particular DCR park, forest or reservation is facilitated by the development and application of Geographic Information Systems (GIS) technology. GIS resource overlays provide a general screen whereby lands of special resource significance and sensitivity can be mapped and identified. General landscape features such as forested areas, wetlands, streams and ponds can also be mapped as part of this overlay approach. Further, additional data regarding recreational uses and developed facilities and sites can be added. This type of mapping and data collection, based on the best information currently available, provides the basis for subsequent analysis and ultimately the development and application of appropriate land stewardship zoning guidelines to a specific state park, forest or reservation.

Land Stewardship Zoning Guidelines provide a foundation for recommendations that will address resource stewardship and facility management objectives, and are intended to cover both existing DCR property or facility conditions and desired future conditions for

that property or facility. Proposals for changing the Guidelines in a previously approved Resource Management Plan should be submitted to the DCR Stewardship Council for review and adoption.

Land Stewardship Zones

Zone 1

General Description

This zone includes unique, exemplary, and highly sensitive resources and landscapes that require special management approaches and practices to protect and preserve the special features and values identified in the specific Resource Management Plan. Examples of these resources include rare species habitat identified by the Natural Heritage & Endangered Species Program as being highly sensitive to human activities, fragile archaeological or cultural sites, and unique or exemplary natural communities. Management objectives emphasize protecting these areas from potentially adverse disturbances and impacts.

General Management Guidelines

- Only dispersed, low-impact, non-motorized, sustainable recreation will be allowed provided that the activities do not threaten or impact unique and highly sensitive resources.

- Existing trails and roads will be evaluated to ensure compatibility with identified resource features and landscape, and will be discontinued if there are suitable sustainable alternatives. New trails may be constructed only after a strict evaluation of need and avoidance of any potential adverse impacts on identified resources. New roads may only be constructed to meet public health and safety needs or requirements; however, the project design and siting process must avoid any potential adverse impacts on identified resources and demonstrate that there are no other suitable alternatives.

- Vegetation or forest management will be utilized only to preserve and enhance identified resource features and landscapes.

Zone 2

General Description

This zone includes areas containing typical yet important natural and cultural resources on which common forestry practices and dispersed recreational activities can be practiced at sustainable levels that do not degrade these resources, and that hold potential for improving their ecological health, productivity and/or protection through active management. Examples include terrestrial and aquatic ecosystems characterized by a diversity of wildlife and plant habitats, rare species habitat that is compatible with sustainable forestry and dispersed recreation, agricultural resources, and resilient cultural sites and landscapes. Zone 2 areas may be actively managed provided that the management activities are consistent with the approved Resource Management Plan for the property.

General Management Guidelines

- Management approaches and actions may include a wide range of potential recreational opportunities and settings that are consistent and compatible with natural resource conservation and management goals.

- Utilize Best Management Practices for forestry and other resource management activities to encourage native biodiversity, protect rare species habitats and landforms.

- Protect and maintain water quality by providing for healthy functioning terrestrial and aquatic ecosystems.

- Provide a safe, efficient transportation network with minimal impact on natural and cultural resources while serving public safety needs and allowing visitors to experience a variety of outdoor activities.

- New trails may be allowed dependent upon existing area trail densities, purpose and need, physical suitability of the site, and specific guidelines for protection of rare species habitat and archaeological resources.

- Sustainable forest management activities may be undertaken following guidelines established through ecoregion-based assessments, district level forestry plans, current best forestry management practices, and providing for consistency with resource protection goals.

- Roads may be constructed if access for resource management or public access is needed and construction can be accomplished in an environmentally protective manner. Existing roads will be maintained in accordance with the DCR road classification system and maintenance policy.

- Additional site-specific inventory and analysis may be needed prior to any of the management activities described above to ensure that no adverse impacts occur to previously un-documented unique and sensitive resources and landscape features.

Zone 3

General Description

This zone includes constructed or developed administrative, maintenance and recreation sites, structures and resilient landscapes which accommodate concentrated use by recreational visitors and require intensive maintenance by DCR staff. Examples include areas developed and deemed appropriate for park headquarters and maintenance areas, parking lots, swimming pools and skating rinks, paved bikeways, swimming beaches, campgrounds, playgrounds and athletic fields, parkways, golf courses, picnic areas and pavilions, concessions, and areas assessed to be suitable for those uses.

General Management Guidelines

- The management approach and actions will emphasize public safety conditions and provide for an overall network of accessible facilities that meets the needs of DCR visitors and staff.

- Maintenance of these facilities and associated natural and cultural resources, and new construction or development, will meet state public health code, and state building code and environmental regulations.

- Shorelines and surface waters may be used for recreation within constraints of maintaining public safety and water quality.

- Historic restoration, rehabilitation or reconstruction for interpretation or adaptive reuse of historic structures will be undertaken only in conjunction with a historic restoration plan.

- To the greatest extent possible, construction will include the use of “green design” for structures, such as use of low-flow water fixtures and other water conservation systems or techniques, solar and other renewable energy sources, and the implementation of Best Management Practices to protect soil and water resources at all facilities.

Significant Feature Overlays

General Description

The three land stewardship zones may be supplemented with significant feature overlays that identify specific designated/recognized resource features. These significant features are generally identified through an inventory process or research, and are formally designated. The purpose of these overlays is to provide more precise management guidance for identified resources and to recognize, maintain, protect, or preserve unique and significant values, regardless of the zone in which they occur. Examples of significant feature overlays include Forest Reserves, areas subject to public drinking water regulations, or areas subject to historic preservation restrictions.

Management Guidelines

Specific management guidelines for significant features overlays are provided by resource specialists or by the federal, state, regional, or local agency that has recognized and listed the resource or site.

Appendix D

Public Comments and Revisions to the Public Review Draft RMP

This appendix contains the following materials:

- Overview of public participation process
- Summary of public comments on the public review draft RMP
- Substantive revisions to the RMP based upon additional DCR staff review
- Summaries of first and second public meetings

Overview of Public Participation Process

Public Meetings

A public meeting to present preliminary findings and solicit input on issues and topics to be addressed in the RMP was held in March 2006. Approximately thirty individuals representing the communities of Belmont, Lexington, and Waltham and organizations such as the Waltham Land Trust, Massachusetts Audubon Society, and the New England Mountain Bike Associate attended. Notice of the public meeting was provided through press releases to local media, letters to area legislators, and notices sent to several community groups via e-mail.

On May 10, 2006, the public review draft was posted on the DCR RMP website and a public notice published in the MEPA *Environmental Monitor*. Consistent with RMP legislation, Chapter 26 Acts of 2003, the draft was available for public comment for a 30-day period ending on June 9, 2006. Notice of the public review process, including the May 23, 2006 public meeting, was provided through press leases and an extensive mailing (both e-mail and U.S. post) to several community groups, municipal boards and commissions, and other interested parties.

The second public meeting held on May 23, 2006 presented the findings and recommendations of the draft RMP and solicited input and comments from the participants. Approximately twenty (20) individuals from the three communities and several stakeholder organizations attended the second public meeting. Thirty-eight (38) written comments were received through June 9, 2006, primarily by email. DCR and the consultant team evaluated all comments, and revised the draft plan in preparation for its presentation to the DCR Stewardship Council. The final draft plan was completed on June 30, 2006.

Overview of Public Comments and Substantive Changes to the RMP

(see also the Summary of Public Comments below for more detail)

Comments received in the May 23 public meeting and in written and email correspondence indicated clear consensus on several important issues. Most of the written comments were directed toward the future management and use of the Beaver Brook North Reservation as the reviewers and meeting attendees were generally pleased with the current management and condition of Beaver Brook Reservation, despite limited DCR staffing and operational resources. Several themes regarding the Beaver Brook North Reservation and its complex relationship with the other parcels formerly part of the Metropolitan State Hospital surfaced in the written comments and public meeting:

1.) There was general consensus and support for the future use of the Beaver Brook North Reservation focused on the conservation and stewardship of the property's significant natural and cultural resources, with provisions for passive recreation (prohibiting motorized vehicles), consistent with the general approach to the RMP.

2.) Many comments expressed concern about limiting mountain bicycles to the existing carriage road, rather than continuing their established use on the secondary [single track] trails. In response to this concern, DCR and the consultant team re-evaluated the secondary trails and revised the recommendations to continue mountain bike use on most trails. The only exception is the steep trail leading to the top of Mackerel Hill, where the straight alignment exacerbates erosion. There, additional work is needed to both more fully evaluate all of the Mackerel Hill trails and reroute them where necessary to address drainage and erosion issues to better accommodate shared use by both pedestrians and mountain bikes.

3.) The Metropolitan Parkway and its relationship to the AvalonBay residential development also raised considerable public comment. This relates to both general public understanding regarding the 1994 Metropolitan State Hospital Reuse Plan and amendments, concern regarding potential traffic impacts to both Trapelo Road and Concord Avenue, and the potential for encroachment into the reservation from the construction. The traffic issue is largely outside the jurisdiction of DCR and the RMP, as it relates to the Department of Capital Asset Management's (DCAM) construction of the parkway and their right to provide an emergency access road between the two parkway segments if the proposed golf course parking lot is not constructed by the City of Waltham.[1] However, the RMP does recommend coordinating with the three municipalities regarding traffic monitoring and mitigation.

4.) The last major comment raised concern about the alternative locations for a DCR visitor center and parking area in the Beaver Brook North Reservation near the Concord Avenue entrance. The alternative locations have been eliminated from the plan, with the DCR visitor center recommended in the former MSH Administration Building (owned by the City of Waltham) with a small reservation parking area nearby. This change is consistent with the 1994 MSH Reuse Plan.

Summary of Comments on the Public Draft RMP, DCR Responses, and Substantive Revisions to the RMP

DCR received 38 written comments on the draft RMP through email, fax and surface mail. A copy of all comments was provided to DCR by Pressley Associates, who managed the email responses for DCR. These comments have been synthesized and summarized below, organized by thematic topic. Following each issue the DCR response, including substantive changes to the RMP are noted.

Traffic

Summary of public comments

Eight (8) individuals sent comments by email that expressed serious concern over the potential for increased traffic flow onto Trapelo Road and Concord Avenue, resulting from DCAM's recent construction of the access road connecting the north and south Metropolitan Parkway segments. This would not only bring the Lexington traffic onto Trapelo Road in Waltham, but could also mean that the Beaver Brook North Reservation would become a cut-through to Route 2. Several individuals, including the Chairman of the Lexington Planning Board noted that the communities had not been consulted in this action, which conflicted with their understanding of the Reuse Plan, created after years of negotiations with the municipalities. Many reiterated the understanding that the AvalonBay residential development would enter and exit the site from Concord Avenue, while the recreational traffic would enter from Trapelo Road. Other comments related to vehicular roads included the expressed need for sidewalks along Trapelo Road, as it is currently used by pedestrians and very dangerous.

DCR response and RMP revisions

As the RMP goes to print, the access road connecting the north and south segments of the Metropolitan Parkway has been completed. Since Waltham has not yet constructed its [golf course] parking area, DCAM exercised its right to connect the two parkway segments to provide emergency access to the AvalonBay development from both Trapelo Road and Concord Avenue. This resulted in a new access road that makes it possible to travel by car from Trapelo Road to Concord Avenue.

The 1994 MSH Reuse Plan and agreements provided for a DCR parking area in the location of the new access road constructed in 2005-6 by DCAM. The final RMP suggests an alternative configuration for a DCR parking area near this location. If the City of Waltham [golf course] parking lot is constructed in the future, it will be possible to return to the original proposal, which provided

emergency access through the Waltham parking lot, rather than the recently constructed access road. DCR also recognizes the need to collaborate with the municipalities regarding traffic monitoring and mitigation. Finally, the Metropolitan Parkway South intersection at Trapelo Road has limited visibility due to the alignment (curvature) of Trapelo Road, location of existing utility poles, and vegetation so that further evaluation of this intersection is warranted in the future.

Trail Use and Mountain Biking

Summary of public comments

Twenty-one (21) individuals commented on issues related to mountain biking in the North Reservation. The vast majority expressed concern regarding the proposed closure of the narrow [single track] trails for habitat protection. Many clearly stated the long-term, established use of mountain biking in the former MSH land and the strong desire to keep the secondary trails open for continued mountain bike use. Other comments included concern that the draft plan implied that mountain bikers were responsible for the erosion on Mackerel Hill, which was actually caused by the alignment of the trail straight down the slope. Several comments were received from members of the New England Mountain Bike Association (NEMBA), who work collaboratively with the DCR on other properties such as the Middlesex Fells. By working collaboratively with NEMBA and others, many suggested that the trails could be cooperatively managed and maintained to provide sustainable recreational use. One individual also recommended that the plan recommend a comprehensive trail assessment and that the DCR obtain better information on existing recreational uses.

DCR response and RMP revisions

Many of the single track trails follow ridge lines and eskers that wind through the interesting topography of the North Reservation. At present, trail use does not appear to threaten the existing significant wetlands and vernal pools and most of the trails are in good condition. Therefore, based on the aforementioned public response, the draft plan has been substantially changed to provide for continued mountain bike use on the narrow trails. This resulted in the recommendation of four types of trails in the reservation:

1) paved bikeway adjacent to the Metropolitan Parkway,
2) multi-use trail on the carriage road,
3) multi-use rustic trail on most of the existing narrow [single track] trails, and
4) pedestrian rustic trails.

All of the multi-use trails allow for both pedestrians and mountain bikes. A few narrow trails do bisect wetlands and additional boardwalks will be required in these locations. Future monitoring will also be needed to ensure that additional volunteer trails do not expand the rustic trail system beyond their current configuration and to determine if and when seasonal closures may be necessary for habitat protection and wildlife migration. Regarding the existing erosion on Mackerel Hill, the alignment of the trail does make it very susceptible to erosion, caused by water flowing directly down the slope. The plan has been revised to recommend that the Mackerel Hill trails remain limited to pedestrian use in the short term. However, the plan recommends realignment of the Mackerel Hill trail and the installation of drainage improvements to divert water where needed so that this trail can be used and maintained for multi-use including mountain biking. Additional recommendations to develop a more accurate map and assessment of the existing trail system and to better understand the existing and potential recreational users have also been added to the RMP. As stated in the draft RMP, motorized trail use is not permitted in the expanded Beaver Brook Reservation.

Proposed Visitor Center and DCR Parking

Summary of public comments

Two individuals, including the Chairman of the Lexington Planning Board voiced serious concern regarding the alternative locations for a proposed DCR visitor center and parking area on the north segment of the parkway, rather than the former MSH Administration Building.

DCR response and RMP revisions

The alternative locations for the visitor center and parking area have been removed from the RMP, with the recommendation that a DCR visitor center be developed in the former MSH Administration Building with a small proposed parking area located in the area originally designated for such use in the 1994 Reuse Plan.

MSH Reuse Plan

Summary of public comments

Many of the comments related to traffic, parking, and the DCR visitor center reiterated their concern that the RMP be consistent with the provisions of the 1994 MSH Reuse Plan.

DCR response and RMP revisions

The Reuse Plan and its amendments give DCAM the right to construct the access road discussed above in order to provide emergency access to the development parcel. Other recommendations in the RMP related to DCR parking and a visitor center have been revised to keep them consistent with the intentions of the Reuse Plan. As the AvalonBay development is constructed, and pending a final decision from the City of Waltham regarding the proposed golf course, additional work will be needed to update this RMP to reflect site conditions, issues, opportunities, and increased public use resulting from the reuse of these adjacent properties.

AvalonBay Development

Summary of public comments

Several individuals voiced concern regarding potential impacts to the reservation from the AvalonBay residential development. The primary concerns expressed related to the potential for further easements and encroachments into the reservation and the potential for adverse impacts to the reservation during the construction process.

DCR response and RMP revisions

The acquisition and construction agreements for the redevelopment of the MSH core campus are the responsibility of DCAM. However, the DCR reservation, including over 250 acres of sensitive habitat, completely surrounds the new residential development. Furthermore, as a result of building demolition, debris removal, and parkway construction, several site issues remain unresolved by DCAM as of June 2006. These include finish grading and re-vegetation at the debris removal sites and nearby carriage roads, damage to MetFern Cemetery, the lost vehicular connection to the historic carriage road, siltation fencing still remaining in the reservation, lost pedestrian trail connections, and construction materials storage. For this reason, the RMP recommends that DCR regularly monitor the AvalonBay construction project to determine if and when any inadvertent damage to the reservation occurs, so that immediate remediation can be accomplished. Tree protection agreements and site protection fencing may also be warranted.

Conservation Stewardship

Summary of public comments

Several respondents voiced strong support for a conservation and preservation approach for the new reservation, including further evaluation of the potential vernal pools, encouraging passive or less intensive recreation, limiting public use to the existing trail system, managing invasive species, and prohibiting motorized vehicles. Many noted that the reservation is one of the most beautiful open spaces in the area.

DCR response and RMP revisions

These comments support the general direction of the RMP. Recommendations to further evaluate the potential [non-certified] vernal pools have been added to the RMP.

Waltham's Proposed Golf Course

Summary of public comments

One individual voiced opposition to the proposed golf course, largely due to the potential for site alteration and loss of important vegetation, trees, and habitats. Two individuals suggested the alternative use of the site for disc golf.

DCR response and RMP revisions

The golf course is proposed on City of Waltham land on which DCR holds a conservation easement. The RMP includes an environmental evaluation of the golf course proposal in relation to the DCR reservation. Decisions regarding the future use of the 54-acre Waltham land will be determined by the City, subject to the provisions of the conservation easement.

Trail Partnership Opportunities

Summary of public comments

Two individuals provided suggestions related to collaborative trail projects. Belmont's proposed Waverley Trail would potentially terminate at Beaver Brook Reservation and celebrate the role the reservation has played in the history of landscape preservation and conservation in Massachusetts. The Friends of the Western Greenway proposed designating a greenway connector trail through the North Reservation, from Rock Meadow to Walnut Street in Waltham. Several members of NEMBA noted the potential for partnering related to trail planning and improvements. One individual noted that a considerable grassroots effort by mountain bikers existed prior to the transfer of land to DCR, which focused on trail maintenance, removal of fallen trees, and litter removal.

DCR response and RMP revisions

The Waverly Trail proposal is consistent with the RMP recommendation to recognize the historical importance of the first reservation in the Metropolitan Park System, and the need to enhance public education and interpretive opportunities. Similarly, the Western Greenway connector trail suggestion supports the objectives of the RMP related to connections to adjacent open space. Part of this connection exists; the connection to Walnut Street is not yet established but is an important recommendation of the RMP. DCR also supports the potential for active participation with NEMBA and other trail users related planning and implementing a sustainable trail system at the Beaver Brook North Reservation.

Mackerel Hill Summit, Water Tower and Cell Tower

Summary of public comments

Comments regarding the summit of Mackerel Hill, the water tower, and the future of enhanced cell tower use generally supported removal of the water tower and restoration of the summit to its natural condition and the provision of scenic views. A few individual supported enhanced cell tower use, provided the issue was studied further to determine the visual impact and that income derived from the tower could be re-directed to support the management of the reservation.

DCR response and RMP revisions

Assess the removal of the water tower is a high priority for DCR, involving public safety, environmental, and management issues. Enhanced cell tower use would have to meet several criteria. Another related issue is the fact that vehicular access to the cell tower would have to be maintained through the Gaebler School, which has been acquired by the City of Waltham. See the site utility recommendations in Chapter 4 and high priority capital improvements in Chapter 5 for more information.

Additional Public Comments

- Duck feeding is currently allowed at Beaver Brook Reservation mill ponds but should be prohibited. DCR: concurs.

- RMP should support DCR acquisition of Lot 1 (former Middlesex Hospital) as additional open space. DCR: the property is currently under the jurisdiction of DCAM. Acquisition of Lot 1 as open space is consistent with the goals and objectives of the RMP.

Massachusetts Natural Heritage and Endangered Species Program Comments

The NHESP provided a thorough review of the draft RMP, and offered both clarification and corrections related to the natural resource inventory and analysis. The comments included corrections to species names and other editorial suggestions as well as noteworthy revisions to the expected rare plant and animal species. In a letter dated June 6, 2005, the Natural Heritage and Endangered Species Program (NHESP) states that Spotted Turtle (*Clemmys guttata*) have been observed within the vicinity of the site as recently as 1993 (Note that the Fisheries and Wildlife Board voted on May 23, 2006 to de-list the spotted turtle from rare species status). Despite this change, the NHESP noted that conservation measures were still warranted to protect the species from further decline. Other noteworthy comments included the clarification that Marbled Salamander, Violet Wood Sorrel, Grooved Flax, and Long-leaved Bluet are documented as historical records in the area, rather than as priority habitat. These clarifications have been noted in the RMP.

Substantive Revisions to the RMP Based upon Additional DCR Staff Review

Additional changes to the draft RMP reflect revisions necessitated by the changing site conditions at the Beaver Brook North Reservation, as well as technical clarifications related to other topics in the draft RMP. The important issue for DCR operations is the lack of DCR vehicular access for maintenance and emergency purposes, caused by the grade change and curb for the north segment of the new Metropolitan Parkway constructed by DCAM. This construction makes it extremely difficult for DCR vehicles to access the carriage road and the interior of the reservation, including the MetFern Cemetery. Pre-arranged visitor access to the Cemetery for individuals who are not able to walk the distance must also be provided. For this reason, the RMP now recommends a curb cut, re-grading as required, and a DCR-gated entrance to the needed DCR access road from the north parkway segment. Another important change to the RMP involves re-establishing a major trail connection from the south parkway segment over a small brook near the south parkway entrance from Trapelo Road. See the revised Recommendations Map for the Beaver Brook North Reservation for geographic locations, and Chapter 4 Recommendations and Chapter 5 Capital Improvements Implementation Strategy for more information.

The text of the RMP was also revised to clarify the terms of the DCR golf course conservation easement, stating that the City of Waltham property shall be "retained in perpetuity predominately in its natural, scenic and open condition for golf course and other conservation, playground, recreational, conservation, and/or park uses." Other, more minor revisions to the RMP include changes to the Land Stewardship Zoning Map for Beaver Brook Reservation, which now includes only the intensively used recreation areas (spray pool and picnic pavilion area, tennis courts, parking, and ball field). The Operations and Management Plan has been revised to note the existing DCR staff as Level 1.

After release of the final draft RMP in June 2006, DCR completed a Preservation and Maintenance Plan for MetFern Cemetery and implemented stabilization work that vastly improved site conditions, and which included a dry-laid stone wall along the edge of the cemetery bordering the carriage road. These changes have been noted in this final RMP. The final RMP also includes a substantially revised Chapter 5: Capital Improvements Implementation Strategy, which presents recommended capital improvements as basic vs. enhanced level of service, with associated conceptual costs, consistent with other RMP documents. Other changes for consistency include the addition of the 2008 MassGIS orthophoto map, and a section of the USGS quadrangle map.

For the final RMP, the original reservation is called "Beaver Brook Reservation" while the 254 acres of the former Metropolitan State Hospital Land is called "Beaver Brook North Reservation."

Summaries of First and Second Public Meetings

First Public Meeting - Summary

Expanded Beaver Brook Reservation Resource Management Plan

Location: Massachusetts Audubon Society
Habitat Education Center
9 Juniper Road
Belmont, MA 02478

Date: March 7th, 2006

Present:
State officials, DCR staff, and consultants
State Representative Anne Paulsen

Dan Driscoll, DCR Senior Project Manager; Leslie Luchonok, DCR RMP Program Director; Richard Stewart, DCR Fells District Manager

Marion Pressley, Principal; Lauren Meier, Project Manager and Swaathi Joseph, Landscape Designer, Pressley Associates; Richard Kirby, Wetlands Scientist, LEC Environmental

Approximately thirty individuals from Belmont, Waltham and Lexington signed in, representing the Waltham Land Trust, City of Waltham, Belmont Citizen-Herald, New England Mountain Bike Association, Belmont Land Trust, Judith K. Record Fund, Belmont Conservation Commission, Waltham City Council, and Massachusetts Audubon Society.

Introduction

The meeting began with opening remarks from Dan Driscoll, who thanked Mass Audubon and the constituents of Belmont, Waltham and Lexington who rallied to protect the former Met State Hospital land as open space. Dan also reviewed the meeting goals and agenda. Leslie Luchonok summarized the basics of the Resource Management Plan Process. Dan Driscoll gave an update on the current status of the Metropolitan State Hospital land including land disposition and current development activities such as the parkway construction, Avalon Bay development, demolition and site clean up on DCR land, and Waltham's proposed golf course.

Presentation

Lauren Meier of Pressley Associates and Richard Kirby of LEC Environmental followed DCR with a PowerPoint presentation of the findings to date. This included the following topics:

- RMP project area – Beaver Brook Reservation (59 acres), DCR portion of the former Metropolitan State Hospital (254 acres) and the DCR conservation easement on the City of Waltham proposed golf course (54 acres)
- RMP objectives
- Summary of preliminary findings for Beaver Brook Reservation
- Summary of preliminary findings for the former Met State Hospital land
- Summary of preliminary findings for the City of Waltham land
- Preliminary findings for natural resources
  - Habitat inventory
  - Plant community composition
  - Invasive species analysis
  - Wildlife habitat
  - Rare species habitat

- Preliminary findings for cultural resources
- Preliminary findings for recreational resources
- Preliminary findings for adjacent open space
- Preliminary findings for DCR management and operations
- Next steps for the RMP:
  - Complete analysis and prepare recommendations
  - Public review draft open for review and comment
  - Preparation of final draft

Dan Driscoll, DCR Senior Project Manager, was identified as the primary DCR contact person for the RMP project.

Discussion Topics

Water tower – the discussion focused on the current contract for the existing cell tower, which is attached to the water tower and alternatives for Mackerel Hill if the water tower is removed. According to Dan Driscoll, funds generated by the cell tower lease go to DCAM rather than DCR.

Additional 8 acres added to Waltham's land purchase on the Lexington/Waltham town line, where the existing Female Dormitory is located. Now the DCR land encloses the proposed Avalon Bay development and Waltham has not yet determined what they will do with the dormitory building.

Electric poles – what to do? DCR is trying to get DCAM to remove them as they are no longer functional. Utility lines extending to the new Avalon Bay development have been placed under the parkway.

MetFern Cemetery – on site damage requires immediate stabilization; long term management should focus on the Cemetery as a historic feature with respectful memorialization and an edge treatment that provides for future protection & demarcation.

Parkway:

- Additional gravel is present onsite as a result of the ongoing construction; the project required a 500% increase in blasting due to bedrock.

- Question: Have plans for roadways changed from what was originally designed? Answer: Yes. Trees will be planted along the parkway along with historically appropriate lights.

- Question: If the golf course is not developed, will the parking lot still be developed that connects the two access roads? Answer: Even if Waltham does not build the golf course, they are required to take down the female dormitory and build the parking lot connecting the N&S parkways. If the City fails to do this, DCAM will build the parking lot and send the bill to Waltham.

Waltham's proposed golf course

- Question: Did the evaluation consider any options for another less recreational use or another golf course, such as Frisbee golf, that would have less impact? Answer: The evaluation focused on the environmental impacts of the proposed golf course in comparison to conservation land.

- If the golf course is not built, Waltham will retain the land but will be required to coordinate with DCR for passive recreational use.

- The golf course can be built by a private entity, but must remain open to the public (Waltham citizens).

- During the land disposition process with DCAM, 3 people per community were involved in the review. The golf course review committee emphasized use of Best Management Practices (BMPs).

- The time limit for the City of Waltham to construct the golf course was originally 5 years, and is now extended to 7 years.

RMP schedule

- Draft – May 10 public review draft will be available with a 30-day comment period.
- Final draft RMP – June 30

Rare species, wetlands, habitats

- Question: Were any rare species observed onsite? Answer: Species identified were based on cursory review of habitat conditions.
- Some discussion of other observations by local individuals. A Bentley College professor identified spotted turtles in 1990s. Other individuals have additional information on birds observed.
- Some information is available on historical wetlands.
- Discussion of potential partnerships with educational institutions – collaboration for continued monitoring and data gathering.

Western Greenway

- RMP should include an interpretive trail map that shows the connection to the larger Western Greenway Trail.

Current public access

- There is currently no public access from Trapelo Road and Concord Avenue due to parkway construction. Individuals can enter the parkland from Elsie Turner Field and Rock Meadow. No access to the Avalon Bay Development, which is currently still under DCAM jurisdiction, but will become private property.

Recreation policy

- According to Dan Driscoll, the recreation policy for the new 254-acre portion of the reservation will be implemented in the context of protecting and preserving the resources of the property.
- Question: What about trying to balance recreation uses with resource protection? Answer from Dan Driscoll: at no time will the ecosystem be compromised to accommodate inappropriate recreational uses. Mountain biking may be allowed on selected trails but will be subject to specific seasonal environmental conditions.
- The RMP establishes an overall framework and guidelines for managing the property, but specific uses and management of the property will need to evolve and adapt as public access and recreational use increase, and also in relationship to available DCR management resources.

Lack of physical connection

- The two properties are not contiguous, but are connected by the Beaver Brook.
- Laws governing stream buffer vegetation – Rivers Protection Act/Rivers Bill – Aug. 1996.
- DCR has in the past pursued easements along the brook corridor with a conservation easement – 15 to 20 feet
- Local Conservation Commission has jurisdiction over stream buffers

Geologic features

- Discussion of existing potential eskers on site.

Mosquito control

- Information exists on previous mosquito control work done on Met State land.

Poison Ivy

- Question: Will it be controlled? Response: Only along authorized trails.

Second Public Meeting – Summary

Resource Management Plan for the Expanded Beaver Brook Reservation

Location: Massachusetts Audubon Society
Habitat Education Center
9 Juniper Road
Belmont, MA 02478

Date: May 23rd, 2006

Present:

State officials, DCR staff, and consultants:

Dan Driscoll, DCR Senior Project Manager; Leslie Luchonok, DCR RMP Program Director, Richard Stewart, DCR Fells District Manager

Lauren Meier, Project Manager and Swaathi Joseph, Landscape Designer, Pressley Associates; Richard Kirby, Wetlands Scientist, LEC Environmental.

Approximately twenty individuals from Belmont, Waltham and Lexington signed in, representing the City of Waltham, Waltham Land Trust, New England Mountain Bike Association, Friends of the Western Greenway, Belmont Conservation Commission, Lexington Planning Board, CNC Newspaper, South Lexington Civic Association, Belmont Land Trust and Massachusetts Audubon Society.

Introduction

The meeting began with opening remarks from Dan Driscoll, who thanked Mass Audubon for hosting the second public meeting and gave a brief update on the status of the Met State Hospital. Dan identified the goals for the public meeting:

- Provide an update on the RMP process and schedule;
- Provide a summary of the draft RMP;
- Present proposed recommendations and priority action items;
- Provide a clear understanding of the vision for the expanded reservation as a major component of the Western Greenway; and
- Hear questions, issues, and suggestions related to the future management of the reservation.

Presentation

Lauren Meier of Pressley Associates and Richard Kirby of LEC Environmental followed DCR with a PowerPoint presentation summarizing the major recommendations of the draft RMP. This included the following topics:

- Project schedule
- Project area
- Management objectives
- Characteristics - Beaver Brook Reservation
- Characteristics - Beaver Brook North Reservation
- Characteristics - Waltham land (DCR conservation easement)
- Characteristics - Adjacent open space
- DCR management and operations
- Recommendations
  - Natural resources (balance use, invasive species management, enhance habitats, public information and education)
  - Cultural resources (MetFern Cemetery, Beaver Brook Reservation, historic features, Waverley Oaks)
  - Site and recreation features (trails, carriage roads, parking, visitor center, site interpretation
- Projected public access/implementation plan for Beaver Brook North
- Proposed capital improvements
- Land stewardship zoning

- Recommendations – Management and operations
- Recommendations – Further study
- Information on written public input

Discussion Topics

Pedestrian Access

- The meeting attendees noted the lack of pedestrian connections such as a crosswalk at the entrance along Waverly Oaks Road and deficiency of a sidewalk along Wilson Road leading to the other entrance of Beaver Brook Reservation (south parcel).

- Part of the side walk along Waverly Oaks Road is inside the reservation and is not plowed in winter forcing pedestrians to use the vehicular road. Currently there is a walk to school program in Waltham and the reservation is on the route from Waverly Square.

Mill Street Junction

- MAPC is presently studying the traffic patterns at the Mill Street intersection. Question - Did DCR refer to those studies as part of RMP? Response: Adjacent roads are outside DCR jurisdiction although future traffic monitoring in coordination with the communities is clearly needed.

Friends Group

The group expressed interest in forming a friends group for the reservation. Dan Driscoll suggested that it should take root from Beaver Brook Watershed Coalition.

Avalon Easement

- Dan Driscoll reported that AvalonBay had requested a 25' easement with 20' construction zone for additional parking, which is not in the original Reuse Plan. Many mature trees with nesting owls would need to be removed to accommodate the parking. The DCR Commissioner has the authority to issue such easement, if it is not in conflict with Article 97 of the Massachusetts Constitution. Dan Driscoll suggested that such parking easement will be granted only in exchange for remediation action such as wetland restoration at the cleared debris sites. However, this request appears to have been withdrawn by the developer.

Maintenance

- The group focused on conservation land maintenance through collaborative partnerships.

- Question: Could DCR extend maintenance to adjacent open space properties? Response: Dan Driscoll answered that operations need to develop a maintenance plan for the expanded reservation. Collaborative maintenance to adjacent properties can be extended only after evaluating additional cost and responsibilities involved in the process.

Trails

- Question: Will the recreational activities be removed from Zone 1? Response: Trails in Zone 1 will not be closed, only seasonal closing will be implemented in Zone 1 if needed for ecological reasons. The natural resources will be monitored over time and the trails will be relocated only if needed after monitoring their impact. If required, trails will be rerouted away from vernal pools and wetlands to avoid new disturbance or after the reservation is opened for public use.

- Question: Do all of the trails have to meet ADA conditions? Response: No, only new construction requires ADA compliance. Dan Driscoll noted that DCR hopes to make some of the trails ADA compliant in future using stabilizers such as those used at the Alewife and Neponset Reservations and discussed the possibility of AvalonBay facilitating the ADA trail work.

- Question: Will the multi-use trail be paved? Response: The multi-use trail on the existing carriage road will not be paved, but may be stabilized as described above.

- Concern was raised over the proposed closure of secondary trails. DCR and the consultant team proposed further evaluating the trails for the final draft RMP.

Traffic

- The meeting attendees raised considerable concern over anticipated traffic increases along neighboring streets as the new parkway now connects Trapelo Road and Concord Avenue. Dan Driscoll responded that the cul de sacs ending the north and south segments of the parkway have been connected by DCAM because the golf course parking lot is not yet built. The original parking lot design for both the golf course and DCR accommodated the emergency access road and the circuitous route through the parking areas would have presumably reduced through traffic and the potential for vehicles traveling onto and from Trapelo Road. See the next discussion under AvalonBay.

- The group raised continued concerned about connecting Concord Avenue and Trapelo Road as it will become a new connection to Route 2, which will increase the traffic in addition to the traffic generated from Avalon development. One suggestion to discourage increased traffic flow was to implement reduced speed limit and speed bumps.

- Did MAPC and DCR collaborate to integrate the traffic study for the Trapelo Road corridor into the RMP? Response: No, this is outside the scope of the RMP, but DCR recognized the need for continued collaboration with the local communities regarding traffic monitoring and planning.

AvalonBay Development

- Since Lexington will benefit from the tax revenue associated with the AvalonBay development, the traffic from the residential area should be directed to Concord Avenue in Lexington and not onto Trapelo Road in Waltham. Dan Driscoll responded that the AvalonBay development needs two points of egress to meet local zoning and permitting requirements. The originally proposed connection through the parking lot to Trapelo Road met this requirement. However, since Waltham has not constructed their parking lot, DCAM exercised their right under the Reuse Plan and constructed the emergency access connection.

- The group also discussed the impact of future residential housing adjacent to the reservation. Question: How will future utility easements such as the proposed 25' parking easement be addressed? Dan Driscoll responded that any easement that adversely affects the ecological balance of the reservation will not be granted. All easement requests will be scrutinized in detail by DCR at all times.

- Question: Will there be public access to Avalon development from the reservation? DCR response: Access to the development will be closed by next month [June 2006] as soon as the property transfer is completed.

- Question: How many units are being put in? Response: 387 units with mixed use – 80% market price / 20% affordable

- The group discussed traffic mitigation such as shuttle bus & bike paths to reduce traffic impacts from the Avalon development.

Dog Policy

- Question: What is the dog policy for the North Reservation? Dan Driscoll responded that DCR recommends that dogs be leashed consistent with the original Beaver Brook Reservation, but if needed it may become a no dog policy depending on how heavily the public uses the new reservation dog walking and the resulting impact on the fauna.

Water Tower and Cell Tower

- The discussion about the future of the water tower prompted Dan Driscoll to bring up semi-privatization of public spaces. DCR can remove the water tower and accompanying cell phone equipment at any time (like they did in Blue Hills Reservation). Upon removal of the water tower and depending on fiscal benefits from cell tower use agreements, a more visually compatible cell tower may be installed to blend with the natural growth on Mackerel Hill. Any final action would need to be implemented with minimum disturbance to the rest of the hill. However, the future of the water tower and potential cell tower use requires an in-depth assessment by the DCR.

- Question: What kind of revenue is involved in leasing Mackerel Hill for cell tower use? Dan Driscoll responded that the cell tower may bring in $25-30,000 annually. This option will be considered only if legislation earmarks the lease income exclusively for reservation improvements including new staff. DCR retains the right to evict permitted uses such as a cell tower. The contract will be such that the cell company will be responsible for removing the tower. For example, Sprint paid for the removal of tower at Blue Hills Reservation.

- Question: Will cell phone towers impact household phone use? Response: It is not known to do so.

Golf Course

- Question: What measures will be taken for the water needed to maintain the golf course? Will the bed rock water connection to surface water be utilized without affecting the wetlands? Dan Driscoll assured the audience that Waltham can develop the golf course only under best management practices protecting the wetlands with proper remediation. The Second Amendment to the Reuse Plan specifies that golf course will be developed only after evaluating wetland impacts. Under the DCR conservation easement, Waltham will need a state permit to develop a well to use ground water.

- Question: Who will be responsible (financial implication) for golf course failure? The detailed golf course impact study by Pressley does point out the implications of developing the golf course on that site. Waltham will be responsible for any golf course or other open space or recreation use developed on the site.

Endnotes

[1] See the Department of Capital Planning and Operations. "Metropolitan State Hospital Reuse Plan," 1994 and associated amendments.

Golf Course Evaluation Report

Revised January 10, 2006

Pressley Associates, Inc.
Landscape Architecture

LEC

Proposed golf course site, 2005

Introduction

The City of Waltham's proposed golf course is located on approximately 54 acres that were formerly part of the Metropolitan State Hospital (MSH).[1] Located approximately nine miles northwest of Boston, within a residential and institutional neighborhood the MSH site totals about 340 acres of fields, woodlands, wetlands, and over twenty buildings in the municipalities of Belmont, Lexington, and Waltham, bounded by Trapelo Road to the west and Concord Avenue to the east (Figure 1). The proposed nine-hole golf course was included in the MSH Reuse Plan (1994) after the property was declared surplus in 1992. While title to the 54-acre parcel went to the City of Waltham, the Department of Conservation and Recreation (DCR) holds a conservation easement that stipulates the land "will be retained in perpetuity predominately in its natural, scenic, and open condition for golf course and other conservation, recreational, conservation, and/or park uses … and to prevent any uses that will significantly impair or interfere with the recreation and conservation values thereof."[2]

The proposed golf course site is directly adjacent to both the original 59-acre Beaver Brook [Waverley Oaks] Reservation, and 254 acres of the MSH land that has been transferred to DCR as part of the newly expanded state reservation. This report evaluates the potential impacts of the proposed golf course development, and will form an appendix to the expanded Beaver Brook Reservation Resource Management Plan Report currently underway by Pressley Associates, Inc. and LEC Environmental Consultants. The primary purpose of the Golf Course Evaluation is to provide feedback to the DCR to assist them as they work with the City of Waltham on plans for the 54-acre site.

According to the Reuse Plan, the golf course design must mitigate all adverse environmental effects, including replication of any lost wetlands on the site. An 18-hole golf course was studied initially and found to have unacceptable impacts on wetlands and other environmentally sensitive areas in the site. As part of the transfer to the City of Waltham, the Reuse Plan also provides for a $600,000 payment to the DCR Urban Park Trust Fund, derived from the sale and dedicated to the operation and management of the expanded reservation.

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[1] The exact acreage for the golf course site varies slightly. Information from the DCR related to the scope of work for the RMP used a 54-acre figure, which is reflected in this evaluation. James M. Cortell and Associates, Inc., who prepared several studies for the City of Waltham use the figure of 56 (55.8) acres for the golf course site.

[2] "Conservation Easement by and between the City of Waltham and the Commonwealth of Massachusetts" (2002), 1-2.

Methodology

This evaluation has been prepared by Pressley Associates and LEC Environmental Consultants, Inc., (LEC). In particular, LEC's site evaluation inventoried the habitat communities and evaluated the extent of wildlife habitat contained within the 54-acres site. LEC conducted two site evaluations on May 17, and June 23, 2005 to traverse the property, inventory habitat communities, and evaluate their potential for wildlife habitat. LEC also reviewed appropriate maps and scientific literature to compare existing site conditions with wildlife habitats and ecological relationships documented under similar conditions throughout New England. While it was not LEC's purpose to inventory wildlife utilizing the site, prominent wildlife observations are noted. Based on the results of the site evaluation, LEC has determined that the site provides significant wildlife habitat resources for a variety of mammals, birds, reptiles, amphibians, and invertebrates, and contributes to the overall wildlife habitat value of the adjacent Beaver Brook Reservation including the former Metropolitan State Hospital land and other open space properties nearby. The information provided in this preliminary submittal will be expanded for the entire Reservation and included as a component of the RMP existing conditions chapter. Pressley Associates has also considered the golf course design for its functional and aesthetic value, and the potential effects of the golf course on the maintenance and management of the expanded reservation.

This evaluation is organized into four distinct sections:

I. Site description – including a general description of the 54-acre site, its geology and topography, and the current habitats including a discussion of specific habitat types, diversity, and open space context.

II. Evaluation of the proposed golf course design – includes a discussion of site suitability to the proposed golf course and other design issues.

III. Evaluation of potential site impacts – presents potential impacts (both positive and negative) related to public recreation, visual character, and ecological impacts.

IV. Conclusion – presents a summary of key points discussed in the evaluation.

Meadows along the entrance drive, 2005

Six site plans (Figures 1-6) illustrate the proposed golf course site, wetlands, vegetative cover, and three alternative layouts for the 9-hole course.

I. Site Description

The 9-hole golf course is proposed on 54 acres of the former MSH site owned by the City of Waltham facing Trapelo Road between Marguerite Avenue and Porter Road. The existing MSH entrance driveway leads from Trapelo Road to a circular roundabout in front of the existing Administration Building, bisecting the site proposed for the golf course. A new park drive located further northwest on Trapelo Road is currently under construction and will completely replace the original driveway, relocating the entrance.

Soft ball field at Elsie Turner Field, 2005

Overall, the golf course site has vegetative buffer along Trapelo Road with openings at the entrance and Elsie Turner Field. Open meadow areas border the entrance drive on moderately undulating topography with scattered evergreen trees on the northern side. The open area south of the entrance is separated from Elsie Turner Field by a wooded area that forms part of the foot of Mackerel Hill. The ball field with gravel parking area is surrounded by wooded buffer on two sides, a private inholding, and Trapelo Road. The ball field has a back stop, two players' benches, one bleacher, and one trash drum.

Administration Building in the former Met State Hospital grounds, 2005

Adjacent to the south end of Elsie Turner Field, a small private inholding along Trapelo Road constricts the Waltham proposed golf course site, with a narrowed connection to the wooded area at the bottom of Mackerel Hill. This wooded area transitions into an

open field that slopes up to the parking area of the Gaebler School. A portion of this parking area, with a panoramic view of Boston, is proposed to be part of the golf course. The Gaebler School driveway defines the southernmost boundary of the proposed golf course site.

The northern most part of the site proposed for the golf course consists of a wooded area bordered by the Metropolitan State Hospital buildings, Trapelo Road, and Marguerite Avenue. A two-acre inholding is located the corner of Marguerite Avenue and Trapelo Road.[3]

According to the 1998 Cortell Associates Report, five Bordering Vegetated Wetlands (BVWs) are located in the proposed golf course study area with an additional BVW located north of the study area near Elsie Turner Field (Figure 2).

A portion of the expanded 254 acres of the former Metropolitan State Hospital, now part of the expanded Beaver Brook Reservation, borders the northeast side of the golf course site. In combination with other adjacent open space such as the Rock Meadow conservation land, McLean Hospital open space, Highland Farm (Mass Audubon), and Lexington conservation land, this "Western Greenway" represents a significant tract of contiguous, undeveloped land. Structures and infrastructure formerly associated with the Metropolitan State Hospital are located immediately north and southeast of the site, while residential development occurs to the southwest, southeast, and west.

The proposed golf course site is comprised of several diverse habitat types, including upland and wetland forest, successional field, and upland and wetland meadow including emergent marsh. A network of walking trails within the property and extending northerly into the adjacent Reservation provide passive recreational use.

Geology and Topography

The property's topography in relation to the surrounding landscape is depicted on Figure 3. The site contains a prominent drumlin, known as Mackerel Hill. Topography varies from gently-sloping to moderately steep relief, as the landscape descends from the drumlin towards the base of Mackerel Hill, which is a comparatively flat, ground moraine. Soils atop the drumlin are generally comprised of compact glacial till, while more friable soils are associated with the surrounding ground moraine. The ongoing construction of the Metropolitan Parkway has also revealed substantial bedrock on the site.

Habitat Types within the Proposed Golf Course Site

A variety of regionally common, but botanically diverse vegetated habitats are contained within the proposed golf course site, including forested upland and wetland, successional field, and upland and wetland meadow. A brief description of each of these is outlined below. The potential impacts to these habitats, resulting from the construction of the proposed golf course are discussed

Upland forest, 2005 (LEC)

Upland Forest

Two major upland forested areas comprise the southeastern and northwestern portions of the site. Maturing stands of Sugar Maple (*Acer saccharum*) dominate the canopy within the southeastern forest, while the northwestern forest is dominated by maturing Northern Red Oak (*Quercus rubra*). Both forests maintain understories varying in density and species composition and provide ideal habitat for a variety of forest-dwelling birds and mammals. Understory species observed include sapling canopy species, Maple-leaf Viburnum (*Viburnum acerifolium*), Black Huckleberry (*Gaylussacia baccata*), Buckthorn (*Rhamnus* spp.), Wild Sarsaparilla (*Aralia nudicaulis*), Celandine (*Chelidonium majus*), False Solomon's Seal (*Smilacina racemosa*), Wood Anemone (*Anemone quinquefolia*), and Bracken Fern (*Pteridium aquilinum*). Both upland forests vegetate drumlin hills and afforded multi-directional

[3] Shown as the Commonwealth of Massachusetts on the 2002 Metropolitan Parkway survey plans.

aspects, resulting in a range of sunlight penetration and hydrology. The maple forest has significant habitat connectivity to additional forest within the adjacent Reservation, while the oak forest maintains limited habitat connectivity to the Reservation via a narrow corridor of forest and emergent marsh along its northern edge.

Wetland Forest

While the extent of forested wetland is limited to the central portion of the subject property, expansive areas of forested wetland occur northeast of the site within the Beaver Brook Reservation. The wetland forest is dominated by Red Maple (*Acer rubrum*), and varies from very swampy areas to more 'terrestrial' wetlands along the wetland edge. Understory plants include Sweet Pepperbush (*Clethra alnifolia*), Highbush Blueberry (*Vaccinium corymbosum*), Winterberry Holly (*Ilex verticillata*), Wild Geranium (*Geranium maculatum*), Skunk Cabbage (*Symplocarpus foetidus*), and Jack-in-the-Pulpit (*Arisaema triphyllum*). The wetland forest is the principle vegetation on the ground moraine surrounding the adjacent drumlin hills. Networks of intermittent streams and nearby water sources including an extensive emergent marsh system, Beaver Brook, and numerous Vernal Pools bolster the forested wetland's habitat value.

Successional Field

Successional fields are fallow areas that are populated by herbaceous plants, shrubs, and sapling trees. This habitat occurs east of the water tank, extending toward the southeastern State Hospital structure. Dominated by grasses and herbaceous plants, this habitat also includes scattered patches of sapling trees and shrubs, including Northern Red Oak, Black Locust (*Robinia pseudoacacia*), feral apples (*Malus* sp.), Red Cedar (*Juniperus virginiana*), and Dogwood (*Cornus* spp.). This unique habitat provides the habitat advantages of both forest and field, and provides significant 'edge' habitat preferred by many species of migratory birds, mammals, and reptiles. During the May 17, 2005 site evaluation, LEC encountered an inordinate number of Baltimore orioles within the successional field habitat, indicating that the golf course site likely functions as a stopover point for migrating birds.

Upland Meadow

The north-central portion of the property is comprised of a meadow containing a diverse variety of grasses and wildflowers, with scattered mature Norway Spruce (*Picea abies*) measuring 60 to 80 feet high: a significant landscape feature within the site. The majority of this meadow is comprised of upland species, including Timothy Grass (*Phleum pratense*), Fescue Grass (*Festuca* sp.), Quackgrass (*Agropyron repens*), English and Common Plantain (*Plantago lanceolata* and *P. major*), St. John's Wort (*Hypericum* spp.), Yarrow (*Achillea millefolium*), Milkweed (*Asclepias* spp.), Hawkweed (*Tragopogon pratensis*), White Campion (*Silene latiflora*), and Oxeye Daisy (*Leucanthemum vulgare*). While species utilizing the successional field will also occur within the upland meadow, the meadow habitat is more open with scattered towering spruce trees, providing the preferred hunting habitat for raptors. The upland meadow also provides nesting habitat for ground-nesting birds which generally require large tracts of open land.

Upland meadow, 2005 (LEC)

Wetland Meadow

Pockets of wetland meadow habitat occur along the forested wetland edge within the southern portion of the meadow, and along an intermittent stream channel that bifurcates the meadow immediately south of the Norway Spruce clusters. Patches of Reed Canary Grass (*Phalaris arundinacea*), Purple Loosestrife (*Lythrum salicaria*), Sedges (*Carex* spp.), Rushes (*Juncus* spp.), and cattail (*Typha latifolia*) primarily vegetate the wetland meadow. While this habitat is somewhat limited within the larger upland meadow, the stream provides a water source for wildlife and the differing plants provide a variety of food resources, particularly for red-winged blackbird (*Agelaius phoeniceus*), which were observed in abundance within adjacent emergent marsh habitat.

Wetland meadow, 2005 (LEC)

Habitat Diversity and Value

Three primary characteristics contribute to the golf course site's ability to provide significant wildlife habitat both locally and regionally, including habitat diversity, the extent of edge habitat, and the site's location in relation to other protected open space. While each of these site features is important individually, their benefit to wildlife is compounded when occurring within the same site.

Habitat Diversity

As discussed above, the site contains a variety of diverse habitats ranging from field to maturing forest. This habitat heterogeneity provides a variety of feeding, breeding, migratory, over-wintering, and cover resources for wildlife. Habitat diversity is directly related to species diversity, and contributes to complex arrangements of species interactions and relationships, as well as community stability. For example, the diversity of herbaceous plants contained within the meadow provides a varied array of resources for a host of herbivorous insects, including butterflies and moths [LEPIDOPTERA], grasshoppers [ORTHOPTERA], beetles [COLEOPTERA], and ants, wasps, and bees [HYMENOPTERA]. This variety of herbivorous insects provides a range of prey options for predatory insects, amphibians, reptiles, and birds. Species diversity at these lower trophic levels adds complexity to the food web, and gives rise to community stability.

Meadow and forest edge at the base of Mackerel Hill, 2005 (Pressley Associates)

Edge Habitat

Biological interactions tend to concentrate along habitat edges, or ecotones. While many species may prefer a specific habitat type, others have evolved to exploit the edges occurring along habitat boundaries. Two distinct ecotones associated with the site include upland/wetland edges and forest/meadow edges. While many ecotones occur along a linear interface (e.g. upland to wetland, forest to field), the successional field habitat described above provides extensive edge habitat over a large area, extending the wildlife benefits of the 'edge' to larger numbers of species.

The forest/field interface is the preferred predatory habitat for many raptor species, including hawks [ACCIPITRIDAE] and owls [STRIGIDAE]. The maturing trees provide perching habitat for the raptors as they search for prey within the field below. During the May 17, 2005 site evaluation, LEC observed a red-tailed hawk (*Buteo jamaicensis*) soaring over the upland meadow and perching within the Norway Spruce and adjacent oak forest. LEC also observed numerous small mammal burrows within the upland meadow, affirming that the forest/field edge within the property provides habitat for this predator/prey interaction.

Red-tailed hawk perched in Norway Spruce, 2005 (LEC)

Open Space Context

The contiguous open space system formed by the expanded Beaver Brook Reservation, former Metropolitan State Hospital land, and conservation lands in Waltham, Belmont, and Lexington represents a significant tract of undeveloped land within the Route 128 loop, particularly the area north of the Mass. Pike (I-90). The diversity of wetlands, watercourses, upland forest, and open meadow provide important habitat similar to the open space of the Blue Hills Reservation and Ponkapoag Bog located south of Boston, and the Middlesex Fells. Large tracts of undeveloped land are critical refuges for wildlife, particularly when encapsulated within urban and suburban environments. These areas provide critical stopover points for migrating birds, providing necessary food and cover resources. Furthermore, large tracts of specific habitat types such as forest, meadow, and emergent marsh provide critical interior spaces for reclusive wildlife species that can not thrive in smaller,

Former Metropolitan State Hospital land, now part of the expanded Beaver Brook Reservation, 2005 (Pressley Associates)

fragmented habitats. Significant areas of maturing forest also provide a three-dimensional structure for biological interactions to occur, adding to the 2-dimenational 'area' of land we often consider.

II. Evaluation of the Proposed Golf Course Design

Alternatives

The initial designs for the golf course were developed by Carol R. Johnson Associates, Inc. (CRJA) as part of the MSH Reuse Plan process (1994). Based on the information provided by the DCR, including the Reuse Plan, it appears that CRJA developed at least five schemes for a 9-hole course on the 54-acre site. The DCR provided a 1"=100' plan by CRJA called Scheme #5 from a feasibility study for the Metropolitan State Hospital (Figure 4). Another alternative is incorporated into the Reuse Plan as Appendix C (Figure 5). A revised design by Philip A. Wogan of Wogan and Sargent, Inc. was subsequently evaluated by Cortell Associates in 1995 and used to determine the applicability of the Massachusetts Wetlands Protection Act related to existing wetlands on the site. This revised golf course design was also recorded in the latest electronic AutoCAD plans provided by DCR in June 2005. For these reasons, the design evaluation discussed below is based primarily on the revised plan by Philip Wogan (Figure 6). However, many of the issues that follow related to both design and environmental impacts will be similar for all of the alternative layouts.

Golf Course Design Evaluation

The proposed new park drive and entrance bisects the nine-hole golf course with five holes located north and four holes south of the driveway. The parkway leads to the proposed parking area for 100 cars and the existing MSH Administration Building, which will be rehabilitated as the club house with golf facilities. Trapelo Road is fairly well screened from the proposed golf course site by mature vegetation. The first hole is strategically located close to the club house, north of the entrance. Circulation through the 9-hole course is adversely affected by the entrance drive, which must be crossed twice during a game after holes 1 and 5.

South of the entrance driveway, the proposed golf course site covers approximately 3 acres of lower Mackerel Hill forest stand consisting of second-growth hardwood and some areas of early successional species of forest stand in Elsie Turner Park. This area will be cleared for holes 2, 3, 4, and 5, and the 15 feet wide cart paths. The ball field will be replaced with hole 5. In order to fit holes 3 and 4 into the sloping topography, they are located far from their adjacent holes 2 and 5, and the connecting path must negotiate the steep slopes of Mackerel Hill. Holes 3 and 4 will also require major re-grading of the existing topography, which has not yet been developed as design drawings. Routes between the holes south of the entrance will be confusing as they cross each other and do not follow a logical linear layout. Overall, the fairways for all nine holes are wider and the greens are larger than current standards.

Holes 1, 2, 5, 8, and 9 are located partially on wetlands and the fairways of holes 1, 2, 5, 8, and 9 and the green of hole 2 pass within wetland setbacks. This creates both an ecological and a design/permitting issue for the City. In addition, as discussed above, current construction activities on the site related to the new entrance drive (Metropolitan Parkway) have revealed substantial bedrock, which will likely affect the golf course construction as well.

While there may be alternative ways to redesign the course to reduce some of the aforementioned site issues, overall the 54-acre site with significant wetlands and topography is too constricted to accommodate the 9-hole course without substantial site alteration. Furthermore, Scheme #5 (Figure 4) and Appendix C (Figure 5) both indicates a total Par that is less than optimal for a 9-hole course. A comparison of typical vs. proposed standards for the Waltham course is summarized below.

Scorecard PAR / Number of holes	5	4	3	TOTAL
Proposed 9-hole Waltham course				
▪ Scheme #5	1	6	2	9 holes, Par 35
▪ Appendix C	0	7	2	9 holes, Par 34
Standards				
▪ Typical 9-hole course	2	5	2	9 holes, Par 36
▪ Executive course	0	4	5	9 holes, Par 31
▪ Par 3 course	0	0	9	9 holes, Par 27

III. Potential Impacts of the Proposed Golf Course Development

The following text describes potential positive and negative impacts associated with the proposed 9-hole golf course, based on the preliminary plans provided by the DCR, which indicate only a conceptual layout for the fairways and greens and do not include detailed information related to site grading, tree removal or replacement, or wetland mitigation. Furthermore, the location and distribution of bedrock is not known throughout the 54-acre site, which may substantially increase construction costs.[4]

Recreational Impacts

The proposed golf course will provide a new recreational amenity for the City of Waltham and a public golf course in the northwestern Boston suburbs. Given the size and configuration of the proposed course, it would be well-suited as a training course. Few of the adjacent or nearby communities have public courses. The closest public facilities are Pine Meadows in Lexington and the Fresh Pond course in Cambridge, although there are several private 18-hole courses within a short distance of the proposed site such as the Belmont Country Club, Stone Meadow in Lexington, and the Oakley Country Club in Watertown. This evaluation does not include a user-need study to determine the demand, feasibility, or cost of constructing the 9-hole course, and instead focuses primarily on its potential environmental impacts related to the 54-acre site and the adjacent state reservation.

Depending on the need and market, a public golf course can be a valuable recreational asset to the surrounding community. The 9-hole golf course is also proposed to allow public use in winter. Fairways on Mackerel Hill could be used for sledding, outdoor ponds used for skating, and the fairways and trails for cross-country skiing. However, the existing Waltham ball field will be lost in the process, reducing Waltham's available recreational fields. According to the City website, Waltham currently has 14 ball fields including Elsie Turner Field and 4 athletic fields. The parking area at Elsie Turner Field also functions as an access point for existing trails on Mackerel Hill. As a result, provisions for alternative trail access should be considered as part of the proposed golf course development.

In addition, the golf course will be both visually and physically accessible from trails within the adjacent Beaver Brook Reservation property. For this reason, the RMP alternatives will consider the relationship between existing or proposed trails within the expanded Reservation and the proposed golf course. For example, during the golf season, access to the fairways should be restricted to golfers only, as they pose a safety hazard for pedestrians.

Visual Impacts

The golf course will change the scenic views at the entrance to the former MSH, creating a more contrived and less naturalistic landscape. Given the tight arrangement of the fairways and the required grading, it is likely that most of the mature trees in the open areas of the site (such as the stand of Norway Spruce) will be lost along with the natural meadow landscape. The loss of wooded areas at the northern boundary and the foot of Mackerel Hill surrounding Elsie Turner Field will also alter the visual character of the site. Although moderate alterations are proposed to the existing undulating topography on the northern side of the entrance, the steeper slopes on the southern side of the golf course site will be subjected to terracing and/or re-grading to accommodate the proposed holes and fairways. Screening of the proposed golf course from the busy traffic on Trapelo Road requires supplemental planting to increase vegetative buffer along the boundary. At this time, it does not appear that a fence will be required along Trapelo Road because the line of play is generally parallel to the road and separated by mature trees.

Ecological Impacts

Although specific design plans that show the exact extent of grading, site disturbance, tree removal, protection of existing vegetation, new planting, and wetland mitigation have not yet been developed, it appears that the proposed golf course will result in substantial impacts to the site's existing habitats and plant communities.

[4] Based on communication with DCR related to the current construction of the new entrance drive (Metropolitan Parkway).

Wetlands

Several wetlands are directly and adversely affected by the proposed golf course design as shown on Figure 2. The southern portion of the 2.3-acre Wetland 2 defined in the 1998 Cortell study is proposed to be part of hole 2. Wetland resources identified by Cortell within this wetland include a "Bordered Vegetated Wetland and Bank with palustrine emergent, scrub/shrub and forested areas on Swansea muck soil receiving hydrologic input from groundwater discharge and surface water from an intermittent channel that drains Wetland 3."

Portions of the 1.1-acre Wetland 3 also defined by Cortell are proposed to be part of holes 2 and 5. Wetland resources identified by Cortell Associates include a "Bordered Vegetated Wetland and Bank with palustrine emergent and forested wetland on Udorthents and Montauk soils receiving hydrologic input from groundwater discharge, surface water runoff, overflow from the water tower atop Mackerel Hill, and discharge from a City of Waltham storm drain." Parts of this wetland are already disturbed by periodic mowing.

Portions of the 1.5 acre Wetland 4 are proposed to be part of holes 1, 8 and 9. Cortell identified this as a "Bordered Vegetated Wetland, Bank, and Land under Waterways with mainly turf grasses and limited wetland vegetation tolerant to periodic mowing on Swansea muck soil receiving hydrologic input from groundwater discharge, surface water runoff, and discharge from a City of Waltham storm drain." A perennial stream channel run the length of this wetland and enters a culvert that drains into Wetland 1.

Upland Forest

Areas in the northern section of the proposed golf course site contain upland oak forest, which will be substantially lost for greens, tees and fairways associated holes 6, 7, and 8. It is also likely, that construction access and grading will result in the loss of additional upland forest beyond the edges of the fairways. The Maple forest on the south side of Mackerel Hill will be substantially lost with the construction of holes 3 and 4 and terracing or re-grading required to fit the fairways onto the sloped topography.

Successional Field

A portion of the successional field located southeast of the water tank on Mackerel Hill is located within the Waltham site. It will likely be lost with the construction of fairways for hole 4.

Upland Meadow

The upland meadow located both north and south of the entrance drive/Metropolitan Parkway will be substantially altered with the construction of holes 1, 2, 5, 6, 8 and 9. This includes areas with scattered mature trees, the stand of Norway Spruce, and buffers to the emergent marsh that passes through the upland meadow. Most, if not all of the scattered mature trees in the meadow will be lost, and the native grasses.

While many view golf courses as 'green space' or 'open space' that function similarly to natural, undeveloped habitats, the maintained fairways and greens associated with golf courses lack the plant species diversity and dimensional structure that provide quality wildlife habitat occurring within naturally vegetated meadows and forest. s and forbs will be replaced with a monoculture of species necessary to support the proposed golf course. Proximity to the wetland/emergent marsh, will make the fairways for holes 1, 2, 5, 6, 8 and 9 attractive to Canada geese, which will likely create an increased nitrogen load in the existing wetlands.

Habitat Value, Buffer, and Protection

In addition to providing large tracts of forest and meadow habitat, the proposed golf course site protects the natural communities in the adjacent Beaver Brook Reservation in several ways. First, the area provides a natural, 2000+/- foot wide buffer between the existing residential development located southwest of Trapelo Road and the Reservation. This large area, much of which is forested, buffers human induced noise and activity from sensitive species thriving in the habitat interiors. Further, the extensive forest and meadow vegetation within the proposed golf course site provides for flood control and pollutant attenuation.

Constructing the golf course will require the removal of significant portions of the forested buffer and result in re-grading of the existing, well established forest, meadow, and successional field habitats which will be replaced by a monoculture of maintained, exotic grasses. The native soil will likely be removed or filled in places to accommodate the appropriate grades, altering burrowing

and over-wintering habitat for amphibians, reptiles, and mammals. This alteration will also erode the quantity and quality of the habitat interior, and decrease the value of wildlife habitat associated with the site and the adjacent Reservation as a whole.

Last, the level of site disturbance required to construct the proposed golf course will make the property more vulnerable to invasive species such as Japanese Knotweed, Phragmites, European Buckthorn, and Purple Loosestrife that can easily out-compete the surviving native plants.

Management and Maintenance

The intensive maintenance of such large, manicured areas typically requires the continual use of heavy mowing equipment and the use of herbicides and pesticides. The ReUse Plan, particularly Amendment 2, stipulates that the proposed golf course be maintained using an IPM program and "green practices" to lessen the potential impacts to the Beaver Brook watershed and the adjacent Reservation. Since a maintenance program is not yet developed for the property, it is unknown how, or to what extent the ecosystem will respond to the radical changes in character, re-grading, or new intensive maintenance practices. However, the proposed 9-hole golf course will require more landscape maintenance than the existing conservation use, including both routine landscape maintenance, the management of invasive species, and control of Canada geese.

A maintenance facility location and its requisite infrastructure is not delineated in the conceptual golf course plans, but would likely be needed to support daily maintenance and operation, including equipment and materials storage.

Management Recommendations

Proposed 9-hole Golf Course

The Metropolitan State Hospital Reuse Plan, particularly the 2nd Amendment does include specific parameters and guidelines for the management and maintenance of the proposed golf course, such as:

- Integrated pest management to minimize use of pesticides;
- Runoff from treated areas to be drained through vegetated buffer before reaching wetlands;
- Groundwater quality monitoring wells and groundwater level maintenance;
- Inventory and monitoring of aquatic invertebrate species; and
- Wildlife inventory.

The environmental study conducted by Cortell Associates suggested flagging and staking limits of disturbance for the tees, fairways, greens, and cart path in addition to locating staging and stockpile areas in unforested areas as protection measures for Mackerel Hill forest stand. If design work progresses on the proposed course, the following should be considered:

- The use of native species, particularly grasses and other herbaceous plants, placed in a naturalistic planting scheme so that the new course maintains some of the existing habitat and visual character;
- Narrowing the fairways and reconfiguring the course to avoid or reduce impact to wetlands;
- Reducing and minimizing the amount of re-grading and tree removal;
- Careful analysis of wetland impacts and mitigation; and
- Retaining as much natural vegetation as possible.

As discussed above, the alternatives addressed in the RMP should address visual and physical access to the golf course from the Reservation that both restricts use during active golf play and provides for an integrated experience for cross-country skiing in the winter.

Conservation Land

If the 54-acre site is preserved as conservation land, LEC has the following recommendations for land management:

- Existing meadow habitat and field portions of successional field should be mowed every 2 to 3 years in order to maintain open habitat characteristics;
- Invasive species, while not taking over portions of the site, are present in localized pockets and should be managed appropriately (e.g. black locust, purple loosestrife, common buckthorn, etc.);
- Passive recreation (e.g. walking trails, etc.) should be encouraged within a network of limited existing trails to minimize anthropogenic influence on sensitive species.

Conclusion

The proposed 9-hole golf course for the City of Waltham's 54-acre property on Trapelo Road, adjacent to the expanded Beaver Brook Reservation would provide a new public recreational amenity for the City. However, the construction of the 9-hole course on a site with substantial topographic change (Mackerel Hill), wetlands, and valuable plant communities would likely result in substantial site disturbance and the loss of mature trees, meadow and wetland habitats, and Waltham's existing ball field at Elsie Turner Field. This is largely because this site is too small to allow for creative design solutions that could minimize disturbance and protect significant site amenities. In contrast, the George Wright Golf Course maintained by the City of Boston achieves its scenic character through fairways separated by substantial buffers of Oak woodland, but achieves this on over 150 acres for 18 holes.

Should the City of Waltham decide to pursue additional design development for the proposed 9-hole golf course, additional alternatives or modifications should be considered to narrow the fairways to maximize retention of existing vegetation, as well as considering a shorter course. Additional information is also needed to more fully evaluate the amount of re-grading necessary to accommodate the greens, fairways and tees so that a better understanding of the total site impact is possible.

The existing 54-acre site also functions as an important buffer to the natural communities contained within the expanded Beaver Brook Reservation. Loss of the habitat, plant communities, and alterations to the wetlands within the proposed golf course site will likely have a slow and gradual adverse affect on the quality of the plant communities within the state reservation, resulting from an influx of invasive and/or exotic specifies and increased nutrient levels in the wetland system.

A summary evaluation of alternative uses (9-hole golf course vs. conservation land) is included below.

Table E.1: Summary Evaluation of Uses for Land under DCR Conservation Easement

Alternative Use	Public Benefit	Site Impacts and Issues
City of Waltham 9-hole Golf Course	▪ Presents an opportunity for a 9-hole public golf course that could function as a training course. ▪ Golf course could be used for cross-country skiing in winter and passive recreation when the course is not is use. ▪ Parking facility and clubhouse could provide space for visitors to the reservation, including restrooms and orientation/interpretation in the building.	Most impact ▪ Construction will result in the removal of the forested buffer and alterations to the forest, meadow, and successional field habitats, which will be replaced by a monoculture of exotic grasses. ▪ Re-grading the landform will result in the removal of native soil and the introduction of additional fill to accommodate the appropriate grades, altering burrowing and over-wintering habitat for amphibians, reptiles, and mammals. ▪ Site alterations will erode the quantity, quality, and value of the wildlife habitat and the natural buffer to the adjacent Reservation. ▪ Use of the site as a 9-hole golf course may appeal to a more limited constituency. ▪ Greens and tee's may require irrigation, fertilization, drainage and intensive turf management. ▪ Golf course use will result in the loss of Elsie Turner ball field.
Conservation Land	▪ Preserves additional natural area in the Western Greenway. ▪ Has the least affect of adjacent residential areas as well as traffic and safety along Trapelo Road. ▪ Conservation land could include selective new trails and small parking area, providing year-round public access that is compatible with the natural environment.	Least impact ▪ Presents the opportunity for holistic site management to enhance wildlife habitat through an organized mowing program and invasive species management.

List of Sources

"Conservation Easement by and between the City of Waltham and Commonwealth of Massachusetts," 2002.

Goody, Clancy and Associates; Leff Consulting Group; Vanasse Hangen Brustlin, Inc.; Carol R. Johnson and Associates. "Metropolitan State Hospital Reuse Plan." Commonwealth of Massachusetts, Department of Capital Planning and Operations, Office of Real Estate Management, June 1994.

Jason M. Cortell and Associates, Inc. "Environmental Standards Compliance Report, Proposed Golf Course, Metropolitan State Hospital, Phases I and II" for the City of Waltham, October and November, 1995.

Jason M. Cortell and Associates, Inc. "Request for Determination of Applicability, Proposed Golf Course, Metropolitan State Hospital" for the City of Waltham, May 1998.