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Classification of the Natural Communities of Massachusetts

**Patricia C. Swain
and
Jennifer B. Kearsley**

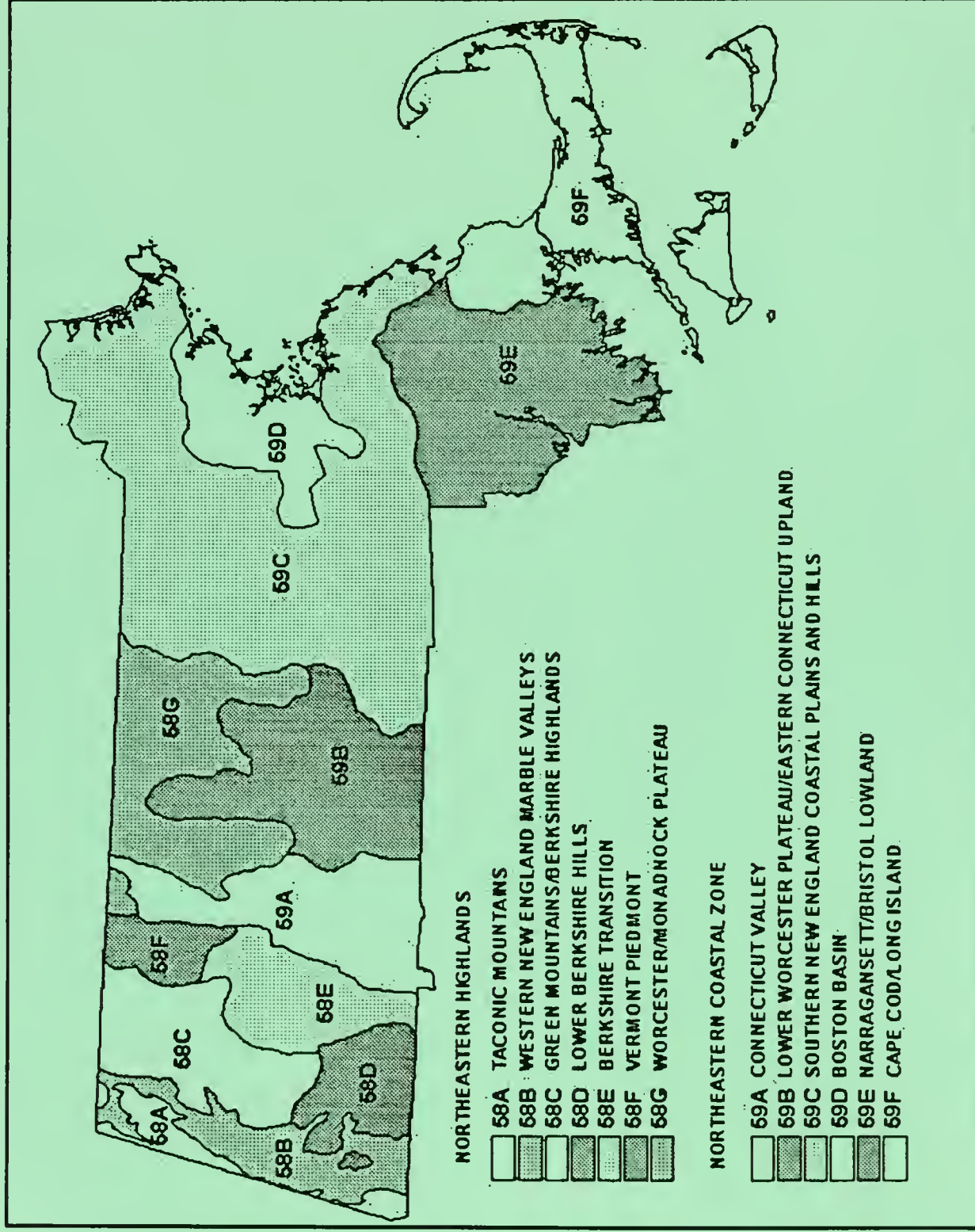
**Natural Heritage & Endangered Species Program
Massachusetts Division of Fisheries and Wildlife
Westborough, MA**

DRAFT

July 2000

The Sub-ecoregions of Massachusetts

(Griffith et al. 1994)



Natural Heritage & Endangered Species Program

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ACKNOWLEDGEMENTS

This draft classification is truly the product of the whole Natural Heritage & Endangered Species Program and the cadre of dedicated field ecologists and naturalists in Massachusetts. Many years of many people's field work and observations, with data compiled in species reports and natural community descriptions, contribute to the core information in the draft classification. Bruce Sorrie's extensive field notes, detailed reports from Glenn Motzkin and Tom Rawinski, and Pam Weatherbee's *Flora of Berkshire County* as well as her field forms were particularly helpful in establishing the details of community composition in Massachusetts. Reports submitted to NHESP's Small Research Contracts Program and Ecological Restoration Program also contributed significant information to the classification. Descriptions of communities from classifications from surrounding states and from The Nature Conservancy have also contributed greatly to the information in the draft classification. Brian Reid, Karen Searcy and Sally Shaw responded to our pleas to contribute written descriptions on communities with which they were particularly familiar. We added the animal and synonym information to these, and did some editing for consistency.

Personal communications and community and rare species field forms from the following people provided additional habitat information and site descriptions: Henry Barbour, Michael Batcher, Jesse Bellemere, Robert Bertin, Beverly Brown, David Burg, Fricka Caldwell, Caren Caljouw, Nancy Childs, Frances Clark, Tom Cramer, Peter Dunwiddie, Ted Elliman, Tamara Enz, J. Garcia, Jennifer Garrett, Meryl Goldin, Matthew Hickler, D.W. Holt, David Hunt, Jerry Jenkins, B. Johnson, Jennifer Kearsley, Heather Lanza, Richard LeBlond, Bruce Lindwall, Robert B. Livingston, Roberta Lombardi, J.P. Lortie, David Lovejoy, Frank Lowenstein, Julie Lundgren, Mark Mello, Glenn Motzkin, Carol L. Nilson, Philip Nothnagle, Allison Park, Charlie Quinlan, Lloyd Raleigh, Tom Rawinski, Brian Reid, Christine Reid, Julie Richburg, Steven Roble, Karen Searcy, Sally Shaw, Scott Shumway, Tim Simmons, Darren Singer, Lesley Sneddon, Paul Somers, Bruce Sorrie, Daniel Sperduto, Valerie Stone, Patricia Swain, Elizabeth Thompson, Tom Tynning, Pamela B. Weatherbee, Henry Woolsey, Bob Zaremba, and Tad Zebryk.

Pat Huckery, Matt Burne, Tim Simmons, and Brad Blodget contributed rare animal information, and Matt Burne and Pat Huckery identified communities that can function as vernal pool habitat. Brad Blodget, Tom French, and Tim Simmons supplied information on more common animal species, especially those using terrestrial communities – but the interpretations and restatements of their information should not be held against them.

The data organization and availability reflect the effective management by several data managers and hoards of interns, work study students, and volunteers over more than 20 years. Preliminary conceptual design and organization was accomplished through meetings of the authors, Julie Lundgren, Henry Woolsey, and Vicki Frey. Vicki Frey and Jean Collins developed the Access database. Jean wrote and enabled the clever 'macro' that italicized the scientific names. David Szczebak and Laura Chaskelson produced the sub-ecoregion distribution maps.

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TABLE OF CONTENTS

ACKNOWLEDGEMENTS

TABLE OF CONTENTS

INTRODUCTION

Page Guide	Introduction - v
------------------	------------------

TERRESTRIAL COMMUNITIES

OPEN (sparse vegetation, less than about 25% tree, shrub, and herbaceous cover)

Rock Substrate:

Summits and Rock Outcrops

Acidic Rocky Summit / Rock Outcrop	T - 2
Circumneutral Rocky Summit / Rock Outcrop	T - 4
Calcareous Rocky Summit / Rock Outcrop	T - 6
Serpentine Outcrop	T - 8
Riverside Rock Outcrop	T - 16

Rock Cliff

Acidic Rock Cliff	T - 10
Circumneutral Rock Cliff	T - 12
Calcareous Rock Cliff	T - 14
Maritime Rock Cliff	T - 20

Unconsolidated Substrate:

Maritime Erosional Cliff	T - 22
Maritime Beach Strand	T - 24
Maritime Dune	T - 26

HERBACEOUS (dominated by herbaceous vegetation, with less than about 25% tree and shrub cover)

Dry Riverside Bluff	T - 18
Sandplain Grassland	T - 28
Cultural Grassland	T - 30

SHRUB communities (less than about 25% tree canopy)

Sandplain Heathland	T - 32
Maritime Shrubland	T - 34
Maritime Pitch Pine on Dunes	T - 36
Maritime Juniper Woodland / Shrubland	T - 38
Scrub Oak Shrubland	T - 40
Pitch Pine - Scrub Oak Community (may be more than 25% pitch pine)	T - 42
Ridgetop Pitch Pine - Scrub Oak Community (may be more than 25% pitch pine)	T - 44

FOREST / WOODLAND (Greater than about 25% tree cover)

Talus Forest / Woodland

Acidic Talus Forest / Woodland	T - 46
Circumneutral Talus Forest / Woodland	T - 48
Calcareous Talus Forest / Woodland	T - 50

Central Hardwoods Region:

Mixed Coniferous – Deciduous Forest / Woodland:

Maritime Oak - Holly Forest / Woodland	T - 52
Coastal Forest / Woodland	T - 54
Pitch Pine - Oak Forest	T - 56
White Pine – Oak Forest	T - 58
Oak – Hemlock - White Pine Forest	T - 60

Conifer Forest / Woodland:

Successional White Pine Forest	T - 62
Hemlock Ravine	T - 78

Deciduous Forest / Woodland:

Mixed Oak Forest	T - 64
Ridgetop Chestnut Oak Forest / Woodland	T - 66
Black Oak - Scarlet Oak Forest / Woodland	T - 68
Oak - Hickory Forest	T - 70
Hickory – Hop Hornbeam Forest / Woodland	T - 72
Dry, Rich Acidic Oak Forest	T - 74
Yellow Oak Dry Calcareous Forest	T - 76

Northern Hardwoods Region:

Mixed Forest:

Northern Hardwoods – Hemlock – White Pine Forest	T - 80
Spruce – Fir – Northern Hardwood Forest.....	T - 92

Conifer Forest:

Hemlock Ravine	T - 78
High Elevation Spruce - Forest.....	T - 94

Deciduous Forest:

Successional Northern Hardwood Forest.....	T - 82
Red Oak – Sugar Maple Transition Forest.....	T - 84
Rich, Mesic Forest Community	T - 86
Forest Seep Community	T - 88
Calcareous Forest Seep Community.....	T - 90

Riverside Communities

Riverside Rock Outcrop	T - 16
Dry Riverside Bluff	T - 18
Floodplain Forests	See Palustrine Section

Maritime Salt Spray Zone:

.....	See also Estuarine Section
Maritime Rock Cliff	T - 20
Maritime Erosional Cliff	T - 22
Maritime Beach Strand	T - 24
Maritime Dune	T - 26
Coastal interdunal marsh/swale [Palustrine].....	P - 40
Sandplain Grassland.....	T - 28
Cultural Grassland	T - 30
Sandplain Heathland	T - 32
Maritime Shrubland	T - 34
Maritime Pitch Pine on Dunes	T - 36
Maritime Juniper Woodland / Shrubland.....	T - 38
Maritime Oak / Holly Forest / Woodland	T - 46

PALUSTRINE COMMUNITIES

PALUSTRINE INTRODUCTION.....	P - ii
------------------------------	--------

FORESTED WETLANDS

Conifer-dominated:

Spruce-fir boreal swamp	P - 2
Hemlock-hardwood swamp	P - 4
Atlantic white cedar swamps	
i. Coastal Atlantic white cedar swamp	P - 6
ii. Inland Atlantic white cedar swamp	P - 8
iii. Northern Atlantic white cedar swamp.....	P - 10
iv. Alluvial Atlantic white cedar swamp	P - 12
v. Atlantic white cedar bog.....	P - 14
Spruce-tamarack bog	P - 16

Hardwood-dominated:

Red maple swamp.....	P - 18
i. Alluvial red maple swamp	P - 20
Black ash swamp	P - 22
Black ash-red maple-tamarack calcareous seepage swamp.....	P - 24
Black gum-pin oak-swamp white oak “perched” swamp.....	P - 26
Black gum swamp.....	P - 28
Floodplain forests	
i. Major-river floodplain forest.....	P - 30
ii. Transitional floodplain forest.....	P - 32
iii. Small-river floodplain forest	P - 34
iv. High-terrace floodplain forest	P - 36
v. Cobble bar forest.....	P - 38

NON-FORESTED WETLANDS

Marshes/Wet meadows:

Coastal interdunal marsh/swale.....	P - 40
Deep emergent marsh.....	P - 42
Shallow emergent marsh.....	P - 44
Wet meadow.....	P - 46
i. Kettlehole wet meadow.....	P - 48

Pondshores/lakeshores:

Inland acidic pondshore/lakeshore.....	P - 50
Coastal plain pondshore.....	P - 52
Calcareous pondshore/lakeshore	P - 54

Riversides/Streamsides:

Mud flat.....	P - 56
Riverside seep.....	P - 58
Low-energy riverbank	P - 60
High-energy riverbank.....	P - 62
Riverine pointbar and beach	P - 64

Shrub swamps:

Shrub swamp	P - 66
-------------------	--------

Peatlands (bogs and fens):

Calcareous peatlands:

Calcareous sloping fen.....	P - 68
Calcareous seepage marsh	P - 70
Calcareous basin fen.....	P - 72

Acidic peatlands:

Acidic graminoid fen.....	P - 74
Acidic shrub fen.....	P - 76
Sea-level fen	P - 78
Level bog.....	P - 80
i. Kettlehole level bog.....	P - 82
ii. Highbush blueberry thicket	P - 84

Vernal pools:

Woodland vernal pool.....	P - 86
---------------------------	--------

ESTUARINE COMMUNITIES

MARINE

Marine Subtidal:

Flats.....	E - 2
------------	-------

Marine Intertidal:

Rocky Shore.....	E - 4
Gravel / Sand Beach	E - 6
Flats.....	E - 8

ESTUARINE

Estuarine Subtidal:

Saline / Brackish Flats	E - 10
Fresh / Brackish Flats	E - 12
Coastal Salt Pond	E - 14

Estuarine Intertidal:

Saline / Brackish Flats	E - 16
Fresh / Brackish Flats	E - 18
Coastal Salt Pond Marsh.....	E - 20
(Palustrine) Sea-level Fen.....	E - 22
Salt Marsh.....	E - 24
Brackish Tidal Marsh	E - 26
Freshwater Tidal Marsh.....	E - 28
Fresh / Brackish Tidal Shrubland	E - 30
Fresh / Brackish Tidal Swamp	E - 32

REFERENCES

APPENDIX A – Inventory Needs



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Introduction

The main purpose of this classification is to provide a useful framework for describing, inventorying, and tracking natural communities in Massachusetts. This natural community classification is biased to describe vegetation at a scale that is meaningful for conservation and land protection. A classification provides a convenient mechanism for reducing the complexity of natural vegetation to a relatively small number – 105 in this case – of somewhat homogeneous and relatively easily understood, but abstract and artificial, groups. Any classification requires somewhat arbitrary categories and lines between types and classifications differ on where the lines are drawn. Part of the reason for disseminating a draft is to encourage input into the categories and their delineations. Vegetation classifications are influenced by their intended use – the use of this one is for conservation, and indeed focuses on the uncommon.

To protect the components of biodiversity, their patterns of distribution and their current patterns of conservation need to be evaluated and tracked. One aspect of this is to evaluate the conditions and distribution of natural communities across the state. Tracking natural communities requires having knowledge of what they are. A beginning of knowing natural communities is to name and describe what is known and give a common parlance for discussing the communities. Such a framework also allows identification of what isn't as well known, and encourages focus on gathering that information.

Our intent is to describe communities that can be identified in the field and to accurately (if arbitrarily) divide the vegetation of Massachusetts into identifiable and useful categories. Terrestrial, Palustrine, and Estuarine communities are included; Aquatic communities have NOT been addressed in this classification. In this classification of natural communities, attempts have been made to use community names that are recognizable and meaningful to a broad conservation audience including writers of town open space plans, land managers, environmental reviewers and consultants, and ecologists doing field studies.

In defining the composition and structure of the community types, we have begun identifying variations within those community-types; further information on the variations may lead to further splitting or lumping of the identified types in later versions of the classification. In particular, there is a complex of communities dominated by oak trees and another group (inter-related) dominated by red maple. Increased data may lead to splitting these groups differently than they are now divided. Comments on this public draft should lead to refinements and improved descriptions of the community types. Suggestions on other community types that could be split or consolidated would be considered. Descriptions of types of cultural communities (plant communities planted and maintained by humans for direct use by humans or domesticated animals such as forest plantations, orchards, and pastures) could be expanded, but most are not of conservation focus, so will probably continue to be lumped into a few groups.

Many communities occur with others in mosaics that share conditions and processes, such as water flowing through a wetland complex with no one community-type independent of the others or the unifying conditions. Communities are most effective as units of conservation when the controlling ecological processes can be maintained or restored. Putting communities into the functional systems of which they are a part will be another step in the classification. For now, some of those ideas are addressed in the part of each community description under the header Environmental Conditions. Such functional systems are not actually the same as the hierarchy of a key - that is a rock cliff face may be found in a key under non-forested, open communities, but is found on the ground surrounded by forest.

The communities described here are in exemplary condition, the type communities: not all real communities meet the criteria of the abstract, but still qualify as that community type. Many actual communities are disturbed by nature or humans, some are in climatic, topographic, or geological conditions different from the idealized, and others occupy some middle ground between described communities. Because communities are made up of plant species that have individual responses to environmental variables, the communities described grade into other community-types. In addition, the role of land use history is very important in the location and definitions of natural communities in Massachusetts. Three hundred years of intense use of the land in the state appears to have had a homogenizing effect that overrides some of the

influences of climate and landscape position (for example, see Foster et al. 1998, and other papers from the Harvard Forest). Some of this homogenization of communities is reflected in the difficulty of defining distinct community types and in the prevalence of mid-successional species in many of the community descriptions, and in the actual community occurrences.

The community-types that are described here are parts of the habitat for the animal species that use them. Birds may nest in one type of community, feed in another, and then leave entirely. Other animals also move between community types for different needs. Generalist species might have individuals occurring in a variety of different communities types.

Despite the problems of classification, we do find recurrent groupings of plant species, and associated animals, that do share responses to environmental conditions. Species that have restricted ranges and particular environmental requirements are often used as indicators of the communities in which they occur. Other species are found in a range of conditions and are occur in a variety of community-types, so are less useful as indicators, although they may be characteristically present in a given community type. These natural groupings of species, or natural communities, tend to vary simultaneously in response to soil moisture gradients, temperature gradients, and nutrient gradients, in a multidimensional, rather than linear, way. Thus, there are southern and northern versions of dry to wet gradients, acidic to less acidic, and nutrient poor to nutrient rich communities, and all the other interactions as well. While not all the possible variations result in distinctly different communities, there is a lot of variation in the real world.

Relationship to other classifications

This classification focuses on the natural communities of Massachusetts, but they are closely related to the natural communities of the region and particularly the surrounding states. The Massachusetts community descriptions include lists of synonyms for the surrounding states, all of which have developed individual classifications for their natural communities. The Nature Conservancy (TNC) with the Association for Biodiversity Information (ABI), has been developing a classification for the region within the United States National Vegetation Classification (USNVC) system. We've included the USNVC/TNC synonyms for those who want more finely divided community-types – the TNC Associations. The accuracy of the cross-walk to the synonyms is variable in this draft. Synonymy with other state's classifications are, of course, confounded by geographic differences in species distributions in the states, as well as issues of different levels of definitions. Clarification of these is one goal for the more final version of the classification. We also include synonymy with the previously used names in Massachusetts, some of which are more broadly defined than in the current classification. Many of the cross-walks to the old Massachusetts classification (Rawinski 1984), especially for the northern forest types, lack precision. That is at least partially a result of the lack of clear boundaries between types.

Organization of the classification

This draft classification divides natural community types into three major sections: Terrestrial, Palustrine and Estuarine. The Tables of Contents of each section double as keys, but are not dichotomous. Within the sections, the structural dominance – growth form or physiognomy such as forest, shrubland, herbaceous, and open or sparsely vegetated – is used as a division of types. The forested categories in the terrestrial and palustrine sections are subdivided into evergreen, deciduous and mixed.

We used a significant presence of water as the definer of what was palustrine, and the presence of water with some salinity or tide for inclusion in the estuarine category. All tidally influenced communities are in the estuarine category whether the tidal water is saline or fresh. Salt spray communities not influenced by tides are treated as terrestrial.

Terrestrial: The vegetation of terrestrial communities is not significantly influenced by standing or moving water. The forested community types have more than about 25% tree canopy (50% in the palustrine section), which includes woodlands of USNVC/TNC and other classifications. If mature trees are absent, and if shrubs are present forming more than about a 25% shrub layer cover overall, the community is considered to be a shrubland. Herbaceous communities are relatively open communities with neither forest nor shrub

canopies and have more than about a 25% vegetated cover. Open or sparsely vegetated communities are divided by their substrate type, rock or sand for convenience.

Palustrine: The palustrine section of the Massachusetts natural community classification includes all freshwater, non-tidal wetlands dominated by trees, shrubs, or persistent emergents, including mosses and lichens. This definition is slightly different from Cowardin (1979) who also included small, shallow aquatic beds with submersed and floating-leaved aquatics, and tidal wetlands where salinity due to ocean-derived salts was less than 0.5%. In this draft Massachusetts' classification, submersed and floating leaved aquatics will be included in an as yet unwritten aquatic section, and all tidal wetlands are included in the estuarine section. The palustrine section does include riverside communities that receive annual or semi-annual overbank flooding, e.g. floodplain forests. High-terrace floodplain forests (although technically terrestrial communities) are included in the palustrine section in order to group them with other floodplain forest communities.

Estuarine: Estuarine communities are subject to varying salinity, tidal actions, and wind. Estuaries include tidal habitats and adjacent tidal wetlands in which ocean water is at least occasionally diluted by freshwater from the land. Estuarine areas extend landward and up streams to where oceanic salts (formally defined as above 0.5 ppt salinity in an annual average low flow period) or tides (including freshwater tidal areas) have an influence on the vegetation. Hyper salinity (compared to the ocean) may occur temporarily in some areas from evaporation (such as in salt ponds). The estuarine area extends off-shore to areas with freshwater influence on the seawater, called subtidal communities in this classification.

Species Nomenclature

The scientific and common names of organisms are intended to be consistent with the following:

Vascular plants:

Sorrie, Bruce A. and Paul Somers. 1999. The vascular plants of Massachusetts: a County Checklist, Massachusetts Division of Fisheries and Wildlife, Natural Heritage & Endangered Species Program. Westborough, MA.

Mammals:

Cardoza, James E. and Gwilym S. Jones. 1999. MassWildlife's State Mammal List. 4th Edition. Available only from <http://www.state.ma.us/dfwele/dfw/dfwmam.htm>

Birds:

Blodget, B.G. 1998. Checklist of the birds of Massachusetts. Massachusetts Division of Fisheries and Wildlife. Westborough, MA.

Reptiles and Amphibians:

Cardoza, James E. and Peter G. Mirick. 1999. List of the reptiles and amphibians of Massachusetts, 3rd edition. Massachusetts Division of Fisheries and Wildlife, Fauna of Massachusetts Series No. 3. Westborough, MA.

Request for information

This classification identifies as examples sites where the community-types can be found as occurrences, on lands with public access in Massachusetts. Our database does include sites on less accessible land. We are in the process of building our database to include good occurrences of all community-types, with the most common being tracked only by exemplary occurrences (definitions of exemplary are being developed for each community type), and the rarest being tracked by all known occurrences, with a sliding scale of rarity and quality between. We would like to ultimately know what types are on protected - conservation - land, and what types need further protection. Then, with the management and restoration knowledge also being developed and collected, we will be in a better position to continue to protect the biodiversity of Massachusetts. We are asking for examples of additional locations, or better locations of community types; this will not necessarily result in those locations becoming published information. See Appendix A for a list of estimated inventory needs by community type.

Management needs of communities are seldom well known. In the descriptions we have included some of the management issues identified by field biologists who have been to occurrences of the communities

described. We hope to encourage further discussions of the management needs of the described communities by raising the management issues for each type.

Refinement of described community types

This draft of the classification of the natural communities of Massachusetts was written in order to provide a basis for discussing and conserving diversity of the types of vegetation in the state. The primary aim is to describe natural communities of conservation interest in Massachusetts, while including all the vegetation of the state. The overall tendency in this classification is to lump rather than to split. However, communities that have been well-studied (e.g. floodplain forests, acidic peatlands, Atlantic white cedar swamps) are usually more finely divided. Mostly, though, the many vegetation associations occurring within broadly defined communities are not described separately. Instead, the variation in vegetation is included within the vegetation description field and referred to as Associations when known and considered subtypes. As more data are accumulated, more divisions and reorganization will undoubtedly occur.

This classification represents the best of our knowledge about Massachusetts' communities from the field data and literature that we have compiled to date. It is by no means complete or absolute. Instead, it should be regarded as a framework that can be field-tested and revised. Communities can be added, deleted, divided, or combined as we expand our knowledge of Massachusetts' natural communities. There are inconsistencies, some fields are incomplete, some community descriptions overlap. Any assistance with refining those issues would be helpful.

The plan is to collect data, have discussions with ecologists state-wide, and consider comments on this draft -- and to produce a more definitive classification. All comments, feedback, and community information are welcome and appreciated. Your help will greatly improve the result.

PAGE GUIDE

Community Name:	Name used to describe the community in Massachusetts
Community ELCODE:	Unique ten digit alphanumeric element code (ELCODE) assigned to the community.
SRANK:	Community state rank (SRANK) that reflects the community's rarity and threat within Massachusetts, with regard to its regional rarity and threat. The SRank system was developed for Natural Heritage programs by The Nature Conservancy. The SRANKs are as follows: S1= Typically 5 or fewer occurrences, very few remaining acres or miles of stream, or especially vulnerable to extirpation in Massachusetts for other reasons. S2= Typically 6-20 occurrences, few remaining acres or miles of stream, or very vulnerable to extirpation in Massachusetts for other reasons. S3= Typically 21-100 occurrences, limited acreage or miles of stream in Massachusetts. S4= Apparently secure in Massachusetts. S5= Demonstrably secure in Massachusetts. SU= Status unknown in Massachusetts.
Tracked:	Yes/No field. Yes means that the community is tracked in MNHESP's database. MNHESP tracks examples of communities that are ranked S1-S3. Communities that are ranked S4 or S5 generally are not tracked, except for exemplary occurrences. Some newly defined S3 communities (draft) are not yet tracked.

Map of the ecoregions and sub-ecoregions of Massachusetts:

Ecoregions (or ecological regions) are areas of relatively homogeneous ecological systems, including vegetation, soils, climate, geology, and patterns of human uses. Ecoregion boundaries have been developed for the United States to provide an ecological framework for inventorying and assessing environmental resources. Massachusetts falls within two ecoregions of the United States—the Northeastern Highlands and the Northeastern Coastal Zone. Sub-ecoregions of Massachusetts have been delineated (Figure 1; Griffith et al. 1994), and they are particularly useful for statewide ecological inventory and assessment activities, including vegetation classification.

There are thirteen sub-ecoregions in Massachusetts. Complete descriptions are given in Griffith et al. (1994), but a brief synopsis of their descriptions is given below:

Northeastern Highlands:

The *Taconic Mountains* sub-ecoregion is a hilly and mountainous region of western Massachusetts that includes Mt. Greylock, the highest elevation in the state (3491 feet). Streams are generally small and high-gradient, and there are few lakes. The vegetation is primarily northern hardwoods (maple-beech-birch) with spruce-fir at higher elevations. The *Western New England Marble Valleys*, also known as the Berkshire Valley, consists of calcitic and dolomitic marbles and limestones bedrock. Surface water alkalinity values in the area are the highest in Massachusetts ($>1000 \mu\text{eq/L}$; Griffith et al. 1994) due to the underlying limestone and marble. Alkaline groundwater results in mineral-rich and species-rich wetlands in the region, particularly calcareous fens. The Hoosic and Housatonic Rivers are the major drainages. The *Green Mountains/Berkshire Highlands* includes the southern extent of the Green Mountains and the Berkshire Hills; elevations range from 1000 to 2500 feet. Northern hardwoods and spruce-fir characterize the forested uplands. The Deerfield and upper Westfield Rivers are the main river basins. The *Lower Berkshire Hills* is similar to the Green Mountains/Berkshire Highlands sub-ecoregion except that it has an overall lower elevation, generally 1000 to 1700 feet. Spruce-fir is generally lacking, and northern hardwoods are mixed with transition hardwoods (maple-beech-birch, oak-hickory). Lakes and ponds are abundant compared to the rest of western Massachusetts. The *Berkshire Transition* ranges in elevation from 400-1400 feet, and forest types are transition hardwoods and northern hardwoods. Surface waters drain to the Westfield and Connecticut River basins. The *Vermont Piedmont* has a similar elevation range as the Berkshire Transition, but underlying limestone and marble result in surface waters with higher alkalinity ($500\text{-}1000 \mu\text{eq/L}$). Surface waters drain into the Deerfield and Connecticut River basins. The *Worcester/Monadnock Plateau* contains the most hilly and mountainous area of Massachusetts' central upland. Elevations range from 500 to 1400 feet with some peaks above 1800 feet (Mt. Watatic and Mt. Wachusett). Transition hardwoods are common, but

northern hardwoods also occur. Forested wetlands are common, and forested and non-forested peatlands are abundant. Surface waters are acidic with alkalinity values less than 50 $\mu\text{eq/L}$.

Northeastern Coastal Zone:

The *Connecticut Valley* is characterized by thick outwash, alluvial, and lake bottom deposits overlaying sedimentary bedrock. Surface water alkalinity values are generally above 500 $\mu\text{eq/L}$. Central hardwoods (oak-hickory) and transition hardwoods are the major forest types. The *Lower Worcester Plateau/Eastern Connecticut Upland* ranges in elevation from 500 to 1200 feet. The soils of the area developed primarily on glacial till in the uplands, and on stratified sand, gravel, and silt deposits in the valleys. Surface waters are acidic and drain primarily into the Chicopee and Quinebaug River systems. The *Southern New England Coastal Plains and Hills* is the largest sub-ecoregion in southern New England and is variable in its topography and bedrock. Bedrock types are mostly granites, schist and gneiss. Surface water alkalinity values are generally lower than in the Connecticut Valley, ranging from less than 50 to 500 $\mu\text{eq/L}$. Central hardwoods are dominant. The *Boston Basin* has low, rolling topography that is dominated by urban and suburban land. The *Narragansett Bristol Lowlands* are similar to the Coastal Plains and Hills, but bedrock outcrops are uncommon, and thick glacial till and outwash deposits cover the area. The lowlands are flat to gently rolling with elevations less than 200 feet. Surface water alkalinity values are generally between 100 to 300 $\mu\text{eq/L}$, but several areas have values less than 50 $\mu\text{eq/L}$. The vegetation is mostly central hardwoods. The *CapeCod/Long Island* sub-ecoregion is characterized by terminal moraines and outwash plains left by the glaciers, and by coastal deposits. The landscape is influenced by wind and water. Elevations are less than 200 feet. There is a moderate maritime climate, and stunted oak and pine forests are typical. Surface water alkalinity values are low (less than 50 $\mu\text{eq/L}$).

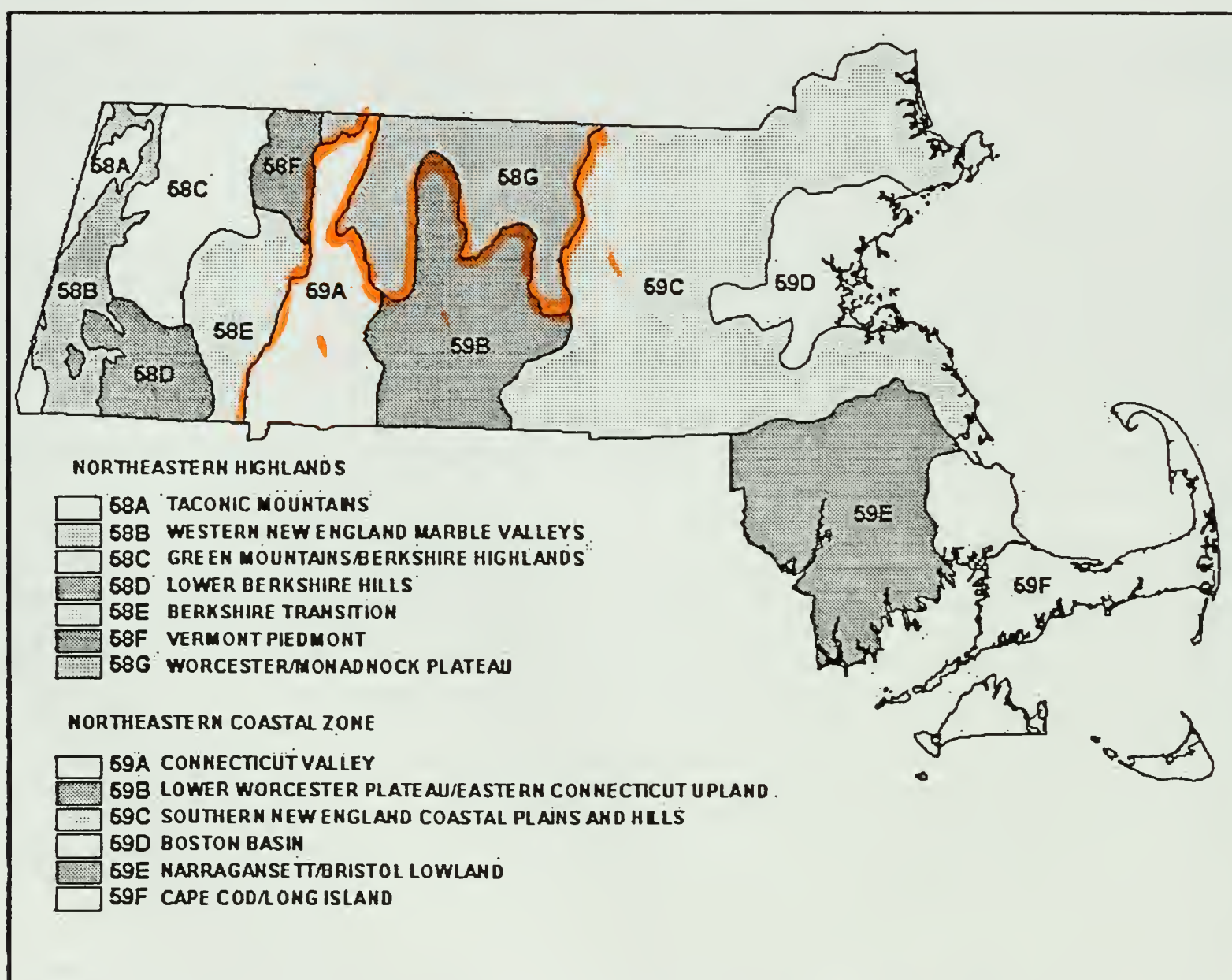


Figure 1. Ecoregions and sub-ecoregions of Massachusetts (Griffith et al. 1994)

In the vegetation classification, each community description is accompanied by a sub-ecoregion line map showing the sub-ecoregion boundaries. Sub-ecoregions in which the community type is known to occur (i.e. MNHESP has field data for the community including vegetation descriptions and/or plot data) are shaded in dark gray, and the sub-ecoregions with probable occurrences (i.e. field data are currently lacking but the community has been observed in the sub-ecoregion or the sub-ecoregion is known to have the appropriate physical conditions) are shaded in light gray. If the community is not believed to occur in a certain sub-ecoregion, then that sub-ecoregion is left white.

The community sub-ecoregion maps are intended to give the user an idea of where s/he may encounter a certain community type and also to identify sub-ecoregions for which community data are needed. Readers are encouraged to look in sub-ecoregions identified as having probable occurrences of the community (light gray). All new data and distribution information is welcome and much appreciated.

Concept:	Brief general description or word-picture of the community.
Environmental setting:	Detailed description of the landscape setting, soils, water chemistry, and other physical characteristics of the community.
Vegetation Description:	Detailed description of the vegetation structure and characteristic plant species of the community.
Associations:	List of the vegetation associations that have been described in Massachusetts that are either equivalent to the community or included within the community. For example, Motzkin (1991) described six Atlantic white cedar (AWC) associations in Massachusetts. Coastal AWC swamps are equivalent to his Coastal AWC type, while Inland AWC swamps include both his Mixed hemlock-AWC-red maple-yellow birch type and his Spruce-hemlock-AWC type.
Habitat values for: Associated Fauna	Description of the habitat that the community provides for animals, including birds, small mammals, amphibians, invertebrates, etc.
Associated rare plants:	A list of rare plants that are known to occur in the community type. Rare plants include those that are state-protected under the Massachusetts Endangered Species Act and those that are on the state watch list. Plants on the watch list are not legally protected, but they are believed to be uncommon or rare. They are species for which information is lacking on number of sites and severity of population decline, or species that have been delisted.

Plant Latin name	Plant common name	Plant state status E= State Endangered T= State Threatened SC= State Special Concern WL= State Watch List H= State Historic
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Associated rare animals:	A list of rare animals that are known to occur in the community type. Rare animals include those that are state-protected under the Massachusetts Endangered Species Act (birds on the bird watch list are also included). Format and abbreviations follow those used for Associated rare plants (see above).
Examples: OR Examples with Public Access:	List of representative examples of the community in areas with public access. For particularly sensitive communities, specific examples are not listed.
Threats:	A description of known threats to the community.
Management needs:	A description of management activities that may be necessary to maintain community occurrences and the quality of those occurrences.
Inventory need rank:	Each community is ranked from 1 to 3 based on its need for inventory efforts. Communities with high need (rank of 1) are lacking field data. Little is known about their abundance, distribution, physical setting, or species composition. They are the highest priority for field work. Communities ranked 3 have low need for inventory; these communities have recently been investigated in detail including statewide landscape analyses and vegetation classification.
Inventory comments:	Written comments providing specifics on the inventory needs of the community.

Synonyms:	Names used for the Massachusetts community in other natural community classifications. If a synonym is listed without any modifier, then the Massachusetts community is basically equivalent to the synonym. Sometimes the following modifiers are used: “includes” means that the Massachusetts community includes the communities listed, “included within” means that the Massachusetts community is included within the community listed, “similar to” means that the Massachusetts community is similar but not equivalent to the communities listed, and “not described” is used when the Massachusetts community has no synonym in that classification. Question marks indicate uncertainty about synonyms.
USNVC/TNC:	Synonyms in the National Vegetation Classification. Sneddon, L., M. Anderson, and J. Lundgren eds. 1998. International classification of ecological communities: terrestrial vegetation of the Northeastern United States (July 1998 working draft). The Nature Conservancy, Eastern Conservation Science and Natural Heritage Programs of the northeastern U.S. Boston, MA. [Association codes are written in brackets.]
MA (old name):	Old name used by the Massachusetts Natural Heritage Program. Rawinski, T.J. 1984. New England natural community classification. The Nature Conservancy, Eastern Regional Office, Boston, MA. [old EOCODES are written in brackets].
ME:	Synonyms in the Maine vegetation classification. Maine Natural Heritage Program. 1991. Natural Landscapes of Maine: A Classification of Ecosystems and Natural Communities. Department of Economic and Community Development, State House Station 130, Augusta, ME.
VT:	Synonyms in the Vermont vegetation classification. Thompson, E. 1995. Natural Communities of Vermont: Uplands and Wetlands. Vermont Nongame and Natural Heritage Program, Department of Fish and Wildlife, Agency of Natural Resources. Waterbury, VT.
NH:	Synonyms in the New Hampshire vegetation classification. Sperduto, D.D. 1994. A Classification of the Natural Communities of New Hampshire. New Hampshire Natural Heritage Inventory, Dept. of Resources and Economic Development. Concord, NH. (used for palustrine) AND Sperduto, D.D. 1997. The Natural Communities of New Hampshire: A Guide and Classification. Draft. November 21, 1997. New Hampshire Natural Heritage Inventory, Dept. of Resources and Economic Development. Concord, NH.
NY:	Synonyms in the New York vegetation classification. Reschke, C. 1990. Ecological Communities of New York State. New York Natural Heritage Program, N.Y.S. Dept. of Environmental Conservation. Latham, NY.
CT:	Synonyms in the Connecticut vegetation classification. Metzler, K.J. & J.P. Barrett. 1996. Vegetation classification for Connecticut, Organized into the modified UNESCO hierarchy. Draft report, Connecticut Natural Diversity Database. Hartford, CT.
RI:	Synonyms in the Rhode Island vegetation classification. Enser, R. 1995. Natural Communities of Rhode Island. Rhode Island Natural Heritage Program, Providence, RI.
Golet & Larson, 1974:	Synonyms in Golet, F.C. and J.S. Larson. 1974. Classification of freshwater wetlands in the glaciated Northeast. US Fish and Wildlife Service Resource Publication 116, Washington D.C. [Used in Palustrine section.]
Weatherbee:	Synonyms in Weatherbee, P.B. 1996. Flora of Berkshire County. The Berkshire Museum, The Studley Press, Inc. Dalton, MA. 123 pp. [Used in Terrestrial section.]
Other:	Synonyms in other miscellaneous vegetation classifications.
Author:	Person responsible for writing community description. Date: Date last revised.

DRAFT

**Descriptions of
Terrestrial communities**

DRAFT

**Classification of
Natural Communities
of
Massachusetts**

TERRESTRIAL COMMUNITIES

OPEN (sparse vegetation, less than about 25% tree, shrub, and herbaceous cover)

Rock Substrate:

Summits and Rock Outcrops

Acidic Rocky Summit / Rock Outcrop	T - 2
Circumneutral Rocky Summit / Rock Outcrop	T - 4
Calcareous Rocky Summit / Rock Outcrop	T - 6
Serpentine Outcrop	T - 8
Riverside Rock Outcrop	T - 16

Rock Cliff

Acidic Rock Cliff.....	T - 10
Circumneutral Rock Cliff.....	T - 12
Calcareous Rock Cliff.....	T - 14
Maritime Rock Cliff	T - 20

Unconsolidated Substrate:

Maritime Erosional Cliff	T - 22
Maritime Beach Strand	T - 24
Maritime Dune	T - 26

HERBACEOUS (dominated by herbaceous vegetation, with less than about 25% tree and shrub cover)

Dry Riverside Bluff	T - 18
Sandplain Grassland.....	T - 28
Cultural Grassland.....	T - 30

SHRUB communities (less than about 25% tree canopy)

Sandplain Heathland	T - 32
Maritime Shrubland	T - 34
Maritime Pitch Pine on Dunes	T - 36
Maritime Juniper Woodland / Shrubland.....	T - 38
Scrub Oak Shrubland	T - 40
Pitch Pine - Scrub Oak Community (may be more than 25% pitch pine)	T - 42
Ridgetop Pitch Pine - Scrub Oak Community (may be more than 25% pitch pine).....	T - 44

FOREST / WOODLAND (Greater than about 25% tree cover)

Talus Forest / Woodland

Acidic Talus Forest / Woodland	T - 46
Circumneutral Talus Forest / Woodland.....	T - 48
Calcareous Talus Forest / Woodland.....	T - 50

Central Hardwoods Region:

Mixed Coniferous – Deciduous Forest / Woodland:

Maritime Oak - Holly Forest / Woodland	T - 52
Coastal Forest / Woodland	T - 54
Pitch Pine - Oak Forest	T - 56
White Pine – Oak Forest	T - 58
Oak – Hemlock - White Pine Forest.....	T - 60

Conifer Forest / Woodland:

Successional White Pine Forest	T - 62
Hemlock Ravine	T - 78

Deciduous Forest / Woodland:

Mixed Oak Forest	T - 64
Ridgetop Chestnut Oak Forest / Woodland	T - 66
Black Oak - Scarlet Oak Forest / Woodland	T - 68
Oak - Hickory Forest	T - 70
Hickory – Hop Hornbeam Forest / Woodland	T - 72
Dry, Rich Acidic Oak Forest	T - 74
Yellow Oak Dry Calcareous Forest.....	T - 76

Northern Hardwoods Region:

Mixed Forest:

Northern Hardwoods – Hemlock – White Pine Forest.....	T - 80
Spruce – Fir – Northern Hardwood Forest	T - 92

Conifer Forest:

Hemlock Ravine.....	T - 78
High Elevation Spruce - Forest	T - 94

Deciduous Forest:

Successional Northern Hardwood Forest	T - 82
Red Oak – Sugar Maple Transition Forest	T - 84
Rich, Mesic Forest Community.....	T - 86
Forest Seep Community.....	T - 88
Calcareous Forest Seep Community	T - 90

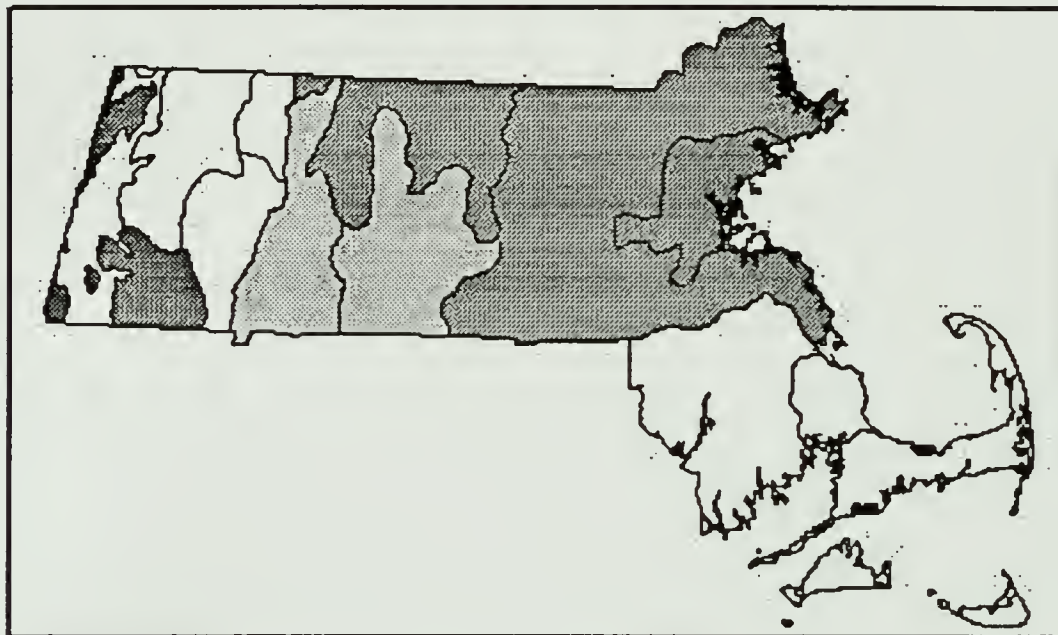
Riverside Communities

Riverside Rock Outcrop	T - 16
Dry Riverside Bluff	T - 18
Floodplain Forests.....	See Palustrine Section

Maritime Salt Spray Zone:

.....	See also Estuarine Section
Maritime Rock Cliff	T - 20
Maritime Erosional Cliff	T - 22
Maritime Beach Strand.....	T - 24
Maritime Dune	T - 26
Coastal interdunal marsh/swale [Palustrine]	P - 40
Sandplain Grassland	T - 28
Cultural Grassland	T - 30
Sandplain Heathland	T - 32
Maritime Shrubland.....	T - 34
Maritime Pitch Pine on Dunes.....	T - 36
Maritime Juniper Woodland / Shrubland	T - 38
Maritime Oak / Holly Forest / Woodland.....	T - 46

Community Name: **ACIDIC ROCKY SUMMIT / ROCK OUTCROP**
 Community Code: CT2A1A0000
 SRANK: S4
 Tracked: No



- Concept:** A widespread, open, community of low shrubs, scattered grasses, mosses, lichens and occasional trees found on rocky summits with exposed acidic bedrock or on rock outcrops where bedrock is acidic.
- Environmental Setting:** This community is found on rocky summits (balds) or ridge tops with exposed acidic bedrock or on rock outcrops derived from acidic bedrock. These areas are characteristically dry, with little or no soil and can often be found as open patches within the ridge-top pitch pine or dry, mixed oak communities. Although it can be found on flat surfaces, it is more typically found on steep slopes with aspects varying from SE through SW. Vegetation is concentrated around the edges or is found in pockets of soil within the outcrop. Ridgetop Pitch Pine / Scrub Oak Communities, or other ridgetop communities are often around the open patches of the Acidic Rocky Summit / Rock Outcrop Community. Examples of the Acidic Rock Cliff Community may occur below rocky summits, sometimes with intervening ridgetop or other forest/ woodlands.
- Vegetation Description:** Low shrubs and scattered clumps of grass dominate this community. Vegetation is discontinuous. The exposed rocks often have extensive patches of lichen and moss. Canopy cover is largely absent but trees commonly found near the margin of the bedrock areas include pitch pine (*Pinus rigida*), white pine (*Pinus strobus*), and red oak (*Quercus rubra*), and may also include Red Pine (*Pinus resinosa*) native in this habitat. The dominant shrubs include scrub oak (*Quercus ilicifolia*), huckleberry (*Gaylussacia baccata*), early sweet blueberry (*Vaccinium pallidum*), low sweet blueberry (*V. angustifolium*), black chokecherry (*Aronia melanocarpa*), and dwarf serviceberry (*Amelanchier stolonifera*). Dwarf chestnut oak (*Q. prinoides*) can also be found, but not as commonly. Herbaceous species include little bluestem (*Schizachyrium scoparium*), poverty grass (*Danthonia spicata*), common hair grass (*Deschampsia flexuosa*), Pennsylvania sedge (*Carex pensylvanica*), pale corydalis (*Corydalis sempervirens*), and cow wheat (*Melampyrum lineare*).
- Associations:**
- Habitat Values for Associated Fauna:** Most animals of rock outcrop communities are not sensitive to the chemistry of the rock, but rather are responding to the elevation and dryness of the habitat. Any differences in resident fauna between calcareous and acidic outcrops are most likely due to geographical differences in species distribution rather than to qualitative differences among the types of outcrops. Outcrops tend to be fairly small, and only a part of the habitat of most vertebrate animals. Small mammals of rock outcrop communities include those of dry habitats such as white footed mouse (*Peromyscus leucopus*), red-backed vole (*Clethrionomys gapperi*), short-tailed shrew (*Blarina brevicauda*) and, in grassy / sedgy areas with some soil accumulation, meadow voles (*Microtus pennsylvanicus*). Snakes would be those of dry areas, such as black racer (*Coluber constrictor*), ringneck (*Diadophis punctatus*), and redbelly snake (*Storeria*

occipitomaculata). No turtles, frogs or toads would be expected. Ravens (*Corvus corax*) are all around high elevations, especially near cliffs where they nest.

Associated Rare Plants:

NONE KNOWN

Associated Rare Animals:

ERORA LAETA

EARLY HAIRSTREAK

T

**Examples with
Public Access:**

Mt. Everett State Reservation – Mt. Washington; Mt. Greylock State Reservation. – Williamstown;
Mt. Tekoa WMA – Westfield/Russell; Blue Hills Reservation – Milton.

Threats:

The major threat is probably the use of the areas as viewpoints. This can destroy the vegetation by trampling. The larger and steeper areas where the community occurs are probably stable and not likely to be overgrown by trees. Smaller areas may be overgrown during succession.

Management Needs:

Build trails to avoid these areas and/or educate the public so they understand how to protect the fragile areas. Controlled burns may be useful in keeping areas open.

Inventory Need Rank:

2

Inventory Comments:

This community may occur on Mt. Wachusett or in other parts of the state.

Synonyms:

USNVC/TNC:

In part *Vaccinium* (*angustifolium*, *myrtilloides*, *pallidum*) dwarf -Shrubland Alliance – *Vaccinium angustifolium* - *Sorbus americana* Dwarf - Shrubland [CEGL005094]; *Danthonia spicata* Herbaceous Alliance (possible, no associations defined for New England); *Pinus strobus*- *Quercus* (*alba*, *rubra*) wooded herbaceous Alliance – *Pinus strobus* - *Quercus rubra* / *Danthonia spicata* Acid Bedrock Wooded Herbaceous Vegetation [CEGL005101]; in part *Pinus rigida* Woodland Alliance – *Pinus rigida* /*Aronia melanocarpa* / *Deschampsia flexuosa* - *Schizachyrium* Woodland [CEGL006116].

MA (old name):

SNE Acidic Rocky Summit/Rock Outcrop Community.

ME:

In part, Acidic summit Community.

NH:

Included in: Appalachian oak- pine Rocky ridge Woodlands/ barren; Southern Acidic Rocky Summit Community and Oak - Pine Rocky Summit Woodland Community.

VT:

Temperate Acidic Outcrop Community, and in part - Boreal Outcrop Community.

NY:

In part - Rocky summit grassland; Successional Blueberry heath.

CT:

Includes: *Schizachyrium scoparium* - *Danthonia spicata* Grasslands - rock summits – *S. scoparium*/ *Prunus pumila* var. *cuneata* community; and *S. scoparium*/ *Hypericum gentianoides* Community. [ridgetops].

RI:

Not described.

Weatherbee:

In part, Southern Acidic Rocky Summit.

Author:

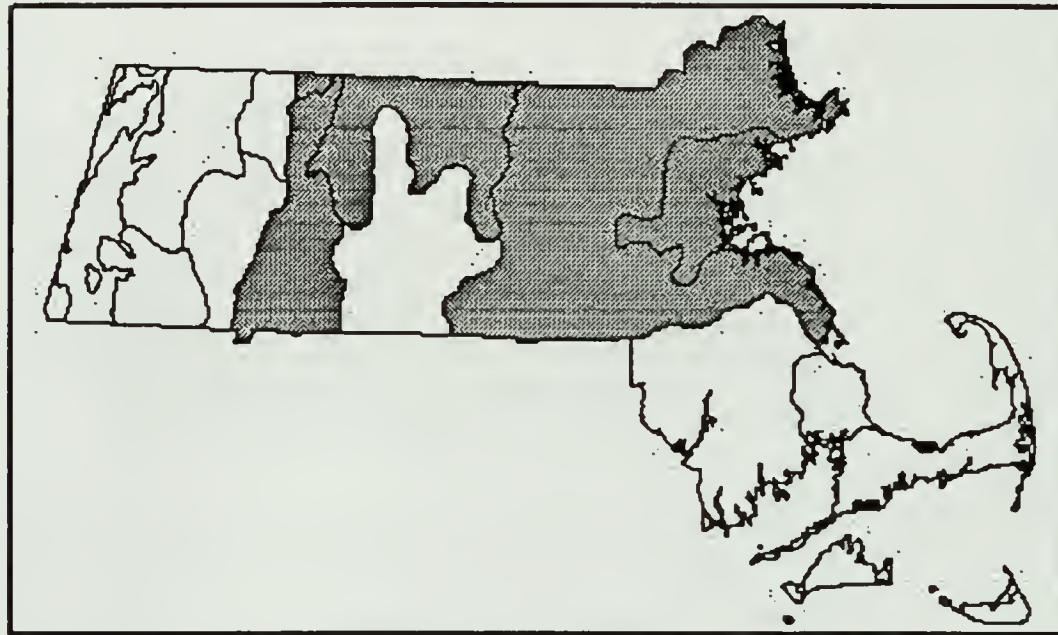
Karen Searcy

Date:

3/28/00

modified PCS

Community Name: CIRCUMNEUTRAL ROCKY SUMMIT/ ROCK OUTCROP COMMUNITY
 Community Code: CT2A1B0000
 SRANK: S2S3



- Tracked:** Yes
- Concept:** An open community of grasses, sedges and herbaceous plants occurring on rocky summits, ridges or outcrops where the exposed bedrock is circumneutral.
- Environmental Setting:** This community is found on traprock ridges where it occurs on open ridge tops or steep slopes where the traprock is exposed. It is found on slopes facing SE through SW. These relatively small open areas are often found within an oak forest matrix near hickory-hop hornbeam communities with which it shares a number of herbaceous species. The community is also found on other types of circumneutral substrates such as conglomerate. The Circumneutral Rocky Summit / Rock Outcrop Community grades into the Circumneutral Rock Cliff Community near cliffs. Both types of sites are dry with soil confined to cracks in the rock.
- Vegetation Description:** Grasses, sedges and forbs dominate this community. Occasional isolated trees of eastern red cedar (*Juniperus virginiana*), shagbark hickory, (*Carya ovata*), sweet pignut hickory (*Carya glabra*/C. *ovalis*), and white ash (*Fraxinus americana*) can also be found, so that some examples have an open, savanna like appearance. The exposed rock is often covered with lichen, and mosses (*Polytrichum* spp.). Except for the Carolina rose (*Rosa carolina*) and bearberry (*Arctostaphylos uva-ursi*), which are found on a number of sites, shrubs, including the less common hackberry (*Celtis occidentalis* var. *pumila*), are usually restricted to the edge of the openings. The herb layer can be patchy, occupying area between outcrops of rocks or can be almost continuous where rocks are broken. Dominant species include Pennsylvania sedge, (*Carex pensylvanica*), parasol-sedge (*C. umbellata*), poverty grass (*Danthonia spicata*), and little blue stem grass (*Schizachyrium scoparium*). Other species typically encountered include rusty cliff fern (*Woodsia ilvensis*), rock spikemoss (*Selaginella rupestris*), early saxifrage (*Saxifraga virginensis*), arrow leaved violet (*Viola sagittata*), dry land bittercress (*Cardamine parviflora*), skunk meadow-rue (*Thalictrum revolutum*), strawberry (*Fragaria virginiana*), dwarf dandelion (*Krigia virginica*), pale corydalis (*Corydalis sempervirens*), sleepy catch fly (*Silene antirrhina*), Venus's looking glass (*Triodanis perfoliata*), blue curls (*Trichostema dichotoma*), several species of goldenrods (*Solidago bicolor*, *S. nemoralis*) and other grasses (such as *Aristida dichotoma*, *Panicum* spp., and *Sorghastrum nutans*).
- Associations:**
- Habitat Values for Associated Fauna:** Most animals of rock outcrop communities are not sensitive to the chemistry of the rock, but rather are responding to the elevation and dryness of the habitat. Any differences in resident fauna between calcareous and acidic outcrops are most likely due to geographical differences in species distribution rather than to qualitative differences among the types of outcrops. Outcrops tend to be fairly small, and only a part of the habitat of most vertebrate animals. Small mammals of rock outcrop communities include those of dry habitats such as white footed mouse (*Peromyscus leucopus*), red-backed vole

(*Clethrionomys gapperi*), short-tailed shrew (*Blarina brevicauda*) and, in grassy/sedgy areas with some soil accumulation, meadow voles (*Microtus pennsylvanicus*). Snakes would be those of dry areas, such as black racer (*Coluber constrictor*), ringneck (*Diadophis punctatus*), and redbelly snake (*Storeria occipitomaculata*). No turtles, frogs or toads would be expected. Ravens (*Corvus corax*) are all around high elevations, especially near cliffs where they nest. Invertebrates include tiger beetles.

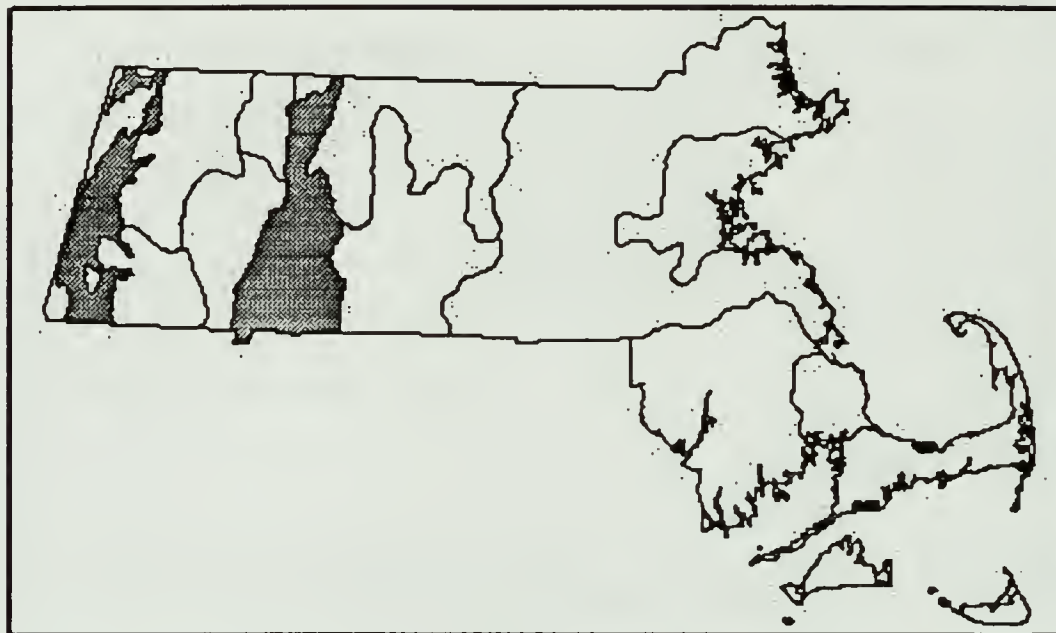
Associated Rare Plants:

ARABIS MISSOURIENSIS	GREEN ROCK-CRESS	T
ASCLEPIAS VERTICILLATA	LINEAR-LEAVED MILKWEED	T
MINUARTIA MICHAUXII	MICHAUX'S SANDWORT	SC
POLYGONUM TENUE	ROCK KNOTWEED	- WL
RANUNCULUS FASCICULARIS	EARLY BUTTECUP	- WL
RANUNCULUS MICRANTHUS	TINY-FLOWERED BUTTERCUP	T
VERBENA SIMPLEX	NARROW-LEAVED VERVAIN	E

Associated Rare Animals:

Examples with Public Access:	Prospect Hill Park – Waltham; Mt. Sugarloaf State Reservation – Deerfield; Mt. Holyoke Range State Park - Amherst, South Hadley and Granby; Mt. Tom State Reservation – Holyoke.
Threats:	The major threats are trampling and other uses by people. Succession appears to be proceeding slowly, if at all, on many of these sites. However, grazing and possibly fire may contribute to helping keep the areas. Most sites that are not too steep have evidence of deer browse..
Management Needs:	Trails should be kept away from these areas because readily accessible sites are used as view-points and picnic areas. Planning of trails should take the fragility of the sites into consideration.
Inventory Need Rank:	3
Inventory Comments:	Sites supporting this community may be found along the Mohawk Trail (<i>Rte. 2</i>) in Shelburne and at Bardwell's Ferry in Shelburne but should probably be checked.
Synonyms:	
USNVC/TNC:	Juniperus virginiana Woodland Alliance – Juniperus virginiana - Fraxinus americana / Danthonia spicata - Poa compressa Woodland [CEGL006002]; in part - Quercus rubra- Q. prinus Woodland Alliance – Quercus rubra- Q. prinus -Pinus strobus / Penstemon hirsutus Woodland [CEGL006074] and – Quercus rubra- Q. prinus / Vaccinium spp. - Deschampsia Woodland [CEGL006134].
MA (old name):	SNE CIRCUMNEUTRAL ROCKY SUMMIT/ROCK OUTCROP COMMUNITY
ME:	Circumneutral Summit Community
NH:	Circumneutral rocky summit and Red Pine Rocky summit Woodland Community
VT:	Included in Temperate acidic outcrop community
NY:	Red Cedar Rocky Summit; in part - Rocky summit grassland
CT:	Juniperus virginiana Woodlands; Schizachyrium scoparium- Danthonia spicata Grasslands- ridgetops – S. scoparium/ H. gentianoides
RI:	Red Cedar Rocky Summit
Weatherbee:	Within Southern Acidic Rocky Summit Community
Author:	Karen Searcy
Date:	3/28/00

Community Name: **CALCAREOUS ROCKY SUMMIT / ROCK OUTCROP**
 Community Code: CT2A1C0000
 SRANK: S2
 Tracked: Yes



Concept: An open community of shrubs and herbaceous plants occurring on open calcareous ridge tops of the low hills edging the valleys in the Western New England Marble Valleys eco-region as well as steep, mid-slope calcareous ledges found in the same region.

Environmental Setting: Ridge top calcareous outcrops are dry and typically are found on the ridge tops of low hills in the calcareous regions of Berkshire County. Their open aspect is maintained by trees uprooting and pulling away from the steep ridge top areas. Because, most calcareous bedrock in Massachusetts is overlain by more resistant acidic rocks, the community tends to be found on rock outcrops rather than actual rocky summits. The substrate grades from rock outcrops to steeper, but moister, shaded cliff faces which support Calcareous Cliff Communities.

Vegetation Description: The ridge top community supports relatively sparse herbaceous vegetation that includes ivory sedge (*Carex eburnea*), purple clematis (*Clematis occidentalis*), long-leaved bluet (*Hedyotis longifolia*), balsam groundsel (*Senecio pauperculus*) and lyre-leaved rock-cress (*Arabis lyrata*). Shrubs include round-leaved dogwood (*Cornus rugosa*), roundleaf shadbush (*Amelanchier sanguinea*) as well as the less common northern prickly rose (*Rosa acicularis*), hairy honeysuckle (*Lonicera hirsuta*) and downy arrowwood (*Viburnum rafinesquianum*). Calcareous rock outcrop off the summit ridges tend to be moister and are lightly shaded by trees characteristic of rich mesic forests including sugar maple (*Acer saccharum*), white ash (*Fraxinus americana*), and hop-hornbeam (*Ostrya virginiana*). The herbaceous layer can include species characteristic of rich mesic forests but typically has a high proportion of ferns such as bulblet fern (*Cystopteris bulbifera*), fragile fern (*C. tenuis*), ebony spleenwort (*Asplenium platyneuron*), maidenhair spleenwort (*A. trichomanes*), walking fern (*Asplenium rhizophyllum*) and blunt lobed wood fern (*Woodsia obtusa*) as well as the rarer ferns, purple cliff-break (*Pellaea atropurpurea*) and wall rue spleenwort (*Asplenium ruta-muraria*). Other plants that are frequently found on these ledges include ivory sedge (*Carex eburnea*), Pennsylvania sedge (*Carex pensylvanica*), harebell (*Campanula rotundifolia*), peduncled sedge (*Carex pedunculata*), early saxifrage (*Saxifraga virginensis*), lyre-leaved rock-cress (*Arabis lyrata*), smooth rock-cress (*A. laevigata*), columbine (*Aquilegia canadensis*) and balsam groundsel (*Senecio pauperculus*).

Associations:

Habitat Values for Associated Fauna:

Most animals of rock outcrop communities are not sensitive to the chemistry of the rock, but rather are responding to the elevation and dryness of the habitat. Any differences in resident fauna between calcareous and acidic outcrops are most likely due to geographical differences in species distribution rather than to qualitative differences among the types of outcrops. Calcareous outcrops are in the western part of Massachusetts, and so have the species that don't occur in coastal areas such as deer mouse (*Peromyscus maniculatus*), woodland jumping mouse (*Napaeozapus insignis*), and smoky shrew (*Sorex fumeus*), as well as other, more widespread small mammals of dry habitats. Outcrops tend to be

fairly small, and only a part of the habitat of most vertebrate animals. Snakes are those of dry areas, such as black racer (*Coluber constrictor*), ringneck (*Diadophis punctatus*), and redbelly snake (*Storeria occipitomaculata*). No turtles, frogs or toads would be expected. Ravens (*Corvus corax*) are all around high elevations, especially near cliffs where they nest. Invertebrates include tiger beetles.

Associated Rare Plants:

AMELANCHIER SANGUINEA	ROUNDLEAF SHADBUSH	SC
ARABIS LAEVIGATA	SMOOTH ROCK-CRESS	T
ARABIS LYRATA	LYRE-LEAVED ROCK-CRESS	T
ASPLENIUM RUTA-MURARIA	WALL-RUE SPLEENWORT	T
CHAMAELIRIUM LUTEUM	DEVIL'S-BIT	E
CLEMATIS OCCIDENTALIS	PURPLE CLEMATIS	SC
HOUSTONIA LONGIFOLIA VAR LONGIFOLIA	LONG-LEAVED BLUET	T
LONICERA HIRSUTA	HAIRY HONEYSUCKLE	E
MINUARTIA MICHAUXII	MICHAUX'S SANDWORT	SC
PELLAEA ATROPURPUREA	PURPLE CLIFF-BRAKE	- WL
ROSA ACICULARIS	NORTHERN PRICKLY ROSE	E
SELAGINELLA RUPESTRIS	ROCK SPIKEMOSS	- WL
TRICHOSTEMA BRACHIATUM	FALSE PENNYROYAL	E
VIBURNUM RAFINESQUIANUM	DOWNY ARROWWOOD	T

Associated Rare Animals:

NONE KNOWN

Examples with Public Access: Bartholomew's Cobble (TTOR) – Sheffield; Bashbish Falls State Park – Mt. Washington.

Threats: These communities can be threatened by development and by invasive species. This community has a number of non-native invasives including Morrow's honeysuckle (*Lonicera morrowii*), Japanese barberry (*Berberis japonica*), and multiflora rose (*Rosa multiflora*).

Management Needs: Control of invasive species.

Inventory Need Rank: 2

Inventory Comments:

Synonyms:

USNVC/TNC: Includes: Juniperus virginiana Woodland Alliance – Juniperus virginiana- Ostrya virginiana / Carex eburnea Woodland [CEGL006180]; Includes part of: Juniperus virginiana - Quercus muehlenbergii Woodland Alliance – Juniperus virginiana var. virginiana - Quercus muehlenbergii Woodland [CEGL003757] [Provisional]; Possibly - Schizachyrium scoparium - Bouteloua curtipendula evergreen or mixed wooded herbaceous Alliance – Juniperus virginiana / Bouteloua curtipendula - Carex eburnea Wooded Herbaceous Vegetation [CEGL006047].

MA (old name): SNE Calcareous Rocky summit/ Rock Outcrop Community.

ME: Not described.

NH: 1997 - includes Rich [basic] Rocky ridge (Juniperus horizontalis); 1994 - part of Calcareous rocky summit/rock outcrop community, part of calcareous cliff community.

VT: Calcareous Outcrop Community.

NY: Includes: Red Cedar Rocky Summit; Includes parts of - Rocky summit grassland; Calcareous talus slope woodland; Calcareous pavement barrens.

CT: Includes: Juniperus virginiana Woodlands; Includes a community similar to: Schizachyrium scoparium-Bouteloua curtipendula temperate Grasslands.

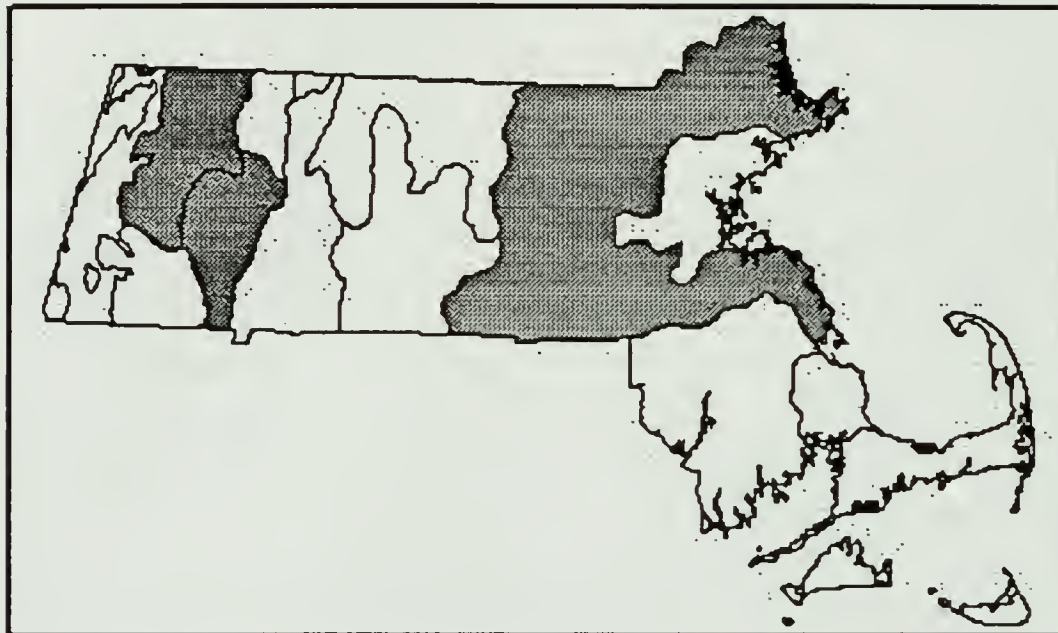
RI: Includes: Red Cedar Rocky summit.

Weatherbee: Southern calcareous rocky summit.

Author: Karen Searcy

Date: 3/28/00

Community Name: SERPENTINE OUTCROP COMMUNITY
 Community Code: CT2A1D0000
 SRANK: S1
 Tracked: Yes



- Concept:** Open, sparse herbaceous vegetation with little tree or shrub growth, generally under an acre in size; often with markedly different vegetation than in surrounding areas. Tree canopy is often only from surrounding forest: woody species growing on serpentine
- Environmental Setting:** Usually on small exposed ledges or outcrops of serpentine or other ultramafic [igneous rocks with high percentages of magnesium, often accompanied by iron, chromium and nickel] bedrock, or shallow soil over such bedrock. The soils derived from ultramafic rocks present unusual growing conditions that inhibits growth of many plants: low levels of necessary nutrients, relatively high concentrations of magnesium, and droughty conditions of thin soil over rock. Deeper soils derived from glacial deposits over serpentine, or ultramafic, bedrock do not support a serpentine outcrop community.
- Vegetation Description:** Large leaved sandwort (*Moehringia macrophylla*) is an absolute indicator of serpentine conditions, but does not occur in all locations. Field chickweed (*Cerastium arvense*) is most abundant on serpentine outcrops, but also occurs in open woods on south-facing slopes. Serpentine areas typically are sparsely vegetated, have increased (relative to surrounding areas) dry adapted plants, and presence of some calcifiles. The vegetation is often a graminoid-savanna in larger occurrences (in Maryland, for example); in Massachusetts the occurrences are very small, and surrounding vegetation dominate most sites. In forest areas, white pine (*Pinus strobus*), hemlock (*Tsuga canadensis*), red maple (*Acer rubrum.*), red oak (*Quercus rubra*), and birches (*Betula papyrifera* and *B. alleghaniensis*) form a canopy, with witch-hazel (*Hamamelis virginiana*) in a sparse shrubs layer. Other associated species include bracken fern (*Pteridium aquilinum*), maidenhair spleenwort (*Asplenium trichomanes*) and grasses. Species considered somewhat calcifilic, such as columbine (*Aquilegia canadensis*), harebell (*Campanula rotundifolia*) and rock spike-moss (*Selaginella rupestris*) are sometime present.
- Associations:**
- Habitat Values for Associated Fauna:** The Massachusetts serpentine areas are not large enough to affect larger herbivores, but small animals may be scarcer than normal. Plant cover is generally sparse, leading to less cover and food for animals. Porcupines are frequent in the canopy trees.
- Associated Rare Plants:**
- | | | |
|------------------------|-----------------------|---|
| MOEHRINGIA MACROPHYLLA | LARGE-LEAVED SANDWORT | T |
|------------------------|-----------------------|---|
- Associated Rare Animals:**
- NONE KNOWN

Examples with Public Access: None known on public land in Massachusetts

Threats:

Management Needs:

Inventory Need Rank: 3

Inventory Comments: Visits to known sites for community descriptions would be useful.

Synonyms:

USNVC/TNC: Includes part of *Cerastium arvense* sparsely vegetated Alliance – *Adiantum aleuticum* - *Asplenium* spp. - *Cerastium arvense* Sparse Vegetation [CEGL006104].

MA (old name): SNE Serpentine Outcrop Community.

ME: Serpentine Outcrop Community.

NH: soils are usually stunted.

VT: Serpentine Outcrop.

NY: Similar to: Serpentine barrens.

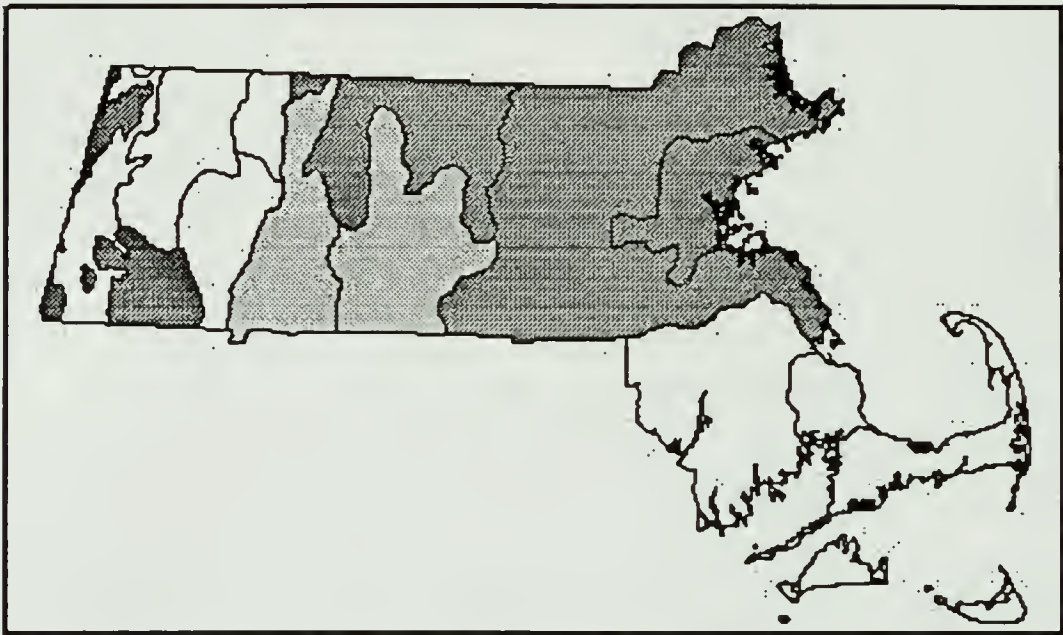
CT:

RI:

Weatherbee: Serpentine Outcrop Community.

Author: P. Swain **Date:** 3/28/00

Community Name: ACIDIC ROCK CLIFF COMMUNITY
Community Code: CT2A2A2000
SRANK: S4
Tracked: No



Concept: An open community of extremely sparse scattered vascular plants on ledges and in crevices within a sparsely vegetated vertical substrate of acidic rocks. Lichens are occasionally dense on the cliff face.

Environmental Setting: Acidic rock cliffs form on resistant bedrock. Little soil and few nutrients are available to support plants on the acidic cliff faces. Although often cooler and moister than Acidic Rocky Summits because of aspect or shading from surrounding forests, there is a continuum of conditions and Acidic Rock Cliff Communities may be physically below Acidic Rocky Summits and above Acidic Talus Slopes.

Vegetation Description: The vascular vegetation is sparse, the plant association not distinctive. Common polypody (*Polypodium virginianum*) and rusty cliff-fern (*Woodsia ilvensis*) are often present in the crevices. Harebell (*Campanula rotundifolia*), bristly sarsaparilla (*Aralia hispida*), marginal wood-fern (*Dryopteris marginalis*), fringed bindweed (*Polygonum cilinode*), stout goldenrod (*Solidago squarrosa*), and Virginia creeper (*Parthenocissus quinquefolia*) are common on acidic cliffs, as well as in other sterile acidic conditions. Purple-flowering raspberry (*Rubus odoratus*) occurs on acidic cliffs in the northern and western parts of the state. Trees from the surrounding forest may shade the cliff face; shaded cliffs have less vegetation than sunny occurrences. Surrounding forests are variable: oak forest, northern hardwoods, hemlock, or others throughout the state. Lichens may be abundant on the rock face. Cliffs are small areas within surrounding forest, and reflect the vegetation of the surroundings.

Associations:

Habitat Values for Associated Fauna: All types of cliffs provide nesting habitat for Ravens (*Corvus corax*) and, in the past, Peregrine Falcons (*Falco peregrinus*) nested on cliffs before being extirpated from Massachusetts in 1955, and the Peregrine Falcons released in urban areas since 1984 have not returned to the natural habitat, although they are breeding in the state. Cliffs were probably the native habitat of the Eastern Phoebe (*Sayornis phoebe*). No mammals, reptiles, or amphibians would be expected on the steep cliff faces.

Associated Rare Plants:

ADLUMIA FUNGOSA	CLIMBING FUMITORY	T
ASPLENIUM MONTANUM	MOUNTAIN SPLEENWORT	E

Associated Rare Animals:

FALCO PEREGRINUS	PEREGRINE FALCON	E
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Examples with Public Access: Known from the towns of Florida, Sandisfield, New Salem, Leverett, Erving, and Leominster, Mt. Tekoa WMA, Russell; Mt. Everett State Reservation, Mt. Washington.

Threats: Rock climbing can break plants off of the cliff face, remove small pockets of soil, and wear lichens off of the rocks. Distinct trails appear on heavily used cliffs. Development in the vicinity of cliffs, most cliffs themselves are seldom directly threatened by development.

Management Needs:

Inventory Need Rank: 2

Inventory Comments:

Synonyms:

USNVC/TNC: Includes: *Asplenium montanum* sparsely vegetated Alliance – *Asplenium montanum* Sparse Vegetation [CEGL004391]; Includes: Lichen vegetation - *Umbilicaria mammulata* Nonvascular Alliance – *Umbilicaria mammulata* Nonvascular Vegetation [CEGL004387].

MA (old name): SNE ACIDIC CLIFF COMMUNITY.

ME: Acidic Cliff Community.

NH: [Large open talus] 1994- Acidic Cliff Community.

VT: Temperate Acidic Cliff Community.

NY: Part of: Cliff Community.

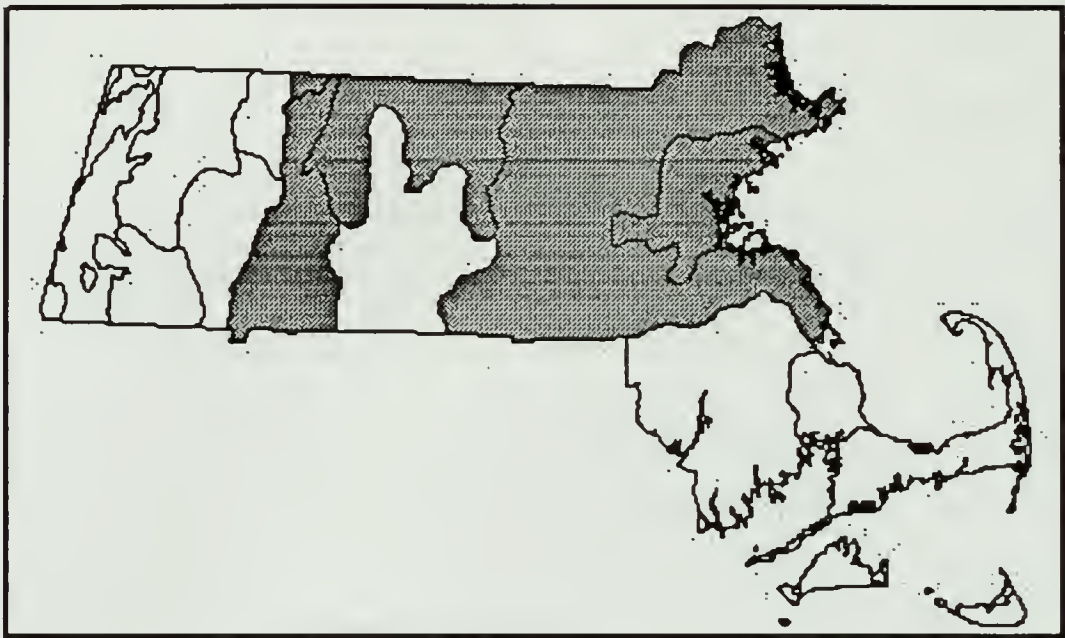
CT:

RI:

Weatherbee: Southern Acidic Cliff Community.

Author: P. Swain **Date:** 3/28/00

Community Name: CIRCUMNEUTRAL ROCK CLIFF COMMUNITY
Community Code: CT2A2B0000
SRANK: S3
Tracked: No



Concept: A community of extremely sparse scattered vascular plants on small ledges and in crevices within a vertical substrate of rocks. Lichens are occasionally dense on the cliff face. Circumneutral Rock Cliff Communities tend to be more diverse than found in Acidic Rock Cliff Communities.

Environmental Setting: Sandstone, traprock, conglomerate or other non-acidic, non-calcareous rock. Dry to moist [variation not well enough known to separate communities]. Often has circumneutral traprock below the cliff, sometimes balds or rock outcrops above. May be shaded by trees of surrounding forest.

Vegetation Description: Species of dry open areas, including pale corydalis (*Corydalis sempervirens*), bearberry (*Arctostaphylos uva-ursi*), plantain-leaved pussytoes (*Antennaria plantaginifolia*), columbine (*Aquilegia canadensis*), marginal wood-fern (*Dryopteris marginalis*), little bluestem grass (*Schizachyrium scoparium*), ebony spleenwort (*Asplenium platyneuron*), Rusty cliff-fern (*Woodsia ilvensis*), and mosses. In the area, chestnut oak (*Quercus prinus*), scrub oak (*Quercus ilicifolia*), red cedar (*Juniperus virginiana*), pasture rose (*Rosa carolina*), and Prickly ash (*Zanthoxylum americanum*).

Associations:

Habitat Values for Associated Fauna: All types of cliffs provide nesting habitat for Ravens (*Corvus corax*) and, in the past, Peregrine Falcons (*Falco peregrinus*) nested on cliffs before being extirpated from Massachusetts in 1955, and the Peregrine Falcons released in urban areas since 1984 have not returned to the natural habitat, although they are breeding in the state. Cliffs were probably the native habitat of the Eastern Phoebe (*Sayornis phoebe*). No mammals, reptiles, or amphibians would be expected on the steep cliff faces.

Associated Rare Plants:

ASPLENIUM RUTA-MURARIA	WALL-RUE SPLEENWORT	T
MINUARTIA MICHAUXII	MICHAUX'S SANDWORT	SC
RANUNCULUS MICRANTHUS	TINY-FLOWERED BUTTERCUP	T
SELAGINELLA RUPESTRIS	ROCK SPIKEMOSS	- WL

Associated Rare Animals:

NONE KNOWN

Examples with Public Access: Rocky Mountain Park, Greenfield; Mt. Tom State Reservation, Easthampton / Holyoke; Mt. Sugarloaf State Reservation, Deerfield.

Threats: Rock climbing can break plants off of the cliff face, remove small pockets of soil, and wear lichens off of the rocks. Distinct trails appear on heavily used cliffs. Development in the vicinity of cliffs, most cliffs themselves are seldom directly threatened by development.

Management Needs:

Inventory Need Rank: 2

Inventory Comments:

Synonyms:

USNVC/TNC: Includes some of: *Asplenium ruta-muraria* - *Pellaea atropurpurea* Sparsely Vegetated Alliance -- *Asplenium ruta-muraria* - *Pellaea atropurpurea* Sparse Vegetation.

MA (old name): SNE CIRCUMNEUTRAL CLIFF COMMUNITY

ME: Circumneutral Cliff Community

NH: 1994 - Circumneutral Cliff community

VT: within Temperate Calcareous Cliff community

NY:

CT:

RI:

Weatherbee:

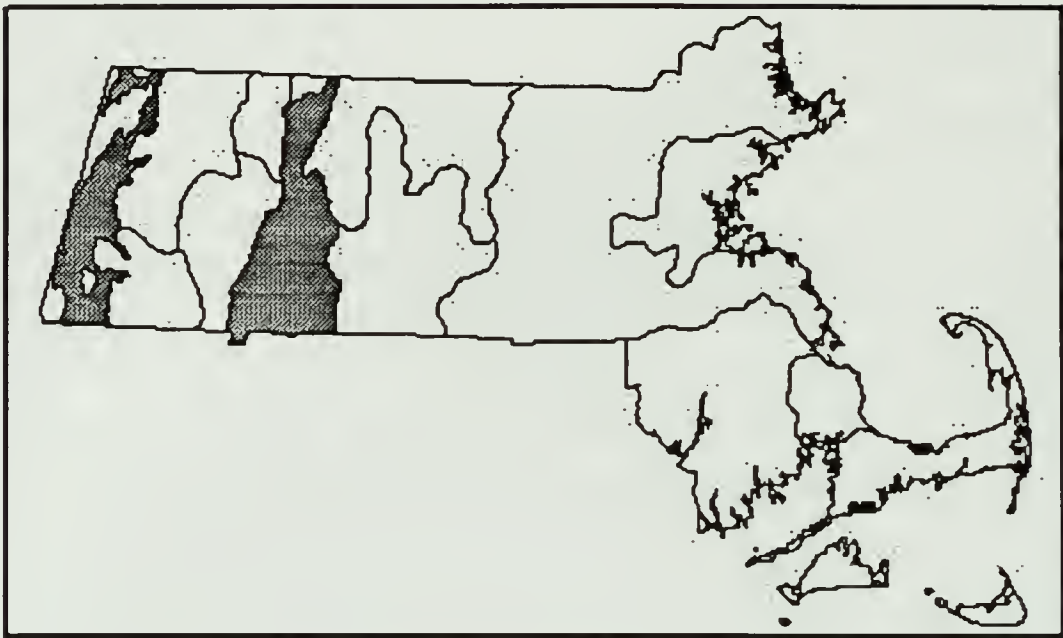
Author: P. Swain **Date:** 7/1/99

Community Name: CALCAREOUS ROCK CLIFF COMMUNITY

Community Code: CT2A2C0000

SRANK: S3

Tracked: No



Concept: Extremely sparse vegetation, in cracks and small ledges of nearly vertical cliff faces. A more diverse community than found on Acidic Cliffs.

Environmental Setting: Vertical, or close to vertical, exposures of resistant limestone, dolomite, or other calcareous bedrock; cliffs often include ledges and have talus slopes below. There is minimal soil development. Surroundings tend to be northern hardwood forest, sometimes rich mesic forests. Calcareous rock outcrop and summit communities may occur above, although much calcareous rock in Massachusetts is overlain by more resistant acidic rock. The moister ledge communities are usually mid-slope dolomite ledges or cliff faces with little soil.

Vegetation Description: The vegetation is distinct and specific to the habitat. Purple cliff brake (*Pellaea atropurpurea*), bulblet fern (*Cystopteris bulbifera*), maidenhair spleenwort (*Asplenium trichomanes*), blunt-lobed cliff-fern (*Woodsia obtusa*), walking fern (*Asplenium rhizophyllum*), and columbine (*Aquilegia canadensis*) are characteristic species of vascular plants. Bearberry (*Arctostaphylos uva-ursi*) and harebell (*Campanula rotundifolia*) grow in drier open sites, and moister, shaded sites have early saxifrage (*Saxifraga virginensis*), rock-pellitory (*Parietaria pensylvanica*), small enchanter's nightshade (*Circaea alpina*), and rock-cresses (*Arabis hirsuta*, *A. lyrata*, and *A. laevigata*). Lichen and moss grow on the rock face and in small cracks. Surrounding forest often includes sugar maple (*Acer saccharum*), white ash (*Fraxinus americana*), basswood (*Tilia americana*), butternut (*Juglans cinerea*), and black and yellow birches (*Betula lenta* and *B. alleghaniensis*).

Associations:

Habitat Values for Associated Fauna: All types of cliffs provide nesting habitat for Ravens (*Corvus corax*) and, in the past, Peregrine Falcons (*Falco peregrinus*) nested on cliffs before being extirpated from Massachusetts in 1955, and the Peregrine Falcons released in urban areas since 1984 have not returned to the natural habitat, although they are breeding in the state. Cliffs were probably the native habitat of the Eastern Phoebe (*Sayornis phoebe*). No mammals, reptiles, or amphibians would be expected on the steep cliff faces.

Associated Rare Plants:

AMELANCHIER SANGUINEA	ROUNDLEAF SHADBUSH	SC
ARABIS LAEVIGATA	SMOOTH ROCK-CRESS	T
ARABIS LYRATA	LYRE-LEAVED ROCK-CRESS	T
ASPENIUM RUTA-MURARIA	WALL-RUE SPLEENWORT	T

ASPLENIUM X EBENOIDES	SCOTT'S SPLEENWORT	- WL
CRYPTOGRAMMA STELLERI	FRAGILE ROCK-BRAKE	T
PARIETARIA PENNSYLVANICA	ROCK PELLITORY	- WL

Associated Rare Animals:

NONE KNOWN

Examples with Public Access: Mt. Toby, Sunderland; Bartholemew's Cobble Reservation (*TTO*), Sheffield;

Threats: Rock climbing can break plants off of the cliff face, remove small pockets of soil, and wear lichens off of the rocks. Distinct trails appear on heavily used cliffs. Development in the vicinity of cliffs, most cliffs themselves are seldom directly threatened by development.

Management Needs:

Inventory Need Rank: 2

Inventory Comments:

Synonyms:

USNVC/TNC: includes: Cystopteris bulbifera Sparsely Vegetated Alliance – Cystopteris bulbifera Sparse Vegetation [Provisional] [CECL004394]; Includes some of: Asplenium ruta-muraria - Pellaea atropurpurea Sparsely Vegetated Alliance – Asplenium ruta-muraria - Pellaea atropurpurea Sparse Vegetation.

MA (old name): SNE CALCAREOUS CLIFF COMMUNITY.

ME:

NH: 1994 - Calcareous Cliff community.

VT: In part: Calcareous Cliff Community.

NY: Calcareous Cliff Community.

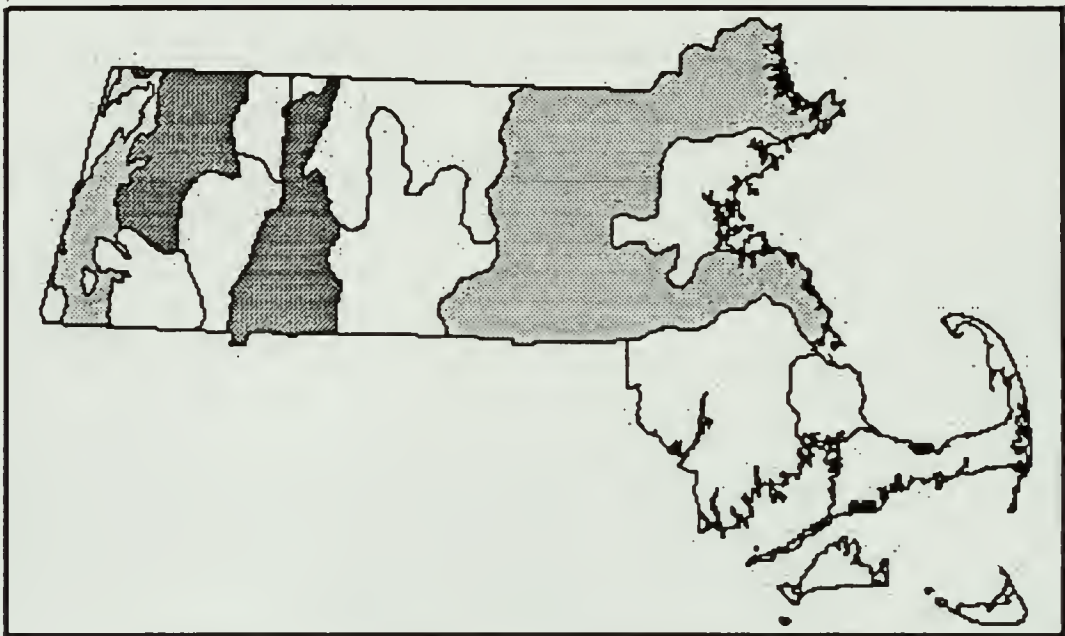
CT:

RI:

Weatherbee: Southern Calcareous Cliff Community.

Author: P. Swain **Date:** 7/1/99

Community Name: RIVERSIDE ROCK OUTCROP COMMUNITY
Community Code: CT2A3A0000
SRANK: S3
Tracked: No



Concept: Sparse, mostly herbaceous, vegetation limited to crevices where soil accumulates: only outcrops influenced by river processes are considered to be riverside outcrops.

Environmental Setting: The community occurs on flood scoured bedrock along rivers. The outcrops may be low or steep on the river's edge or extending into the river channel with alluvial soil accumulated in crevices in the rocks. Although regularly disturbed by almost annual flooding and ice scouring, river spray and proximity to water may alleviate some of the harsh conditions usually encountered on sand in open areas. Related to Riverside Seeps, which are distinguished by being wet most of the year.

Vegetation Description: Riverside rock outcrops support vegetation typical of other outcrops, low and scattered herbaceous plants; but also have fewer woody plants due to annual ice scouring. Typical plants include a mix of usually only a few species per site: included might be harebell (*Campanula rotundifolia*), Canadian burnet (*Sanguisorba canadensis*), big blue stem (*Andropogon gerardii*), prostrate dogbane (*Apocynum cannabinum* var. *hypericifolium*), goldenrods (*Solidago* spp.) or smooth, or riverside, rose (*Rosa blanda*). Nonnative species that commonly occur are Canada bluegrass (*Poa compressa*) and Purple loosestrife (*Lythrum salicaria*).

Associations:

Habitat Values for Associated Fauna: These small, exposed communities have few, if any, animals that are restricted to them. Shoreline foragers such as otter (*Lontra canadensis*), mink (*Mustela vison*), and raccoons (*Procyon lotor*) would use rock outcrops as part of their overall habitat. Turtles are not attracted to rocks, preferring to bask on logs. Occasional bull frogs (*Rana catesbeiana*) or northern water snake (*Nerodia sipedon*) would be expected. Common species of Dragonflies and tiger beetles hunt over the rock areas.

Associated Rare Plants:

AMELANCHIER SANGUINEA	ROUNDLEAF SHADBUSH	SC
ARABIS MISSOURIENSIS	GREEN ROCK-CRESS	T
ASTER TRADESCANTII	TRADESCANT'S ASTER	SC
CAREX LENTICULARIS	SHORE SEDGE	T
DESCHAMPSIA CESPITOSA SSP GLAUCA	TUFTED HAIRGRASS	E
SOLIDAGO PTARMICOIDES	UPLAND WHITE ASTER	T
TRisetum TRIFlorum SSP MOLLE	SPIKED FALSE OATS	E

Associated Rare Animals:

NONE KNOWN

Examples with Public Access: None known on public lands in Massachusetts.

Threats: Trampling by river users and competition from exotic species.

Management Needs: Removal of exotics from best sites.

Inventory Need Rank: 2

Inventory Comments:

Synonyms:

USNVC/TNC:

MA (old name): SNE RIVERSIDE OUTCROP COMMUNITY.

ME: Similar to: Acidic Shoreline Outcrop Community and Circumneutral Shoreline Outcrop Community.

NH: Riverside Outcrop Communities.

VT: Riverside Outcrop Community.

NY: Includes: Shoreline outcrop and Calcareous shoreline outcrop.

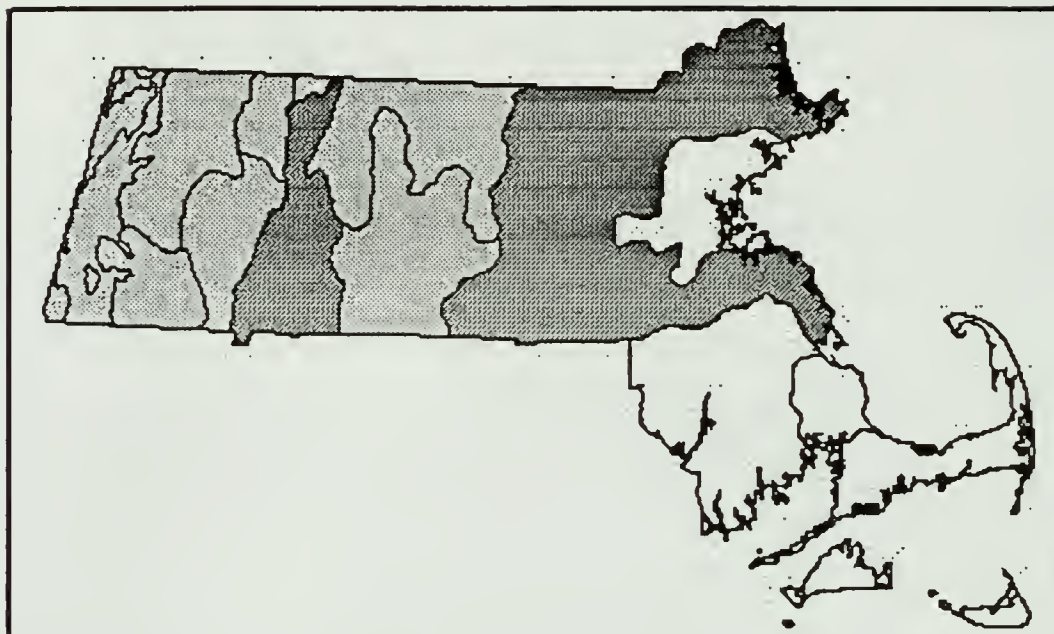
CT:

RI:

Weatherbee: Part of: High-gradient Stream Community.

Author: P. Swain **Date:** 7/1/99

Community Name: DRY RIVERSIDE BLUFF
Community Code: CT2B2B1000
SRANK: S2
Tracked: Yes



Concept: An erosional gravel/sandy cliff face next to rivers or river floodplains supporting species of dry habitats in predominantly open conditions.

Environmental Setting: High, 20-40 feet, bluffs of gravel next to river floodplains. Fire has been important in at least some situations, especially on drier south and southwest facing slopes. In areas of oak - pine forests, bluff tops and surroundings may support black oak savannas or dry to mesic oak - pine forests or woodlands. Wetter areas between slopes support shrub thickets or forests.

Vegetation Description: Scattered individuals or thickets of scrub oak (*Quercus ilicifolia*), American hazelnut (*Corylus americana*), gray birch (*Betula populifolia*), and trembling aspen (*Populus tremuloides*), with little blue stem (*Schizachyrium scoparium*), lowbush blueberries (*Vaccinium angustifolium* and *V. pallidum*), sweet fern (*Comptonia peregrina*), goat's rue (*Tephrosia virginiana*), stiff aster (*Ionactis linariifolius*), woodland sunflower (*Helianthus divaricatus*), and lupine (*Lupinus perennis*) between patches. Bare ground maintained by erosion, amount varies with location and recent disturbances. This community - type may be subdivided into Acidic and Calcareous variants with further inventory.

Associations:

Habitat Values for Associated Fauna: Harsh, dry conditions limit the number of species expected of all types. Bank Swallows (*Riparia riparia*) and Belted Kingfisher (*Ceryle alcyon*) nest in sandy banks, especially of large rivers. Less common Northern Rough-winged Swallows also use sand and clay banks. Turtles nest in sand that collects at the bottom of such bluffs and tiger beetles breed at the bases and hunt in flatter near by areas.

Associated Rare Plants:

LUPINUS PERENNIS WILD LUPINE - WL

Associated Rare Animals:

NONE KNOWN

Examples with Public Access: Clinton River Bluff, Clinton.

Threats: Gravel mining removes the community. The substrate is easily disrupted and eroded, but bank stabilization interferes with the natural changes in the community..

Management Needs:

Inventory Need Rank: 2

Inventory Comments:

Synonyms

USNVC/TNC: Includes: Pinus strobus -Betula populifolia Woodland Alliance -- Pinus strobus - Betula populifolia / Comptonia peregrina/ Schizachyrium scoparium Woodland [CEGL006004]; Small eroding Cliffs/ banks Sparse Vegetation Alliance -- Eroding Cliffs Sparse Vegetation [CEGL002315].

MA (old name): DRY SANDY RIVERBLUFF OPENING.

ME:

NH: Part of: White pine - gray birch / sweet fern / little bluestem woodland.

VT: Erosional River Bluff Community.

NY:

CT:

RI:

Weatherbee:

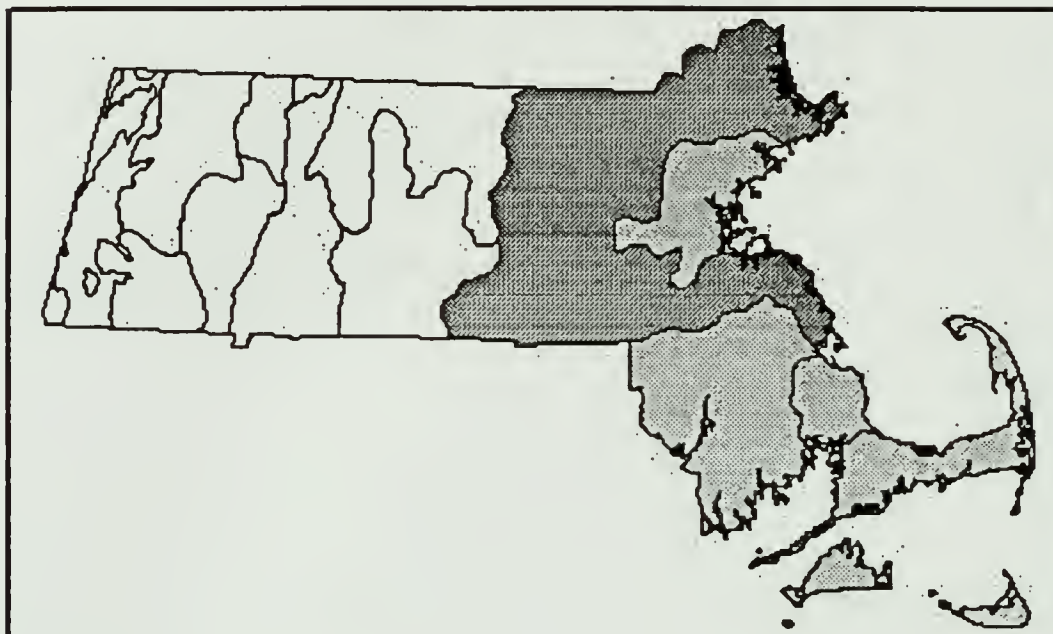
Author: P. Swain **Date:** 8/5/99

Community Name: MARITIME ROCK CLIFF COMMUNITY

Community Code: CT2A4B0000

SRANK: S2

Tracked: No



Concept: Sparsely vegetated rock areas with plants in crack and ledges where soil collects, above tidal zone, but within salt spray.

Environmental Setting: Ocean side of rocky headlands, above rocky intertidal, but within the salt spray zone.

Vegetation Description: Low, scattered plants of salt and wind hardy plants such as knotted pearlwort (*Sagina nodosa* ssp. *nodosa*), saltworts (*Salicornia* spp.), common rush (*Juncus effusus*), seaside plantain (*Plantago maritima*), poison ivy (*Toxicodendron radicans*), and mosses. Species from the top of the headland, usually a Maritime Shrubland Community, occur in less exposed ledges.

Associations:

Habitat Values for Associated Fauna: Harbor seals (*Phoca vitulina*) use the rocks below the cliffs to haul out and rest. The exposed rock face itself does not provide habitat for specialized fauna.

Associated Rare Plants:

SAGINA NODOSA SSP NODOSA	KNOTTED PEARLWORT	T
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Associated Rare Animals:

NONE KNOWN

Examples with Public Access: Pigeon Cove, Rockport; Brier Neck, Gloucester; Egg Rock, Nahant.

Threats:

Management Needs:

Inventory Need Rank: 2

Inventory Comments: Buzzard's Bay shoreline should be checked.

Synonyms:

USNVC/TNC:

MA (old name): Part of SNE Coastal Rocky Headland Community.

ME: Similar to part of: Open headland community.

NH: Part of coastal rocky headland.

VT: . Not applicable.

NY:

CT:

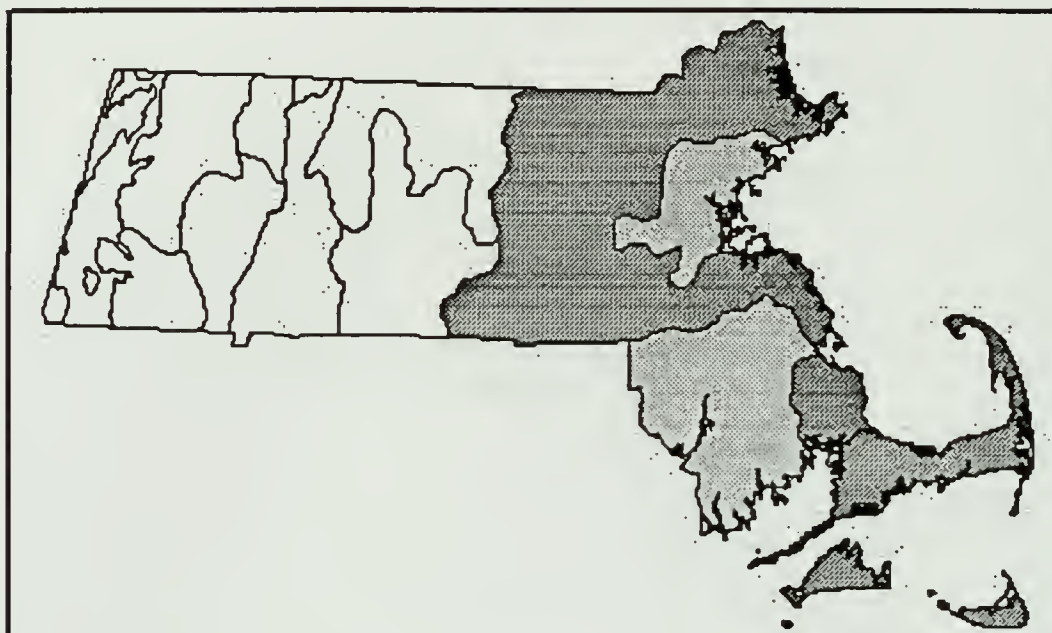
RI:

Weatherbee: Not applicable.

Author: P. Swain

Date: 7/1/99

Community Name: MARITIME EROSIONAL CLIFF COMMUNITY
 Community Code: CT2B1E0000
 SRANK: S2
 Tracked: No



Concept: Extremely sparse vegetation on cliffs being actively eroded by the sea.

Environmental Setting: Seaward unconsolidated cliff faces, subject to erosion, particularly in storms. In the salt spray zone, above beach strand communities. Vegetation is most diverse where freshwater seepage emerges through the bluff. Clay and sand substrates may support different communities, needs inventory.

Vegetation Description: Vegetation typical of surrounding areas, but usually very sparse: Poison ivy (*Toxicodendron radicans*), Virginia creeper (*Parthenocissus quinquefolia*), wild rose (*Rosa carolina* and *R. rugosa*), bayberry (*Myrica pensylvanica*), sweet fern (*Comptonia peregrina*), beach plum (*Prunus maritima*), black cherry (*Prunus serotina*), huckleberry (*Gaylussacia baccata*), bearberry (*Arctostaphylos uva-ursi*), and catbriar (*Smilax rotundifolia*). In areas with freshwater seepage, common horsetail (*Equisetum arvense*) and the non-native Orache (*Atriplex patula*) will often grow.

Associations:

Habitat Values for Associated Fauna: Tiger beetles are characteristic animals of the base of the community. Bank Swallows (*Riparia riparia*) nest in the top parts of the cliffs. Migrating Peregrine Falcons (*Falco peregrinus*) regularly perch on and hunt from the upper part of sea cliffs during the fall migration.

Associated Rare Plants:

PRENANTHES SERPENTARIA	LION'S FOOT	E
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Associated Rare Animals:

CICINDELA LIMBALIS	BANK TIGER BEETLE	SC
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Examples with Public Access: Martha's Vineyard; Nantucket; Cape Cod; NoMan's Island; Penikese Island WS, Gosnold.

Threats: Bank stabilization interferes with natural processes of erosion. But erosion becomes severe with added human induced disturbance, including from foot traffic and climbing.

Management Needs: Continuing to keep pedestrian traffic off cliff faces.

Inventory Need Rank: 2

Inventory Comments: Elizabeth Islands and Buzzards Bay coastline should be checked - preliminary with aials would be useful. Clay and sand substrates may support different communities, needs inventory.

Synonyms:

USNVC/TNC: Not described as such , but might fit within Small eroding cliffs/banks sparse vegetation alliance; also Smilax spp. Toxicodendron radicans vine-Shrubland Alliance – Smilax glauca - Toxicodendron radicans Vine Shrubland [CEGL003886].

MA (old name): Maybe part of Coastal Dunes.

ME: INCLUDES Maritime Shrubland Community.

NH: Related to: 1997 - Maritime Dune Forest/Woodland and 1994 - Coastal Dune Community.

VT: Not applicable.

NY: includes part of: Maritime dunes and Maritime shrubland.

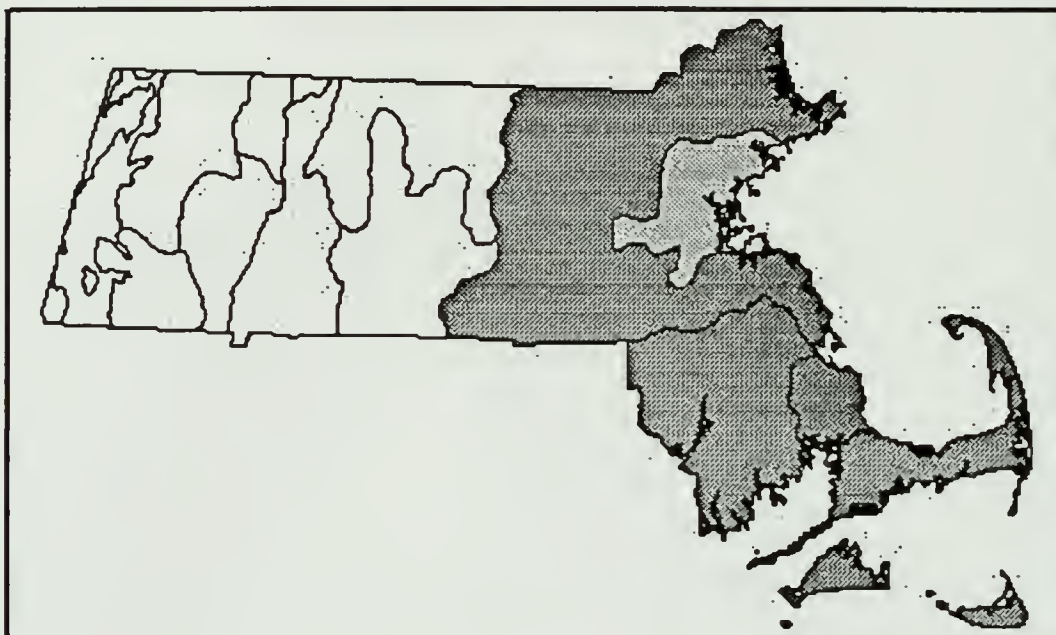
CT: Possibly not present or maybe Terrestrial Scarcely Vegetated Erosional Slope or Terrestrial Scarcely Vegetated Sand Accumulations.

RI: Maritime Cliff.

Weatherbee: Not applicable.

Author: P. Swain **Date:** 1/14/00

Community Name: MARITIME BEACH STRAND COMMUNITY
 Community Code: CT2B1A0000
 SRANK: S3
 Tracked: No



Concept: Sparsely vegetated, long, narrow community between wrack line of high tide and foredunes.

Environmental Setting: Usually part of a barrier beach system, seaward of dunes, but above the daily high tides. Beach strands are subject to overwash during storms and spring tides.

Vegetation Description: Sparsely vegetated community with scattered cover of sea-rocket (*Cakile edentula*) and dune grass (*Ammophila breviligulata*). Beach pea (*Lathyrus japonicus*), seabeach orache (*Atriplex pentandra*), seabeach sandwort (*Honckenia peploides*), seaside-flatsedge (*Cyperus filicinus*), seabeach saltwort (*Salsola kali* ssp. *kali*) and seaside goldenrod (*Solidago sempervirens*) occasionally occur at the foot of the dunes or protected beaches, along with the non-native Russian thistle, (*Salsola kali* spp. *tragus*).

Associations:

Habitat Values for Associated Fauna: Several species of shorebird are beach specialist, nesting and foraging on beach strands, including Least Terns (*Sterna antillarum*), Piping Plover (*Charadrius melodus*), and American Oystercatcher (*Haematopus palliatus*). Beach strands are important shorebird staging areas: migratory shorebirds use barrier beach systems, including the beach strand community, for resting and congregating before and during migration. Merlins (*Falco columbarius*) and Peregrine Falcons (*Falco peregrinus*) forage on beaches during migrations. No amphibians or reptiles regularly occur on beaches. Few mammals use the beaches except for hunting by midsized predators such as red fox (*Vulpes vulpes*), striped skunk (*Mephitis mephitis*), and coyote (*Canis latrans*) and resting by seals (mostly *Phoca vitulina*). Invertebrate specialists include several species of tiger beetles, beach flies, and, on the south side of the Cape, ghost crabs at their northern limit of distribution.

Associated Rare Plants:

LEYMUS MOLLIS SSP MOLLIS	SEA LYME-GRASS	E
MERTENSIA MARITIMA	OYSTERLEAF	E
POLYGONUM GLAUCUM	SEA-BEACH KNOTWEED	- WL

Associated Rare Animals:

CHARADRIUS MELODUS	PIPING PLOVER	T
CICINDELA DORSALIS DORSALIS	NORTHEASTERN BEACH TIGER BEETLE	E
STERNA ANTILLARUM	LEAST TERN	SC

Examples with Public Access: Race Point, Provincetown; Monomoy NWR, Chatham; Coast Guard Beach, CCNS, Eastham; Nauset Beach, Chatham and Orleans; Sandy Neck, Barnstable; Plymouth Beach, Plymouth; Horseneck Beach State Reservation, Westport; Plum Island, Parker River NWR, Newbury.

Threats: Invasive species: seabeach poppy (*Glaucium flavum* = *Argemone glossum*); Recreational use, foot and vehicular traffic.

Management Needs: Allow natural disturbances, deposition and erosion, and exposure to overwash and salt spray. Restrict vehicle traffic.

Inventory Need Rank: 3

Inventory Comments: Well known from shore bird management work.

Synonyms:

USNVC/TNC: Includes: Sand flats- *Cakile edentula* sparsely vegetated Alliance – *Cakile edentula* ssp. *edentula* - *Salsola caroliniana* sparse Vegetation [CEGL004400].

MA (old name): COASTAL BEACH STRAND COMMUNITY.

ME: Beach strand community.

NH: Coastal beach strand community.

VT: Not applicable.

NY: Maritime beach.

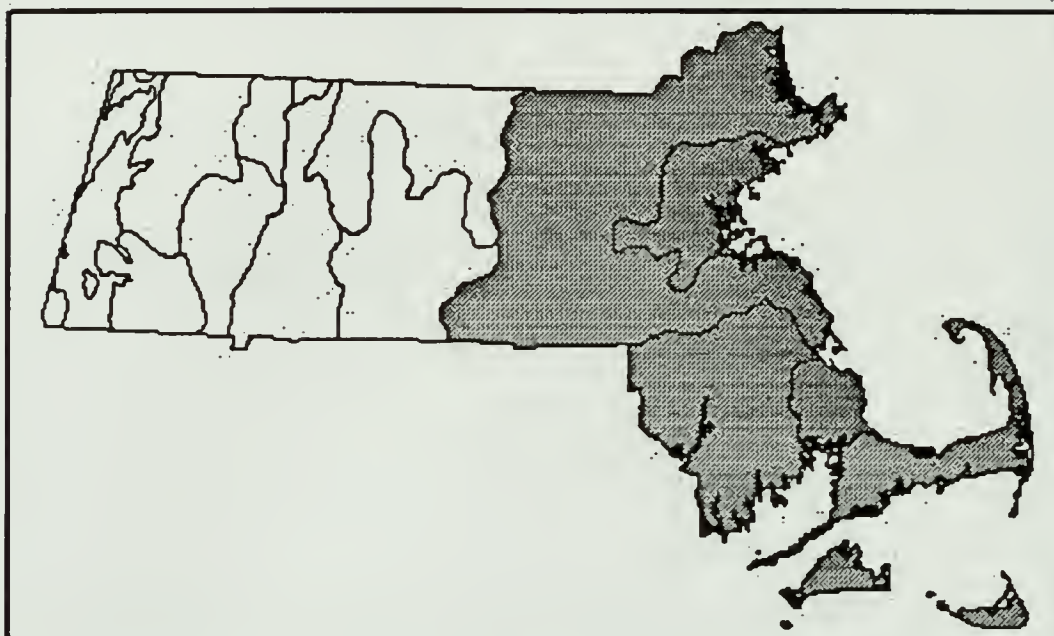
CT: Includes: *Cakile edentula* - *Chenopodium album* Perennial Forb Vegetation.

RI: Maritime beach.

Weatherbee: Not applicable.

Author: P. Swain **Date:** 7/1/99

Community Name: MARITIME DUNE COMMUNITY
 Community Code: CT2B1B0000
 SRANK: S2
 Tracked: Yes



- Concept:** This is the classic community of sand dunes, with patches of herbaceous plants interspersed with areas of bare sand and shrubs.
- Environmental Setting:** The maritime dune community occurs on windswept dunes, within the salt spray zone, often landward of the Beach Strand Community and grading into shrubland or woodlands on the more sheltered back dunes. Dunes are deposited by wind action or storm overwash. Wet areas between dunes are Interdunal Swale Communities. Usually part of a barrier beach system. Ability of dunes to move is an important part of the habitat they provide.
- Vegetation Description:** Sand dunes characterized by expanses of beach grass (*Ammophila breviligulata*) with seaside goldenrod (*Solidago sempervirens*), beach pea (*Lathyrus japonicus*), and beach and golden heathers (*Hudsonia tomentosa* and *H. ericoides*). Shrubs such as bearberry (*Arctostaphylos uva-ursi*), bayberry (*Myrica pensylvanica*), lowbush blueberry (*Vaccinium angustifolium*), sweet fern (*Comptonia peregrina*), and beach plum (*Prunus maritima*) grow on protected slopes and some interdunal areas, mostly sparse, but becoming dominant to form shrublands. Poison ivy (*Toxicodendron radicans*) is often dense. Salt hay (*Spartina patens*), common hairgrass (*Deschampsia flexuosa*), little blue stem (*Schizachyrium scoparium*), and poverty grass (*Danthonia spicata*) are common grasses of the community. Pinweed (*Lechea* spp.), nutrush (*Cyperus* spp.) and sand jointweed (*Polygonella articulata*) grow mixed with *Hudsonia*. Scattered pitch pine (*Pinus rigida*) occur in some dune systems. Actual composition and structure of the vegetation depends upon recent dune stability (deposition and erosion) and distance from the ocean.
- Associations:**
- Habitat Values for Associated Fauna:** A variety of seabirds shorebirds and song birds nest at the base and sides of dunes and in the interdunal area. The particular species depend upon topography, hydrologic regime, and the amount and type of plant cover. Vernal pools occur in some dune systems, serving as important feeding and breeding areas for a variety of reptiles and amphibians, invertebrates, and birds and mammals. Diamondback terrapins (*Malaclemys terrapin*) use dunes for nesting. Northeastern Beach Tiger Beetles overwinter in the dunes.

Associated Rare Plants:

ARISTIDA TUBERCULOSA

SEABEACH NEEDLEGRASS

SC

Associated Rare Animals:

ASIO FLAMMEUS	SHORT-EARED OWL	E
CHARADRIUS MELODUS	PIPING PLOVER	T
CIRCUS CYANEUS	NORTHERN HARRIER	T
MALACLEMYS TERRAPIN	DIAMONDBACK TERRAPIN	T
ONCONEMIS RIPARIA	DUNE NOCTUID MOTH	SC
STERNA HIRUNDO	COMMON TERN	SC

Examples with Public Access: Crane Beach, Ipswich; Plum Island, Parker River NWR; Sandy Neck Barnstable; Scusset Beach, Sandwich; Cape Cod National Seashore - Provinceland Dunes, Coast Guard Beach dunes, Nauset Beach dunes; Monomoy NWR, Chatham; Black Beach, Falmouth; Nantucket; Martha's Vineyard; Horseneck Beach State Reservation, Westport.

Threats: Exotics, (*Lonicera morrowii*, *Lythrum salicaria*, and *Artemisia stelleriana*). Traffic (foot as well as vehicular) breaks the surface structure and removes vegetation. Road cuts change wind patterns and so alter deposition, erosion, and vegetation.

Management Needs: Removal of exotics at best sites. Continue closure of dunes to foot traffic. Limit roads and other cuts through the dunes.

Inventory Need Rank: 3

Inventory Comments: Plover and tern work maintains inventories of the habitats.

Synonyms:

USNVC/TNC: Includes: Sand dunes - -- *Ammophila breviligulata* Herbaceous Alliance - *Ammophila breviligulata* - *Carex silicea* Herbaceous Vegetation [CEGL006274]; and *Hudsonia tomentosa* Dwarf-Shrubland Alliance -- *Hudsonia tomentosa* - *Arctostaphylos uva-ursi* Dwarf - Shrubland [CEGL006143] [also in Coastal heathland community]; [also in Maritime Shrubland] *Toxicodendron radicans* vine- Shrubland Alliance -- *Smilax glauca* - *Toxicodendron radicans* Vine - Shrubland [CEGL003886]; part of [also in Maritime Shrubland] *Myrica pensylvanica* - (*Prunus maritima*) Shrubland Alliance -- *Myrica pensylvanica*- *Rosa rugosa* Shrubland [CEGL006295].

MA (old name): COASTAL DUNE COMMUNITY.

ME: Sand dune community, some of Maritime shrubland community.

NH: Coastal Dune Community and Includes: Beach grass grassland; and part of Inland beach strand community and includes *Hudsonia* sand and gravel barren.

VT: Not applicable.

NY: Maritime dunes and part of Maritime heathland and Maritime beach.

CT: Includes: *Ammophila breviligulata* medium-tall grasslands; *Hudsonia tomentosa* dwarf- Shrubland vegetation [also included in Coastal heathland community].

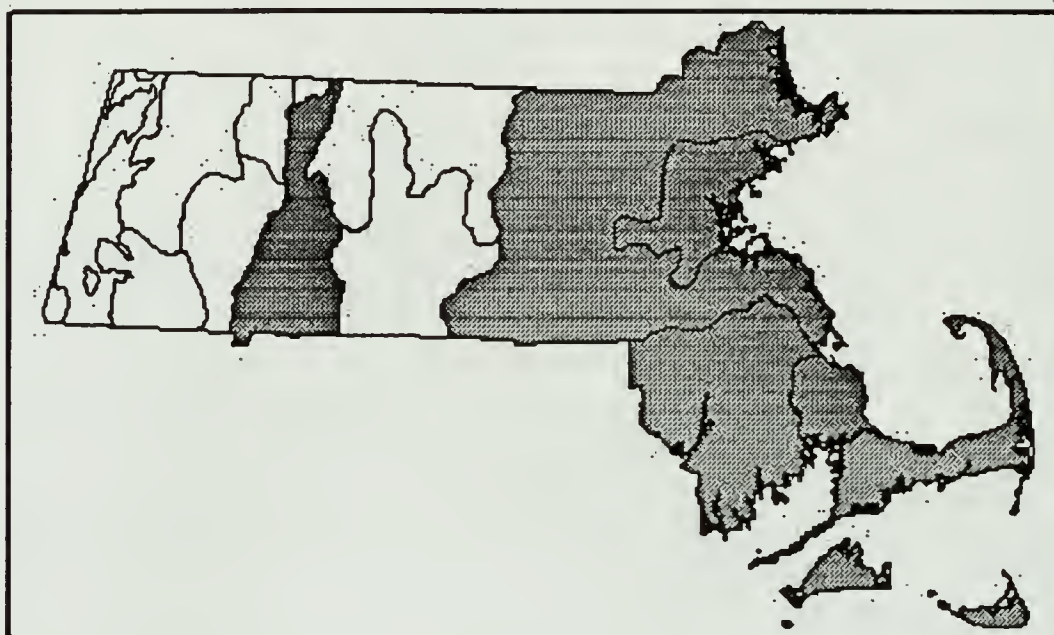
RI: Includes: Maritime dune - a. Beach grass primary dune and b. beach heather- 2ry dune association.

Weatherbee: Not applicable.

Author: J. Lundgren/P. Swain

Date: 7/14/99

Community Name: SANDPLAIN GRASSLAND
 Community Code: CT2B2A0000
 SRANK: S1
 Tracked: Yes



Concept: An open community visually dominated by grasses, although forbs and shrubs are important components of the community.

Environmental Setting: A grassland community on flat outwash plains with droughty, low nutrient soils. Most occurrences are near the ocean and within the influence of winds and salt spray of storms, although sandplains throughout the state support small occurrences of this grassland community. The community grades into sandplain heathlands, shrublands, dunes, or forest. It is maintained by fire, salt spray, and, now, mowing. It often occurs as small openings within Pitch pine / Scrub oak communities.

Vegetation Description: Grasslands are dominated by graminoids, usually little blue stem grass (*Schizachyrium scoparium*), Pennsylvania sedge (*Carex pensylvanica*), and poverty grass (*Danthonia spicata*), with bearberry (*Arctostaphylos uva-ursi*), scrub oak (*Quercus ilicifolia*), stiff aster (*Ionactis linariifolius*, formerly *Aster linariifolius*), bayberry (*Myrica pensylvanica*), lowbush blueberry (*Vaccinium angustifolium*), and black huckleberry (*Gaylussacia baccata*). Shrub clones often form patches. There is great species overlap with sandplain heathlands, but sandplain grasslands are much richer in vascular species. As a group, Goat's rue (*Tephrosia virginiana*), yellow wild indigo (*Baptisia tinctoria*), butterfly weed (*Asclepias tuberosa*), and bird's foot violet (*Viola pedata*) are good indicators of the community.

Associations: Dunwiddie et al. (1996) recognized five grassland associations: Hairgrass Grasslands were divisible into a Beach Grassland subtype and a Heathy Grassland subtype and Little Bluestem Grasslands divided into Pennsylvania Sedge Grasslands, High Diversity Native Sandplain Grasslands, and Weedy Grasslands.

Habitat Values for Associated Fauna: Animal species that are adapted to open areas include birds such as Grasshopper Sparrow (*Ammodramus savannarum*) which is particularly adapted to areas with open ground between grass tussocks and Eastern Meadowlarks (*Sturnella magna*) which uses areas with continuous short grass. Small mammals include meadow vole (*Microtus pennsylvanicus*), meadow jumping mouse (*Zapus hudsonius*), and short-tailed shrew (*Blarina brevicauda*). Grasslands provide hunting territory for hawks and owls. Black racers (*Coluber constrictor*) are common snakes that also live and hunt in open grasslands.

Associated Rare Plants:

AGALINIS ACUTA	SANDPLAIN GERARDIA	E
AMELANCHIER NANTUCKETENSIS	NANTUCKET SHADBUSH	SC
ARISTIDA PURPURASCENS	PURPLE NEEDLEGRASS	T
ASCLEPIAS PURPURASCENS	PURPLE MILKWEED	T
ASCLEPIAS TUBEROSA	BUTTERFLY-WEED	- WL
ASTER CONCOLOR	EASTERN SILVERY ASTER	E
CIRSIIUM HORRIDULUM	YELLOW THISTLE	- WL
DICHANTHELIUM COMMONSIANUM	COMMONS' PANIC-GRASS	SC

GAMOGAETA PURPUREA	PURPLE CUDWEED	E
HELIANTHEMUM DUMOSUM	BUSHY ROCKROSE	SC
LACTUCA HIRSUTA VAR SANGUINEA	HAIRY WILD LETTUCE	- WL
LECHEA MINOR	THYME-LEAF PINWEED	- WL
LIATRIS SCARIOLOA VAR NOVAE-ANGLIAE	NEW ENGLAND BLAZING STAR	SC
LINUM INTERCURSUM	SANDPLAIN FLAX	SC
LUPINUS PERENNIS	WILD LUPINE	- WL
POLYGALA NUTTALLII	NUTTALL'S MILKWORT	- WL
QUERCUS STELLATA	POST OAK	- WL
SCLERIA PAUCIFLORA VAR CAROLINIANA	PAPILLOSE NUT-SEDGE	E
SETARIA GENICULATA	BRISTLY FOXTAIL	SC
SISYRINCHIUM ARENICOLA	SANDPLAIN BLUE-EYED GRASS	SC
SPIRANTHES VERNALIS	GRASS-LEAVED LADIES'-TRESSES	SC

Associated Rare Animals:

AMMODRAMUS SAVANNARUM	GRASSHOPPER SPARROW	T
ASIO FLAMMEUS	SHORT-EARED OWL	E
BARTRAMIA LONGICAUDA	UPLAND SANDPIPER	E
CINGILIA CATENARIA	CHAIN DOT GEOMETER	SC
CIRCUS CYANEUS	NORTHERN HARRIER	T
CYCNA INOPINATUS	UNEXPECTED CYCNA	SC
GRAMMIA OITHONA	OITHONA TIGER MOTH	E
GRAMMIA PHYLLIRA	PHYLLIRA TIGER MOTH	E
METARRANTHIS PILOSARIA	COASTAL SWAMP METARRANTHIS	SC
SEMIOTHRISA EREMIATA	THREE-LINED ANGLE MOTH	SC
SPEYERIA IDALIA	REGAL FRITILLARY	X

Examples with Public Access: Katama Plains, Edgartown; Francis Crane WMA, Falmouth.

Threats: Exotics - Scotch Broom (*Cytisus scoparius*), Japanese knotweed (*Polygonum cuspidatum*), Cypress spurge (*Euphorbia cyparissias*), and cool season grasses such as sheep fescue (*Festuca ovina*), sweet vernal grass (*Anthoxanthum odorata*), velvet-grass (*Holcus lanatus*), and bluegrass (*Poa pratensis*). Mats formed by cool season grasses change the character of the community.

Management Needs: Fire management plans should be produced and implemented to introduce prescribed fire to the best examples. Reduce exotics where possible.

Inventory Need Rank: 3

Inventory Comments:

Synonyms:

USNVC/TNC: Includes: Schizachyrium scoparium - Sorghastrum nutans - Herbaceous Alliance – Schizachyrium scoparium - Sorghastrum nutans - Hypoxis hirsuta - Baptisia tinctoria Herbaceous Vegetation [CEGL006187]; Schizachyrium scoparium ssp. littorale shrub herbaceous Alliance [sparse woody Grassland] – Myrica pensylvanica / Schizachyrium scoparium ssp. littorale - Danthonia spicata Shrub Herbaceous Vegetation [CEGL006067]; Danthonia spicata Herbaceous Alliance [no association defined].

MA (old name): SANDPLAIN GRASSLAND

ME: Sandplain Grassland Community.

NH: Within Pitch pine/ scrub oak barrens community.

VT: Inland examples within Pine- oak- heath sandplain forest.

NY: Includes: Maritime Grassland and Hempstead Grassland (*which receives no salt spray*).

CT: Includes: Schizachyrium scoparium- Danthonia spicata Grasslands - S. scoparium- Hypericum gentianoides- sand.

RI: Maritime Grassland.

Weatherbee: Pitch Pine / Scrub Oak Barren Associated Sandplain Grassland communities.

Author: P. Swain

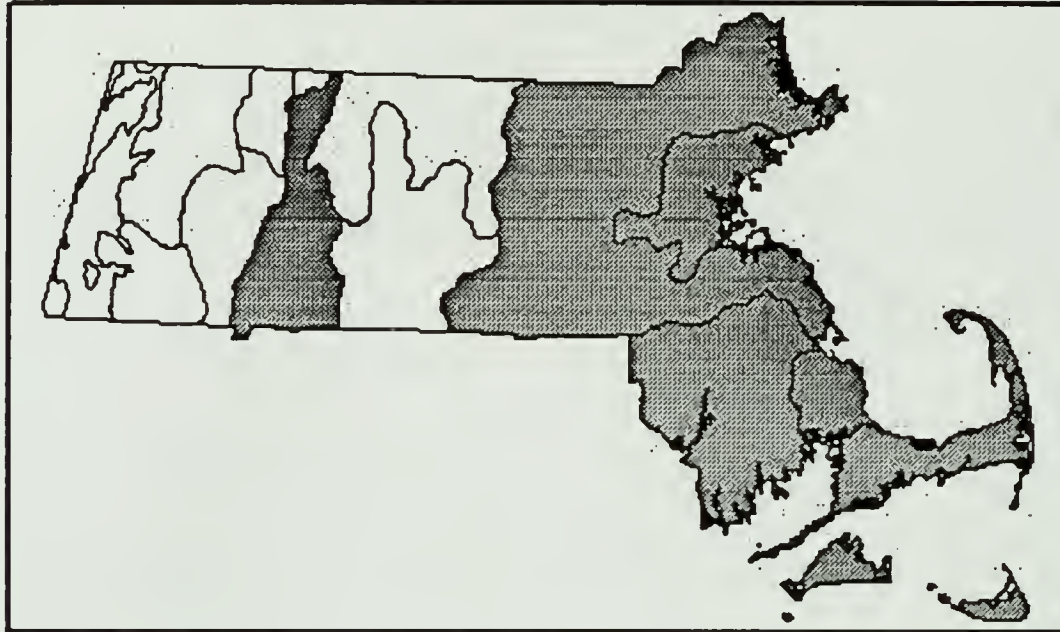
Date: 8/5/99

Community Name: CULTURAL GRASSLAND

Community Code: CT2B2A1000

SRANK: -

Tracked: No



This distribution map focussed on cultural grasslands occurring on sandplains.

- Concept:** A human created and maintained open community dominated by grasses, normally maintained by mowing; primarily of conservation interest for the grassland bird community.
- Environmental Setting:** A grassland community that generally occurs on sand or other droughty, low nutrient soils. Surroundings, in many areas include Pitch pine / Scrub oak communities. Many small airports with surrounding grasslands were built on sand plains. Pastures and hayfields occur in all areas, and surroundings reflect the regional variations.
- Vegetation Description:** Airports, cemeteries, pastures, and hayfields provide different habitats, and support different species of plants and animals. Grasslands at many smaller airports are dominated by graminoids, usually little blue stem grass (*Schizachyrium scoparium*), Pennsylvania sedge (*Carex pensylvanica*), and poverty grass (*Danthonia spicata*), and many non-native species. Some cultural grasslands do have some mix of herbaceous species, such as goldenrods (*Solidago* and *Euthamia* spp.) and milk weeds including butterfly weed (*Asclepias* spp. and *A. tuberosa*).
- Associations:** Grasslands at airports tend to have more native grasses than do fields that are, or were recently, cultivated. Cemeteries are variable, some older ones have more native species than do more actively managed, newer cemeteries. Most cultural grasslands are mowed at least annually to maintain the grassland stage. Hayfields have fewest native species, but do support grassland birds.
- Habitat Values for Associated Fauna:** Distance to the coast and size of the grassland strongly affect the species that use a grassland. Many species of birds that use grasslands are more common in the midwestern prairies and agricultural fields. Airports currently support Massachusetts' largest populations of Upland sandpipers (*Bartramia longicauda*), Grasshopper Sparrows (*Ammodramus savannarum*), and Savannah Sparrow (*Passerculus sandwichensis*). Other grassland birds are found in different habitats - such as Bobolinks (*Dolichonyx oryzivorus*) in hayfield length taller grass, Eastern Meadowlarks (*Sturnella magna*) in pasture length short grass. Other grassland birds include Killdeer (*Charadrius vociferus*), Northern Meadowlarks (*Sturnella magna*), and Horned Larks (*Eremophila alpestris*). Meadow voles (*Microtus pennsylvanicus*), meadow jumping mouse (*Zapus hudsonius*), and the northern short-tailed shrew (*Blarina brevicauda*) would be expected in most grasslands. They would be hunted by garter snakes (*Thamnophis sirtalis*), long-tailed weasels (*Mustela frenata*), Kestrels (*Falco sparverius*), and wintering Northern Harriers (*Circus cyaneus*), Snowy Owls (*Nyctea scandiaca*), and Short-eared Owls (*Asio flammeus*).

Associated Rare Plants:

ASCLEPIAS TUBEROSA	BUTTERFLY-WEED	- WL
LUPINUS PERENNIS	WILD LUPINE	- WL

Associated Rare Animals:

AMMODRAMUS SAVANNARUM	GRASSHOPPER SPARROW	T
BARTRAMIA LONGICAUDA	UPLAND SANDPIPER	E
CYCNIA INOPINATUS	UNEPECTED CYCNIA	SC
CICINDELA PURPUREA	PURPLE TIGER BEETLE	SC
FARONIA RUBIPENNIS	THE PINK STREAK	T
POOECETES GRAMINEUS	VESPER SPARROW	T

Examples with Public Access: Access is limited at airports. Massachusetts Military Reservation, Bourne and Sandwich; Orange Airport, Orange; Turner's Falls Airport, Turner's Falls; Logan Airport, Boston.

Threats: Exotics - especially cool season grasses that form mats. Common non-native species include sheep fescue (*Festuca ovina*), sweet vernal grass (*Anthoxanthum odorata*), velvet-grass (*Holcus lanatus*), bluegrass (*Poa pratensis*), timothy (*Phleum pratense*), and others.

Management Needs: Fire management plans should be produced and followed to introduce prescribed fire to the best examples. Reduce exotics where possible.

Inventory Need Rank: 3

Inventory Comments:

Synonyms:

USNVC/TNC: Related to: Schizachyrium scoparium - Sorghastrum nutans - Herbaceous Alliance – Schizachyrium scoparium - Sorghastrum nutans - Hypoxis hirsuta - Baptisia tinctoria Herbaceous Vegetation [CEGL006187]; Schizachyrium scoparium ssp. littorale shrub herbaceous Alliance [sparse woody Grassland] – Myrica pensylvanica / Schizachyrium scoparium ssp. littorale - Danthonia spicata Shrub Herbaceous Vegetation [CEGL006067]; Danthonia spicata Herbaceous Alliance [possible, no association defined].

MA (old name): SANDPLAIN GRASSLAND - CULTURAL COMMUNITY

ME:

NH:

VT:

NY:

CT:

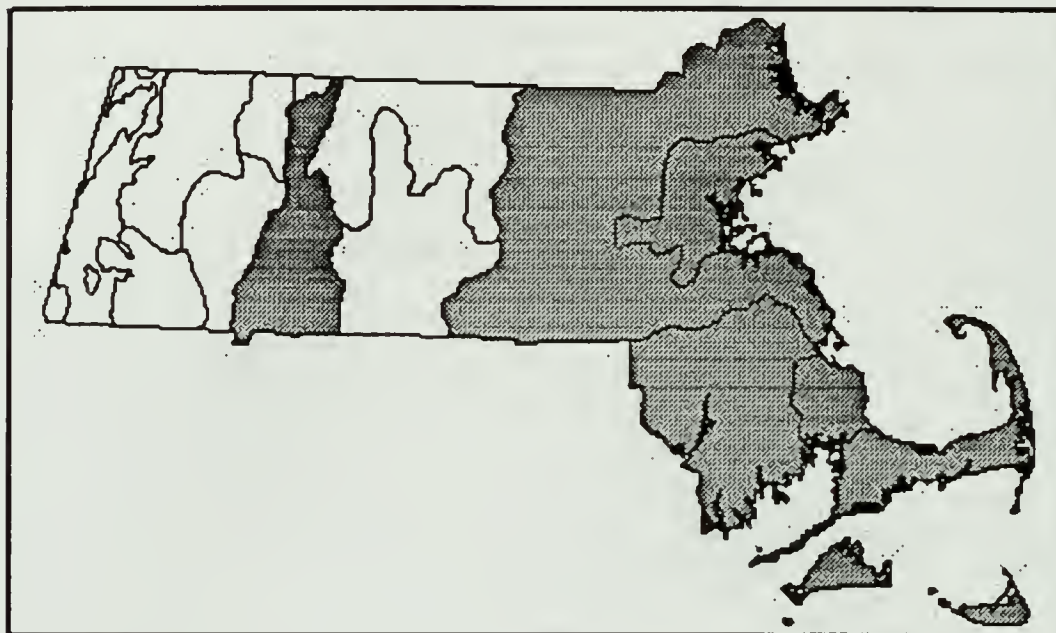
RI:

Weatherbee:

Author: P. Swain

Date: 7/1/99

Community Name: SANDPLAIN HEATHLAND
Community Code: CT2B2B0000
SRANK: S1
Tracked: Yes



- Concept:** An open, shrub dominated, primarily coastal community, sharing many species with Sandplain Grasslands. Heathlands often have sparse clumps of plants with bare soil or lichen cover between the vascular plants.
- Environmental Setting:** Heathlands occur on acidic, nutrient poor, droughty soils. Sandplain heathlands grade into Sandplain Grasslands, and both grade into other coastal communities such as Maritime Shrublands, Scrub Oak Shrublands, and Pitch Pine/Scrub Oak Communities, where they often occur in openings. Natural occurrences were likely maintained by fire and / or salt spray.
- Vegetation Description:** Many of the dominant species in heathlands are woody: scrub oak (*Quercus ilicifolia*), black huckleberry (*Gaylussacia baccata*), bearberry (*Arctostaphylos uva-ursi*), and lowbush blueberry (*Vaccinium angustifolium*). Other characteristic species include hairgrass (*Deschampsia flexuosa*), Pennsylvania sedge (*Carex pensylvanica*), little blue stem (*Schizachyrium scoparium*), stiff aster (*Ionactis linariifolius*, formerly *Aster linariifolius*), bayberry (*Myrica pensylvanica*), golden heather (*Hudsonia ericoides*), chokeberry (*Aronia arbutifolia*), dwarf chinquapin oak (*Q. prinoides*), and sweetfern (*Comptonia peregrina*). Heathlands are less species rich than grasslands and appear taller. The tall shrublands association particularly includes non-ericaceous tall shrubs such as beaked hazelnut (*Corylus cornuta*), beach plum (*Prunus maritima*), and dewberry (*Rubus flagellaris*). The species overlap with grasslands is great: it is the proportion of the species and the resultant structure that separates the communities. The communities are not distinct at some sites.
- Associations:** Dunwiddie et al. 1996 recognized two large heathland associations: Tall shrub, which subdivides into Mixed Maritime Shrubland and Huckleberry - Scrub Oak Heathlands, and Low shrub, which divides into Broom Crowberry Heathlands and Bearberry Heathlands. A somewhat depauperate type of heathland developed on dredge spoils found along the Cape Cod Canal, and could be considered a cultural subtype of heathland community.
- Habitat Values for Associated Fauna:** Horned Lark (*Eremophila alpestris*), Savannah Sparrow (*Ammodramus savannarum*), and Vesper Sparrow (*Pooecetes gramineus*) use sandplain heathlands. Northern harriers (*Circus cyaneus*) nest in heathlands or nearby shrublands and hunt in grasslands and open heathlands. Meadow voles (*Microtus pennsylvanicus*), short-tailed shrews (*Blarina brevicauda*), and white-footed mice (*Peromyscus leucopus*) are often abundant near or under the shrubs. White-footed mice are known to be hosts of the deer tick (*Ixodes scapularis*) that carries Lyme Disease. Other invertebrates of Heathlands includes butterflies such as Hairstreaks and Skippers.

Associated Rare Plants:

AMELANCHIER NANTUCKETENSIS	NANTUCKET SHADBUSH	SC
CIRSIMUM HORRIDULUM	YELLOW THISTLE	- WL
COREMA CONRADII	BROOM CROWBERRY	SC
DICHANTHELIUM COMMONSIANUM	COMMONS'S PANIC-GRASS	SC
HYPERICUM HYPERICOIDES SSP	ST. ANDREW'S CROSS	E
LECHEA MINOR	THYME-LEAF PINWEED	- WL
LIATRIS SCARIOSAE VAR NOVAE-ANGLIAE	NEW ENGLAND BLAZING STAR	SC
LUPINUS PERENNIS	WILD LUPINE	- WL
PRENANTHES SERPENTARIA	LION'S FOOT	E
QUERCUS STELLATA	POST OAK	- WL

Associated Rare Animals:

ABAGROTIS CRUMBI BENJAMINI	COASTAL HEATHLAND CUTWORM	SC
ASIO FLAMMEUS	SHORT-EARED OWL	E
CICINDELA PURPUREA	PURPLE TIGER BEETLE	SC
CINGILIA CATENARIA	CHAIN DOT GEOMETER	SC
CIRCUS CYANEUS	NORTHERN HARRIER	T
HEMILEUCA MAIA	COASTAL BARRENS BUCKMOTH	T
HEMARIS GRACILIS	SLENDER CLEARWING SPHINX MOTH	SC
NICROPHORUS AMERICANUS	AMERICAN BURYING BEETLE	E

Examples with Public Access: Wasque and Long Point - Martha's Vineyard; Middle Moors, Head of the Plains - Nantucket; Marconi - Cape Cod National Seashore, Wellfleet.

Threats: fire suppression, some exotic species such as black pine (*Pinus thunbergiana*) and Scotch Broom (*Cytisus scoparius*). Fragmentation, vehicular traffic, and development. Domestic pets and feral predators are problems for ground nesting bird species, such as Short-eared Owl (*Asio flammeus*).

Management Needs: Fire management plans should be produced and implemented to reintroduce fire, as prescribed fire, to the best examples. Remove exotics where a problem. Control foot and vehicle traffic.

Inventory Need Rank: 2

Inventory Comments: Need North Shore and Bristol County.

Synonyms:

USNVC/TNC: Includes: Hudsonia tomentosa Dwarf-Shrubland Alliance – Hudsonia tomentosa - Arctostaphylos uva-ursi Dwarf - Shrubland [CEGL006143] [also in coastal dune community]; Vaccinium (angustifolium, myrtilloides, pallidum) dwarf -Shrubland Alliance.

MA (old name): SANDPLAIN HEATHLAND.

ME: Included in sandplain grassland community.

NH: Within Pitch pine/ scrub oak barrens community.

VT: Dwarf shrub, if applicable.

NY: Maritime heathland and some of Successional blueberry heath.

CT: Includes: Hudsonia tomentosa dwarf- Shrubland; Arctostaphylos uva-ursi- Vaccinium angustifolia dwarf- Shrublands.

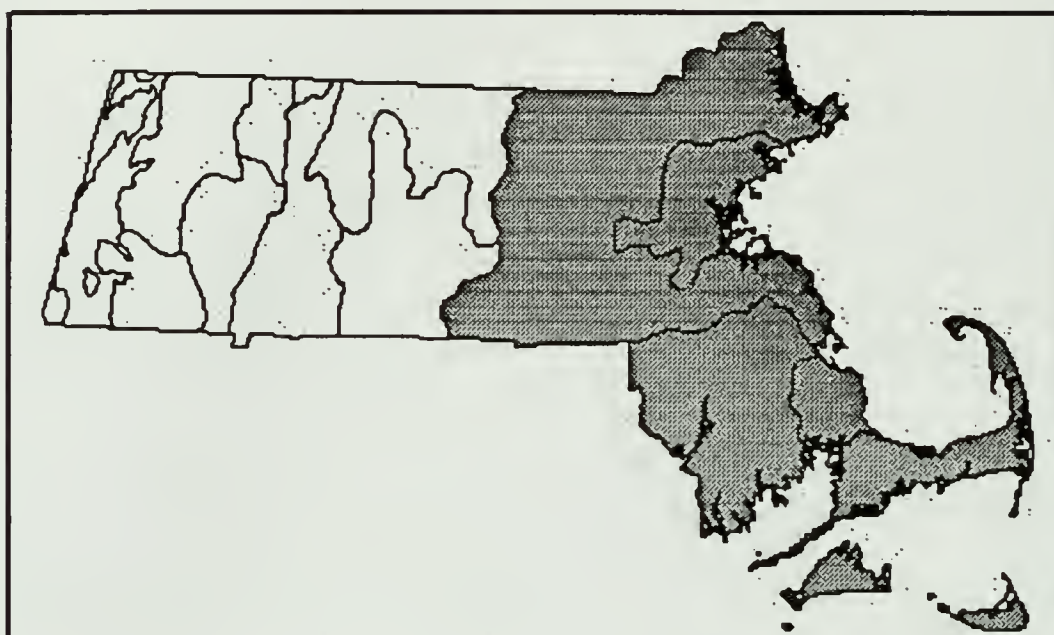
RI: maybe part of Maritime Shrubland or related to Inland Dune/Sand Barren and opening in Pitch Pine / Scrub Oak Barrens.

Weatherbee: Not applicable.

Author: P. Swain

Date: 7/1/99

Community Name: MARITIME SHRUBLAND COMMUNITY
 Community Code: CT2A4A1000
 SRANK: S3
 Tracked: No



Concept: Shrub community, dominated by patches of dense shrubs with scattered more open areas of low growth or bare ground.

Environmental Setting: Coastal, within the area receiving storm salt spray, but out of the normal range of daily salt spray. Occurs on rocky headlands or behind dunes in protected areas of barrier beaches.

Vegetation Description: Often dense patches of shrub, with various species dominating in different areas. Huckleberry (*Gaylussacia baccata*), bayberry (*Myrica pensylvanica*), or red cedar (*Juniperus virginiana*) areas are often distinctive. Black cherry (*Prunus serotina*), beach plum (*Prunus maritima*), chokeberry (*Aronia melanocarpa*), low bush blueberry (*Vaccinium angustifolium*), and bearberry (*Arctostaphylos uva-ursi*) may be abundant. Catbrier (*Smilax rotundifolia*) and poison ivy (*Toxicodendron radicans*) often cover other plants or grow in dense patches on their own.

Associations: Two variants: rocky headlands and on dunes, need to be field checked to see how different they are from each other.

Habitat Values for Associated Fauna: Shrub thickets provide nesting areas for Northern Harriers (*Circus cyaneus*), Northern Towhee (*Pipilo erythrophthalmus*), and Song Sparrows (*Melospiza melodia*). Maritime shrublands are heavily used during fall migrations for cover and forage – many of the plants have fruit attractive to migrants. White-tailed deer (*Odocoileus virginianus*) maintain large populations in shrubland habitats. In such shrub areas, white-footed mice (*Peromyscus leucopus*) are also very abundant, and in the openings meadow voles (*Microtus pennsylvanicus*) are common. Eastern moles (*Scalopus aquaticus*) have an affinity to the sand substrate in the southern part of the state. Long-tailed weasels (*Mustela frenata*) occur in the grass dominated areas where they hunt meadow voles. Eastern hognose snake (*Heterodon platirhinos*) occur in sandy, open areas of shrubland communities areas.

Associated Rare Plants:
 NONE KNOWN

Associated Rare Animals:

CIRCUS CYANEUS	NORTHERN HARRIER	T
METARRANTHIS PILOSARIA	COASTAL SWAMP METARRANTHIS	SC

Examples with Public Access: Halibut Point State Park, Rockport; Nomans Land Island; Sandy Neck, Barnstable;; Plum Island, Parker River NWR, Newbury. In the towns of Nantucket, Aquinnah, and Gosnold.

Threats: Invasive exotics in many occurrences - shrubby honeysuckle (*Lonicera morrowii*) is invasive in many of the locations; barberry (*Berberis thunbergii*), buckthorn (*Rhamnus cathartica*), and Japanese black pine (*Pinus thunbergiana*) are locally dense.

Management Needs: Removal of invasive exotics from otherwise exemplary occurrences.

Inventory Need Rank: 2

Inventory Comments: Buzzard's Bay shores should be checked. Known from Elizabeth Islands, abundance should be rechecked.

Synonyms:

USNVC/TNC: Includes: *Prunus serotina* - *Amelanchier canadensis* - *Quercus* spp. Shrubland Alliance – *Prunus serotina* - *Rhus typhina* / *Cakile edentula* Shrubland [CEGL006399]; *Myrica pensylvanica* - (*Prunus maritima*) Shrubland Alliance – *Myrica pensylvanica*- *Rosa rugosa* Shrubland [CEGL006295]; *Prunus serotina* - *Amelanchier canadensis* - *Quercus* spp. Shrubland Alliance – *Amelanchier canadensis* - *Viburnum* spp. - *Myrica pensylvanica* Shrubland [CEGL006379]; *Toxicodendron radicans* vine- Shrubland Alliance – *Smilax glauca* - *Toxicodendron radicans* Vine - Shrubland [CEGL003886]; *Prunus serotina* - *Amelanchier canadensis* - *Quercus* spp. Shrubland Alliance – *Prunus serotina* - *Sassafras albidum* - *Amelanchier canadensis* / *Smilax rotundifolia* Shrubland [CEGL006145].

MA (old name): SNE COASTAL ROCKY HEADLAND COMMUNITY

ME: Includes Maritime Open Headland Community, and Maritime Shrubland Community, part of Sand Dune Community.

NH: Includes: Maritime Shrubland / barren and Coastal rocky headland; *Prunus serotina* - *Pinus rigida* / *Amelanchier* / *Parthenocissus* - *Toxicodendron* Forest/ Woodland.

VT: Not applicable

NY: Maritime shrubland; includes parts of successional Maritime forest.

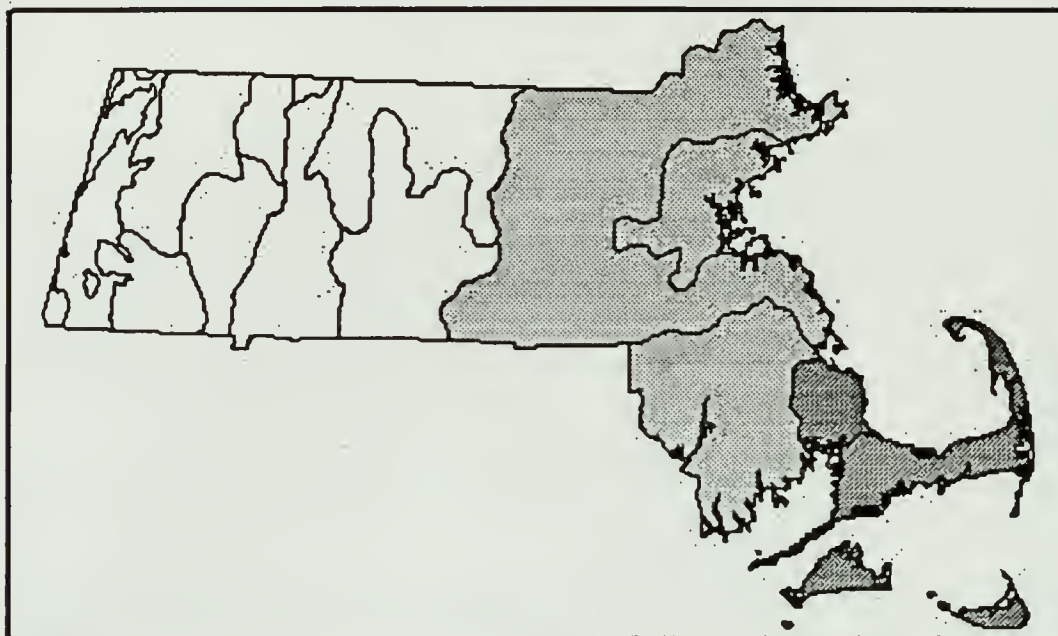
CT: Includes parts of: *Quercus coccinea*- *Sassafras albidum* Woodlands; and *Myrica pensylvanica*- *Prunus maritima* Shrublands.

RI: Includes: Maritime dune - c. dune shrubland; Maritime Shrubland.

Weatherbee: Not applicable

Author: P. Swain **Date:** 7/1/99

Community Name: MARITIME PITCH PINE ON DUNES
Community Code: CT2A1A1200
SRANK: S1
Tracked: Yes



Concept: Scattered pitch pines on active sand dunes, many with trunks at least partially buried. Open canopy with bare ground and scattered shrubs, herbaceous plant, and patches of lichen.

Environmental Setting: The community occurs on moderately stabilized back dunes where storms produce active sand movement. The areas receive salt spray during storms and strong winds, but not on a daily basis.

Vegetation Description: Short, scattered individuals of Pitch pine (*Pinus rigida*) dominates the tree layer. Open sand has scattered beach heather (*Hudsonia tomentosa*), bearberry (*Arctostaphylos uva-ursi*), and patches of lichen.

Associations:

Habitat Values for Associated Fauna: There are no animal species known to be restricted to maritime forests. The open Pitch Pine areas are particularly harsh and exposed, and support fewer animals than more closed communities. Generally, in more salt influenced environments, fewer animals will be expected. As in all communities on peninsulas such as Cape Cod, or on islands, the more remote occurrences have fewer species than those closer to the mainland sources. Moths, butterflies, and other insects of the southeastern oak-pine forest occur in maritime forests.

Associated Rare Plants:

NONE KNOWN

Associated Rare Animals:

NONE KNOWN

Examples with Public Access: Sandy Neck, Barnstable; Provincelands, Provincetown.

Threats:

Management Needs:

Inventory Need Rank: 3

Inventory Comments:

Synonyms:

USNVC/TNC: Pinus rigida Woodland Alliance – Pinus rigida / Hudsonia tomentosa Woodland [CEGL006117] Pinus rigida - Quercus (*coccinea*, *velutina*) Woodland Alliance – Pinus rigida - Quercus velutina / Hudsonia tomentosa Woodland [CEGL006120].

MA (old name): MARITIME FOREST, DUNE SUBTYPE.

ME: Pitch Pine - Dune Semi forest Community.

NH: Included in: 1998 Maritime Dune Forest/Woodland; 1994 - Maritime Forest on Dunes.

VT: Not applicable.

NY: Included in: Pitch pine- oak heath Woodlands.

CT: Included in: Pinus rigida - Quercus stellata Woodland.

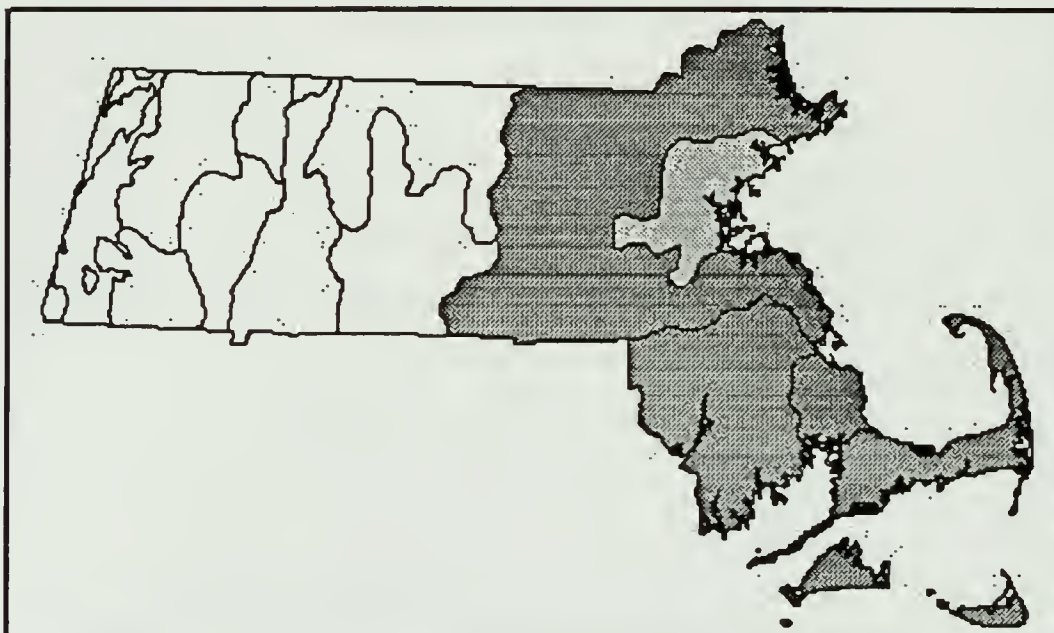
RI: Within the Pitch Pine - Oak Forest and Oak - Pine Forest. And part of Maritime Shrubland.

Weatherbee: Not applicable.

Author: P. Swain

Date: 11/30/99

Community Name: MARITIME JUNIPER WOODLAND / SHRUBLAND
Community Code: CT1A2A1100
SRANK: S1
Tracked: Yes



- Concept:** Predominantly evergreen woodland / shrubland within the coastal salt spray zone. The trees tend to be short (*less than 5 m (about 15 feet)*) and scattered. Tops of trees and shrubs are sculpted by winds and salt spray.
- Environmental Setting:** Maritime communities occur along the coast within the area of direct influence of the ocean and salt spray, but not in areas flooded by salt water. They are usually somewhat protected from direct spray by crests of dunes. Juniper dominated maritime communities tend to occur on sand of interdunal areas, backs of dunes, and exposed bluffs, and also on salt marsh borders, and, to a lesser extent, on rocky headlands.
- Vegetation Description:** Trees are usually short relative to interior forests. The Maritime Juniper Woodland / Shrubland community occurs as part of continua of sparse shrubland to forest, and deciduous to evergreen dominants, in areas of continuous changes of levels of salt spray and substrate types. Virginia juniper, also called red cedar (*Juniperus virginiana*) dominates but occurs in variable, usually low, densities in association with scattered trees and shrubs typical of the surrounding forest such as Pitch pine (*Pinus rigida*), various oaks (*Quercus* spp.), American holly (*Ilex opaca*), black cherry (*Prunus serotina*), red maple (*Acer rubrum*), bayberry (*Myrica pensylvanica*) and winged sumac (*Rhus copallinum*). The herbaceous layer is highly variable, with little blue stem grass (*Schizachyrium scoparium*), beach grass (*Ammophila breviligulata*), and sedges, often with scattered beach heather (*Hudsonia tomentosa*). Microtopography and local conditions strongly influence the species assemblage.
- Associations:**
- Habitat Values for Associated Fauna:** There are no animal species known to be restricted to maritime woodlands. Animal species are those of typical coastal oak areas such as the birds Rufous-sided Towhees (*Pipilo erythrophthalmus*), Gray Catbirds (*Dumetella carolinensis*), Common Yellowthroats (*Geothlypis trichas*), Ovenbird (*Seiurus aurocapillus*) and Black-and-white Warbler (*Mniotilta varia*). Small mammals such as meadow voles (*Microtus pennsylvanicus*), white footed mice (*Peromyscus leucopus*), and gray squirrels (*Sciurus carolinensis*) are common in Massachusetts' forests. Moths, butterflies, and other insects of the southeastern oak and oak-pine forest occur in maritime forests. Generally, in more salt influenced environments, fewer animals will be expected. As in all communities on peninsulas such as Cape Cod, or on islands, the more remote occurrences have fewer species than those closer to the mainland sources.
- Associated Rare Plants:**
NONE KNOWN

Associated Rare Animals:

TERRAPENE CAROLINA

EASTERN BOX TURTLE

SC

**Examples with
Public Access:**

Sandy Neck, Barnstable; Belle Isle Marsh, Revere.

Threats:Exotics, including Asiatic bittersweet (*Celastrus orbiculata*), dune stabilization, roads through the dunes.**Management Needs:**

Exotic control on the best examples.

Inventory Need Rank:

2

Inventory Comments:**Synonyms:****USNVC/TNC:**

Includes: Juniperus virginiana Woodland Alliance – Juniperus virginiana var. virginiana / Myrica pensylvanica Woodland [CEGL006212].

MA (old name):

SNE Maritime Forest on Dunes/Maritime Juniper Forest.

ME:

Includes: part of Sand dune community.

NH:

1998 - Maritime Dune Forest/Woodland.

VT:

Not applicable.

NY:

Includes: Maritime red cedar forest; includes parts of Successional Maritime forest.

CT:

Within the Pinus rigida - Quercus stellata Woodlands.

RI:

Within the Pitch Pine - Oak Forest and Oak - Pine Forest. And part of Maritime Shrubland.

Weatherbee:

Not applicable.

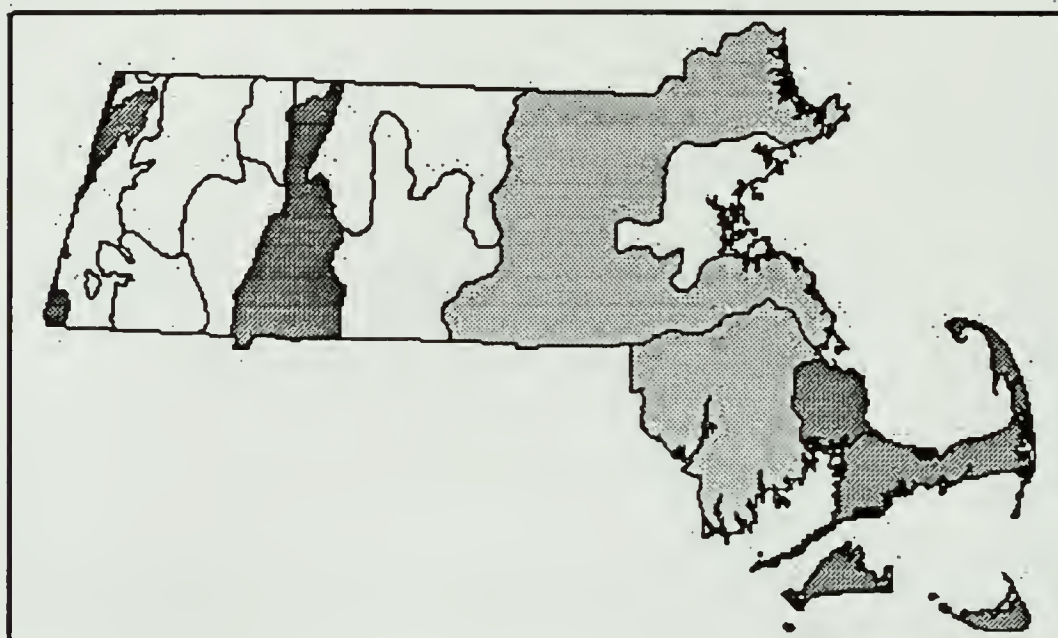
Author:

P. Swain

Date:

1/26/99

Community Name: SCRUB OAK SHRUBLAND
 Community Code: CT2B1F1000
 SRANK: S1
 Tracked: Yes



Concept: A shrubland dominated by scrub oak, with essentially no pitch pine, although within pitch pine - scrub oak areas.

Environmental Setting: Scrub oak shrublands occur within pitch pine / scrub oak communities, particularly in frost bottoms and frost pockets, and on ridge tops near ridge top pitch pine / scrub oak communities. They are part of a mosaic in space and time of grassland and heathland openings, shrublands, pitch pine / scrub oak communities, and oak / pine forest. The shrublands are to some extent maintained by late spring and early fall frosts damaging more susceptible competing tree species.

Vegetation Description: Scrub oak (*Quercus ilicifolia*) and dwarf chinquapin oak (*Q. prinoides*) dominated shrublands, with a variety of other heathland plants, including a significant component of graminoid cover and interspersed with patches of lichen. Characteristic plants besides scrub oak are huckleberry (*Gaylussacia baccata*), low bush blueberry (*Vaccinium angustifolium*), Pennsylvania sedge (*Carex pensylvanica*), little bluestem grass (*Schizachyrium scoparium*), and lichens (*Cladina* and *Cladonia* spp).

Associations:

Habitat Values for Associated Fauna: Refugia for rare, as well as more common, lepidopteran species dependent on oaks. [Proposed for listing 2000, *Ptichodis bistrigata*, Southern *Ptichodis*, T.]

Associated Rare Plants:

COREMA CONRADII	BROOM CROWBERRY	SC
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Associated Rare Animals:

ABAGROTIS CRUMBI BENJAMINI	COASTAL HEATHLAND CUTWORM	SC
ACRONICTA ALBARUFA	BARRENS DAGGERMOTH	T
ANISOTA STIGMA	SPINY OAKWORM	SC
APHARETRA PURPUREA	BLUEBERRY SALLOW	SC
CATOCALA HERODIAS GERHARDI	GERHARD'S UNDERWING MOTHS	T
CICINNUS MELSHEIMERI	MELSHEIMER'S SACK BEARER	T
CINGILIA CATENARIA	CHAIN DOT GEOMETER	SC

HEMILEUCA MAIA	COASTAL BARRENS BUCKMOTH	T
ITAME SP 1	PINE BARRENS ITAME	SC
LYCIA YPSILON	PINE BARRENS LYCIA	T
METARRANTHIS APICIARIA	BARRENS METARRANTHIS MOTH	E
ZALE SP 1	PINE BARRENS ZALE	SC
ZANCLOGNATHA MARTHA	PINE BARRENS ZANCLOGNATHA	T
SEMIOTHISA EREMIATA	THREE-LINED ANGLE MOTH	SC

Examples with Public Access: Manuel F. Correllus SF, Martha's Vineyard; Long Point Reservation [TTOR], Martha's Vineyard; Middle Moors, Nantucket; Myles Standish SF, Plymouth; AND on ridgetops Mt Everett State Reservation, Mt. Washington.

Threats: Development and fragmentation of the entire systems.

Management Needs: Experiments are needed to ascertain the fire dependence/sensitivity of the community and its dependent species.

Inventory Need Rank: 2

Inventory Comments:

Synonyms:

USNVC/TNC: Quercus ilicifolia Shrubland Alliance – Quercus ilicifolia Shrubland [CEGL003883].

MA (old name): SCRUB OAK SHRUBLAND.

ME:NH:VT:NY: Within Pitch pine/ scrub oak barrens.

CT: Quercus ilicifolia Shrubland.

RI: Within Pitch pine/ scrub oak barrens.

Weatherbee:

Author: P. Swain

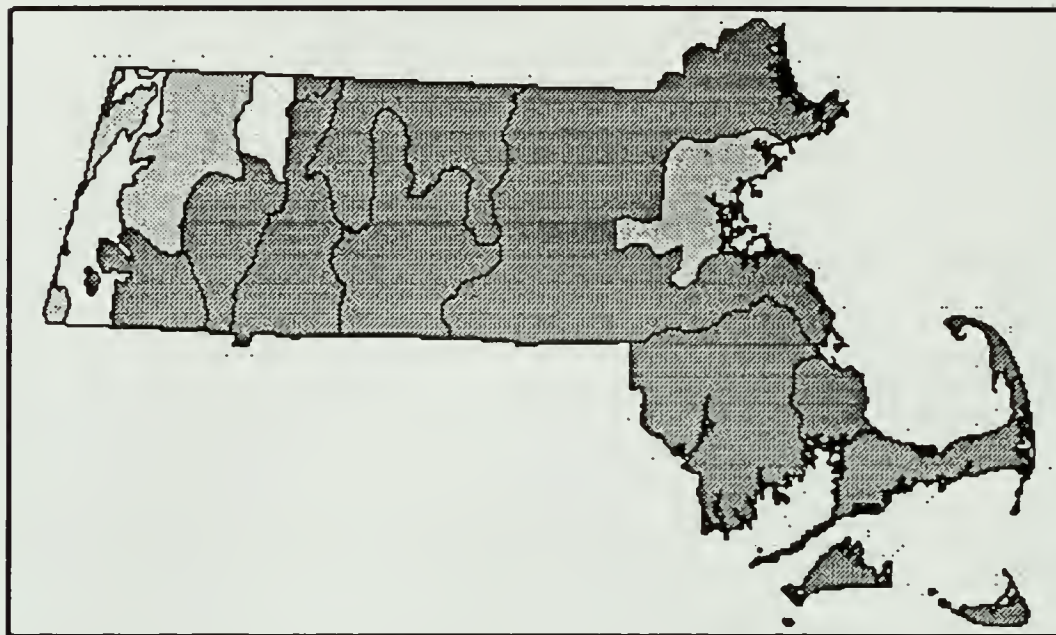
Date: 8/5/99

Community Name: PITCH PINE - SCRUB OAK COMMUNITY

Community Code: CT2B1F0000

SRANK: S2

Tracked: Yes



- Concept:** Shrub dominated communities with scattered to dense trees and scattered openings. Shrubs are often very dense.
- Environmental Setting:** Pitch pine/scrub oak communities develop on droughty, low nutrient soils - usually deep, coarse, well-drained sands derived from glacial outwash - in the coastal plain, the Connecticut River Valley, and other scattered areas throughout the northeast. Pitch pine/ scrub oak communities are a fire maintained and fire dependent community; most species in the community recover well from fire. The openings grade into heathland and grassland communities, which are larger. The community grades into Pitch pine - oak - heath forests which have tree oak species and much less scrub oak, and usually occur in less dry environments.
- Vegetation Description:** Pitch pines form an open canopy above a shrub layer dominated by shrub oaks, scrub oak (*Quercus ilicifolia*) and sometimes dwarf chinquapin oak (*Q. prinoides*). Older oaks may form a nearly impenetrable understory 3-4 m (10-15 feet) tall, or it may be more open and shorter. Huckleberries (*Gaylussacia baccata*) occur between the oak clones or under more open plants. Scattered openings of variable size support patches of heathland or grassland vegetation - more or less sparse lowbush blueberry (*Vaccinium angustifolium*), bearberry (*Arctostaphylos uva-ursi*), lichen patches, little bluestem grass (*Schizachyrium scoparium*), sedges (primarily *Carex pensylvanica* and *C. rugosperma*), and beach heather (*Hudsonia tomentosa*). Cow wheat (*Melampyrum lineare*) and mayflower (*Epigaea repens*) are typically found on edges within the community.
- Associations:** Inland variants on sand of the Pitch Pine/ Scrub Oak Community tend to have more gray birch (*Betula populifolia*), trembling aspen (*Populus tremuloides*) and black cherry (*Prunus serotina*) and pin (or fire) cherry (*Prunus pensylvanica*). A related community, Ridgetop Pitch Pine / scrub oak community occurs on bed rock ridge tops across the state. Maritime Pitch Pine on Dunes has little scrub oak and is much sparser. Pitch pine over sedges with scattered heath species usually develops on previously plowed soils.
- Habitat Values for Associated Fauna:** A large number of species of lepidopterans are restricted to the pitch pine/ scrub oak community, and its openings. The bird fauna is generally that of oak woodlands: Rufous -sided Towhee (*Pipilo erythrophthalmus*), Pine Warbler (*Dendroica pinus*), and ruffed grouse (*Bonasa umbellus*) are common. Whip-poor-will (*Caprimulgus vociferus*) and Common Nighthawk (*Chordeiles minor*) are now increasingly restricted to sandy openings of pitch pine / scrub oak communities. American woodcock (*Philohela minor*) also use the openings.

Associated Rare Plants:

COREMA CONRADII	BROOM CROWBERRY	SC
LUPINUS PERENNIS	WILD LUPINE	- WL

Associated Rare Animals:

ABAGROTIS CRUMBI BENJAMINI	COASTAL HEATHLAND CUTWORM	SC
ACRONICTA ALBARUFA	BARRENS DAGGERMOTH	T
ANISOTA STIGMA	SPINY OAKWORM	SC
APHARETRA PURPUREA	BLUEBERRY SALLOW	SC
CATOCALA HERODIAS GERHARDI	GERHARD'S UNDERWING MOTHS	T
CICINNUS MELSHEIMERI	MELSHEIMER'S SACK BEARER	T
CINGILIA CATENARIA	CHAIN DOT GEOMETER	SC
EACLES IMPERIALIS	IMPERIAL MOTHS	SC
HEMILEUCA MAIA	COASTAL BARRENS BUCKMOTH	T
ITAME SP 1	PINE BARRENS ITAME	SC
LYCIA YPSILON	PINE BARRENS LYCIA	T
METARRANTHIS APICIARIA	BARRENS METARRANTHIS MOTHS	E
ZALE SP 1	PINE BARRENS ZALE	SC
ZANCLOGNATHA MARTHA	PINE BARRENS ZANCLOGNATHA	T

Examples with Public Access: Southern Myles Standish SF (and Camps Cachalot and Squanto areas), Plymouth; Mashpee Pine Barrens, Mashpee; Manuel F. Correllus State Forest, Martha's Vineyard; Montague WMA, Montague.

Threats: Development, fragmentation, and erosion from heavy trail use. Fire suppression and severe wildfires.

Management Needs: Reintroduction of fire according to fire management plans. Many areas that have not burned for more than 20 years may need to have fuels mechanically reduced (*brush cut*) before prescribed fires are attempted.

Inventory Need Rank: 3

Inventory Comments:**Synonyms:**

USNVC/TNC: Includes: Pinus rigida Woodlands Alliance – Pinus rigida / Quercus ilicifolia/ Lespedeza capitata Woodlands [CEGL006025] and Pinus rigida Woodlands Alliance – Pinus rigida / Quercus ilicifolia/ Myrica pensylvanica Woodlands [CEGL006315]; Pinus rigida Woodlands Alliance – Pinus rigida/ Vaccinium spp. - Gaylussacia baccata Woodlands [CEGL005046].

MA (old name): NEW ENGLAND PITCH PINE/SCRUB OAK BARRENS.

ME: Pitch pine- scrub oak barren Community and includes Pitch pine- heath barren Community.

NH: Pitch pine scrub oak barrens Community.

VT: within Pine- oak- heath sandplain forest.

Y: Pitch pine/ scrub oak barrens and Pitch pine- heath barrens.

CT: Pinus rigida Woodlands – Pinus rigida/ Q. ilicifolia comm.; and Pinus rigida Woodlands – Pinus rigida/ Vaccinium angustifolium.

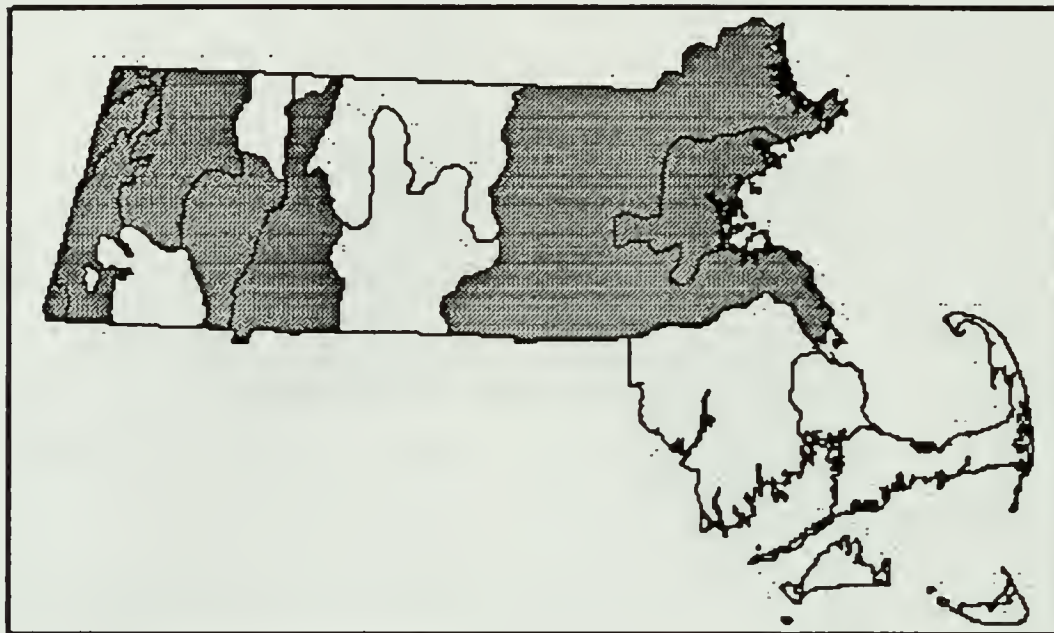
RI: Pitch pine/ scrub oak barrens.

Weatherbee: Pitch pine/ scrub oak barren and associated Grassland community.

Author: P. Swain

Date: 7/1/99

Community Name: RIDGETOP PITCH PINE - SCRUB OAK
 Community Code: CT2A1A1000
 SRANK: S2
 Tracked: No



- Concept:** Ridgetop pitch pine-scrub oak woodland occurring on acidic bedrock, often occurring in a mosaic with Acidic Rocky Summit / Rock outcrop Communities.
- Environmental Setting:** This community, tolerant of extremely xeric growing conditions, is found on ridge tops and exposed outcrops of acidic bedrock (including schists, gneiss, granite and quartzite), ranging in elevation (in Western Massachusetts) from 255 to 792 meters. Aspect may range from N to S along ridgetops, but in general the most typical examples have a south to southwest aspect, and are found on level crests as well as steep slopes and receive high solar insolation. Soil accumulation is slow and soil depths are generally shallow, often with considerable exposed bedrock. Communities are fire dependent—where fire has been infrequent, succession to white pine-oak forest is evident.
- Vegetation Description:** Ridgetops and steep upper mountain slopes with an open to closed canopy of pitch pine (*Pinus rigida*). Soils are thin, in places consisting only of a thin layer (2 cm) of duff and decomposed leaves over bedrock, ranging to several centimeters of sandy, rocky very well drained soil. The woodland canopy characteristically contains somewhat dwarfed pitch pines (avg. 5 m tall), with scattered taller trees including red oak (*Quercus rubra*), black oak (*Q. velutina*), rock chestnut oak (*Q. montana*) and scarlet oak (*Q. coccinea*). Gray birch (*Betula tremuloides*), and hickories (*Carya* spp.) are occasionally present in the canopy or subcanopy. Rarely, one may find red pine (*Pinus resinosa*). White pine (*Pinus strobus*) may dominate the canopy in areas that have not experienced regular fire disturbance. The understory is patchy, and often interspersed with large areas of exposed bedrock. Shrubs commonly include blueberry (*Vaccinium angustifolium* and/or *V. pallidum*), scrub oak (*Quercus ilicifolia*), and huckleberry (*Gaylussacia baccata*). Chinquapin oak (*Quercus prinoides*) is occasionally present. Herbs are sparse and may include Canada mayflower (*Maianthemum canadense*), bastard toad-flax (*Comandra umbellata*), cow wheat (*Melampyrum lineare*), tall corydalis (*Corydalis sempervirens*), black chokeberry (*Aronia melanocarpa*), goldenrod (*Solidago* spp.), and at higher elevations, mountain white potentilla (*Potentilla tridentata*), and bearberry, (*Arctostaphylos uva-ursi*). Variants: A related pitch pine ridgetop community, usually lacking scrub oak, has an herbaceous layer dominated by hairgrass (*Deschampsia flexuosa*) or poverty oats (*Danthonia spicata*). Another variation of acidic rocky ridgetop includes a shrub community dominated by scrub oak, with a similar complement of heaths and herbs, but lacking pitch pine. Pitch pine-scrub oak ridgetop communities may occur in patches with grassy balds, Acidic Rocky Summit / Rock Outcrop Communities, lacking pitch pine and scrub oak. These small balds usually have a more diverse herb layer.

Associations:

Habitat Values for Associated Fauna: No animal species are known to be restricted to this community. Communities of this type likely provide part of the habitat of wide ranging mammals, perches for birds of prey, and food and shelter for flocking song birds prior to the fall migration.

Associated Rare Plants:

SOLIDAGO GLUTINOSA SSP RANDII	RAND'S GOLDENROD	E
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Associated Rare Animals:

APHARETRA PURPUREA	BLUEBERRY SALLOW	SC
CATOCALA HERODIAS GERHARDI	GERHARD'S UNDERWING MOTH	T

Examples with Public Access: Mt. Everett, Race Mt., Alander Mt., Mt. Washington; Pine Cobble Mt., Williamstown; Monument Mt., Stockbridge; Blue Hills, Milton; Mt. Tekoa and Mt. Shatterack.

Threats: Forest succession, fire suppression, trampling, litter.

Management Needs: Prescribed fire to keep fuel loads down, limit succession, and allow regeneration of pitch pine and heaths. As open summits provide great views, trails and education are needed to minimize human impacts such as trampling and littering.

Inventory Need Rank: 3

Inventory Comments: TNC with Conte grant did inventory.

Synonyms:

USNVC/TNC: Pinus rigida Woodland Alliance – Pinus rigida / Quercus ilicifolia / Aronia melanocarpa Woodland [CEGL006323] –and, in part, Pinus rigida / Aronia melanocarpa Woodland [CEGL006116].

MA (old name): Part of: New England Pitch pine/ scrub oak Barrens.

ME: Not described.

NH: Included in Appalachian oak-pine rocky ridge woodland/barren.

VT: Included in Pitch pine - Oak- heath Rocky summit.

NY: related to Dwarf pine ridges and Pitch pine - oak - heath Rock Summit.

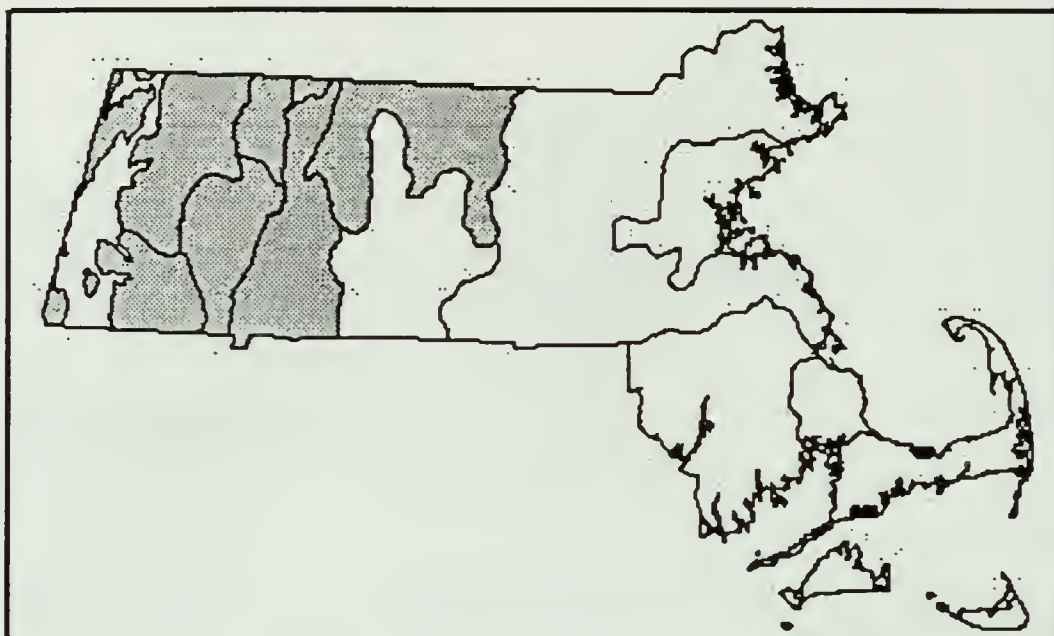
CT: Includes: Schizachyrium scoparium- Danthonia spicata Grasslands - S. scoparium/ Hypericum gentianoides - ridgetop; Pinus rigida/Quercus ilicifolia community.

RI:

Weatherbee: Included in: Southern Acidic Rocky Summit.

Author: Sally Shaw **Date:** 7/19/99

Community Name: **ACIDIC TALUS FOREST / WOODLAND**
 Community Code: CT1B1A1000
 SRANK: S4
 Tracked: No



- Concept:** Open to closed canopy on boulder strewn slopes with scattered and clumped trees, tall shrubs, and a lower layer dominated by vines and ferns. There is often a gradient of vegetation, with exposed rocks at the base of the cliff above the talus slope, and gradually more trees to the base of the slope. Small slopes may have closed canopy coverage from surrounding trees.
- Environmental Setting:** Talus derived from acidic bedrock. Ground cover is exposed talus, moss or lichen covered boulders, and deciduous litter. Community develops on dry to mesic, loose rocky slopes often below cliffs or rock outcrops. Forest grades into surrounding forests which are usually taller and more diverse. Open talus areas are drier, and rocks covered by lichens.
- Vegetation Description:** The canopy is formed by a mix of species including red oak (*Quercus rubra*), sugar maple (*Acer saccharum*), black birch (*Betula lenta*), yellow birch (*B. alleghaniensis*), paper birch (*B. papyrifera*), gray birch (*B. populifolia*), red maple (*Acer rubrum*), beech (*Fagus grandifolia*), hemlock (*Tsuga canadensis*), and white pine (*Pinus strobus*). Scattered shrubs include currants (*Ribes* spp.), large-flowering raspberry (*Rubus odoratus*), mountain and striped maples (*Acer spicatum* and *A. pensylvanicum*), and maple-leaved viburnum (*Viburnum acerifolium*). Marginal wood fern (*Dryopteris marginalis*), rock polypody (*Polypodium virginianum*), bracken fern (*Pteridium aquilinum*), Pennsylvania sedge (*Carex pensylvanica*), corydalis (*Corydalis sempervirens*), silverrod (*Solidago bicolor*), and Virginia creeper (*Parthenocissus quinquefolia*), and poison ivy (*Toxicodendron radicans*), and others make up the herbaceous and vine flora. In exposed talus slopes lichen often covers the exposed rocks.
- Associations:**
- Habitat Values for Associated Fauna:** Most animals are not sensitive to the pH of the substrate, but respond to the size of boulders, cover, moisture, and surroundings of the talus slope. Porcupines (*Erethizon dorsatum*) den in large boulder fields and turkey vultures (*Cathartes aura*) make nests in other large boulder field, but snakes, for example, black racers (*Coluber constrictor constrictor*) and black rat snake (*Elaphe obsoleta*) have hibernating dens in talus with smaller stones. Song birds of talus slopes tend to be those of the surrounding forests.

Associated Rare Plants:

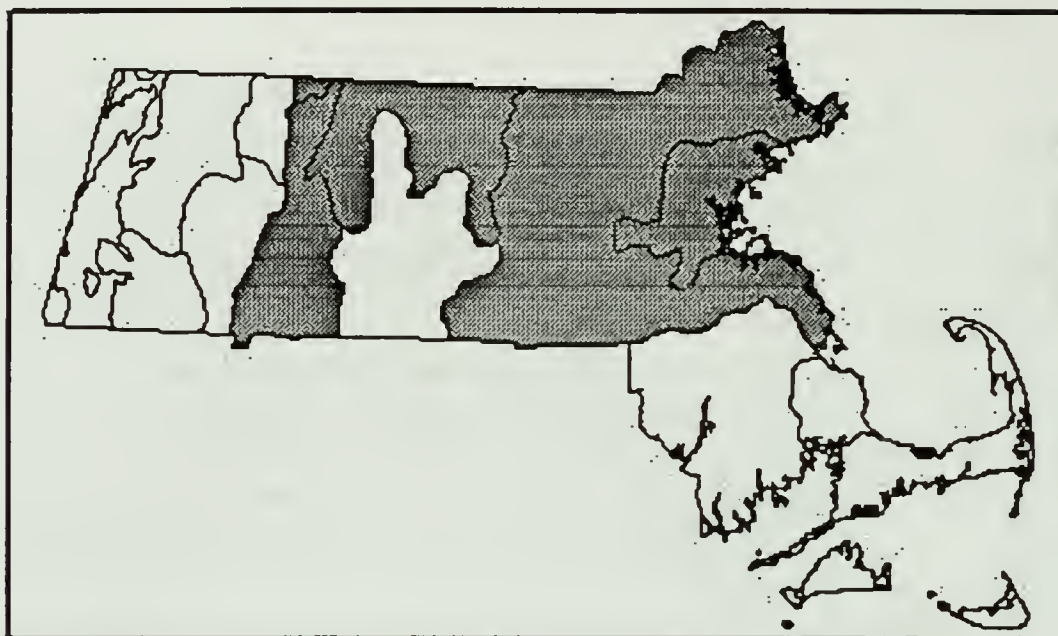
CLEMATIS OCCIDENTALIS	PURPLE CLEMATIS	SC
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Associated Rare Animals:

ELAPHE OBSOLETA	BLACK RAT SNAKE	E
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Examples with Public Access: Mt. Tekoa WMA, Russell; East Mountain, Holyoke.
Threats:
Management Needs:
Inventory Need Rank: 2
Inventory Comments:
Synonyms:
USNVC/TNC: Includes: *Picea rubens* Woodland Alliance – *Picea rubens*/ *Ribes glandulosum* Woodland [CEGL006250]; and *Quercus rubra*- *Q. prinus* Woodland Alliance – *Quercus rubra* / *Polypodium virginianum* Woodland [CEGL006320].
MA (old name): SNE ACIDIC TALUS FOREST/WOODLAND
ME: Acidic talus Community
NH: Includes: Red oak- black birch/ marginal woodfern talus forest/ woodlands; Acidic talus Spruce- birch/ mountain maple talus forest/ Woodland; Low elevation spruce/ rock polypody/ moss cold- air talus Variant; Red oak- pine/ heath Rocky ridge woodland.
VT: Includes: Transition Hardwoods talus Woodlands; Northern/ high elevation talus woodland.
NY: Part of : Acidic talus slope Woodlands and shale talus slope woodland. Ice cave talus community has similarities.
CT: Includes parts of: *Quercus rubra*/ *Cornus florida* forests – *Quercus rubra*/ *Viburnum acerifolium* Community.
RI: Not described
Weatherbee: Not separated, included within surrounding forest such as Dry Acidic Oak/Conifer Forest Community.
Author: P. Swain **Date:** 7/1/99

Community Name: CIRCUMNEUTRAL TALUS FOREST / WOODLAND
 Community Code: CT1B1A2000
 SRANK: S3
 Tracked: No



Concept: Open to closed canopy on boulder strewn slopes with scattered and clumped trees, tall shrubs, and a lower layer dominated by vines and ferns. There is often a gradient of vegetation, with exposed rocks at the base of the cliff above the talus slope, and gradually more trees to the base of the slope. Small slopes may have canopy coverage from surrounding trees.

Environmental Setting: Community develops on dry to mesic, not very acidic talus slopes of basalt or traprock, often below cliffs or rock outcrops. Forest grades into surrounding forests which are usually taller and more diverse. Open talus areas are drier, and rocks are often covered by lichens.

Vegetation Description: A mixture of deciduous forest species contribute to the canopy cover, including sugar and red maples (*Acer saccharum* and *A. rubrum*), black and paper birch (*Betula lenta* and *B. papyrifera*), white ash (*Fraxinus americana*), hickory (*Carya glabra/ovalis*), red oak (*Quercus rubra*), and subcanopy species hop hornbeam (*Ostrya virginiana*) and striped maple (*Acer pensylvanicum*). Shrubs include round-leaved dogwood (also called talus dogwood) (*Cornus rugosa*), hazelnut (*Corylus* spp.), witch-hazel (*Hamamelis virginiana*), maple-leaved viburnum (*Viburnum acerifolium*), and bush honeysuckle (*Diervilla lonicera*). Virginia creeper (*Parthenocissus quinquefolia*), poison ivy (*Toxicodendron radicans*), and occasionally clematis (*Clematis* spp.) and climbing fumitory (*Adlumia fungosa*) climb over the rocks and other plants. Marginal wood-fern (*Dryopteris marginalis*), common polypody (*Polypodium virginianum*), and the debatably exotic herb robert (*Geranium robertianum*) are major components of the sparse herbaceous layer, which includes scattered grasses and sedges.

Associations:

Habitat Values for Associated Fauna: Most animals are not sensitive to the pH of the substrate, but respond to the size of boulders, cover, moisture, and surroundings of the talus slope. Porcupines (*Erethizon dorsatum*) den in large boulder fields and turkey vultures (*Cathartes aura*) make nests in other large boulder field, but snakes such as Black rat snake (*Elaphe obsoleta*) have hibernating dens in talus with smaller stones.

Associated Rare Plants:

ADLUMIA FUNGOSA	CLIMBING FUMITORY	T
CLEMATIS OCCIDENTALIS	PURPLE CLEMATIS	SC
LESPEDeza VIOLACEA	VIOLET BUSH-CLOVER	- WL
SPHENOPHOLIS NITIDA	SHINING WEDGEGRASS	T

Associated Rare Animals:

ELAPHE OBSOLETA

BLACK RAT SNAKE

E

Examples with Public Access: Prospect Hill Park, Waltham; Horn Pond Mountain, Woburn; Mt. Tom State Reservation, Northampton; Rocky Mt. Park, Greenfield.

Threats:**Management Needs:****Inventory Need Rank:** 2**Inventory Comments****Synonyms:**

USNVC/TNC: Includes: Tilia americana - Fraxinus americana Woodland Alliance -- Tilia americana - Fraxinus americana - (Acer saccharum) / Geranium robertianum Woodland [CEGL005058] and Tilia americana - Fraxinus americana - Acer spicatum / Cystopteris fragilis Woodland [CEGL006204].

MA (old name): SNE CIRCUMNEUTRAL TALUS FOREST/WOODLAND.

ME: Circumneutral Talus Community.

NH: part of: Rich Appalachian oak-hickory talus forest/ Woodlands; Rich red oak- sugar maple/ ironwood talus Forest/ Woodlands -- Mesic enriched sugar maple talus variant and Dry rich red oak- ironwood talus variant Red oak- black birch/ marginal woodfern talus Forest/ Woodlands.

VT: Included in: Northern Hardwoods talus woodland.

NY: Includes: Shale talus slope woodland, and part of Acidic talus slope woodland.

CT: Includes: Campanula rotundifolia - Lechea tenuifolia Scarcely Vegetated Talus.

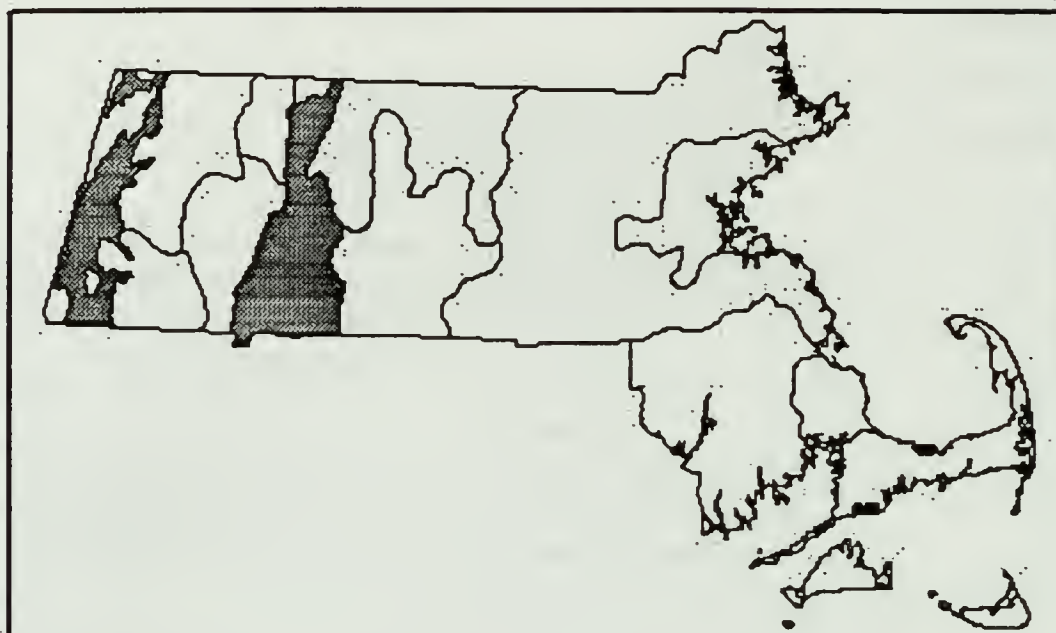
RI: Not described.

Weatherbee: Within Mesic Northern Hardwood forest community.

Author: P. Swain

Date: 7/1/99

Community Name: CALCAREOUS TALUS FOREST / WOODLAND
 Community Code: CT1B1A3000
 SRANK: S3
 Tracked: No



Concept: Open to closed canopy on boulder strewn slopes with scattered and clumped trees, tall shrubs, and a lower layer dominated by vines and ferns. There is often a gradient of vegetation, with exposed calcareous rocks at the base of the cliff above the talus slope, and gradually more trees to the base of the slope. Small slopes may have canopy coverage from surrounding trees.

Environmental Setting: In rich woods, loose talus composed of calcareous boulders such as limestone or dolomite, often below a cliff or rock face. Soil between the boulders is usually moist and loamy.

Vegetation Description: Sugar maple (*Acer saccharum*) is usually the dominant species. Shrubs, abundant if the canopy is open, include round-leaved dogwood, also called talus dogwood (*Cornus rugosa*), downy arrowwood (*Viburnum rafinesquianum*), and purple-flowering raspberries (*Rubus odoratus*). The herbaceous layer includes meadow rue (*Thalictrum* spp.), jack-in-the-pulpit (*Arisaema triphyllum*), white avens (*Geum canadense*), Bottlebrush-grass (*Elymus hystrix* = *Hystrix patula*), broad-leaved woodland sedge (*Carex platyphylla*), and walking-fern (*Asplenium rhizophyllum* = *Camptosorus rhizophyllum*).

Associations:

Habitat Values for Associated Fauna: Most animals are not sensitive to the pH of the substrate, but respond to the size of boulders, cover, moisture, and surroundings of the talus slope. Porcupines (*Erethizon dorsatum*) den in large boulder fields and turkey vultures (*Cathartes aura*) make nests in other large boulder field, but snakes such as Black rat snake (*Elaphe obsoleta*) have hibernating dens in talus with smaller stones.

Associated Rare Plants:

ADLUMIA FUNGOSA	CLIMBING FUMITORY	T
CLEMATIS OCCIDENTALIS	PURPLE CLEMATIS	SC
DIPLAZIUM PYCNOCARPON	GLADE FERN	- WL
DRYOPTERIS GOLDIANA	GOLDIE'S FERN	- WL
VIBURNUM RAFINESQUIANUM	DOWNY ARROWWOOD	T

Associated Rare Animals:

Examples with None identified on public lands.

Public Access:

Threats:

Management Needs: Control of exotics on exemplary sites.

Inventory Need Rank: 2

Inventory Comments:

Synonyms:

USNVC/TNC: Includes: *Acer saccharum*- *Quercus muehlenbergii* Forest Alliance – *Acer saccharum*- *Quercus muehlenbergii* / *Clematis occidentalis* Forest [CEGL006162]; *Acer saccharum*- *Quercus muehlenbergii* Forest Alliance – *Acer saccharum*- *Quercus muehlenbergii* Forest [Provisional] [CEGL005010]; *Acer saccharum* - *Fraxinus americana* - *Tilia americana* Forest Alliance – *Acer saccharum* - *Fraxinus americana* - *Juglans cinerea* / *Staphylea trifolia* Forest [CEGL006020].

MA (old name): SNE CALCAREOUS TALUS FOREST/WOODLAND.

ME: Not described.

NH: Related to: Transitional / Appalachian Circumneutral Talus Woodland Community.

VT: Included in: Northern Hardwoods talus woodland, and Transition Hardwoods Talus Woodland.

NY: Includes: Calcareous talus slope woodland.

CT: Included in: *Acer saccharum* - *Quercus muehlenbergii* Community.

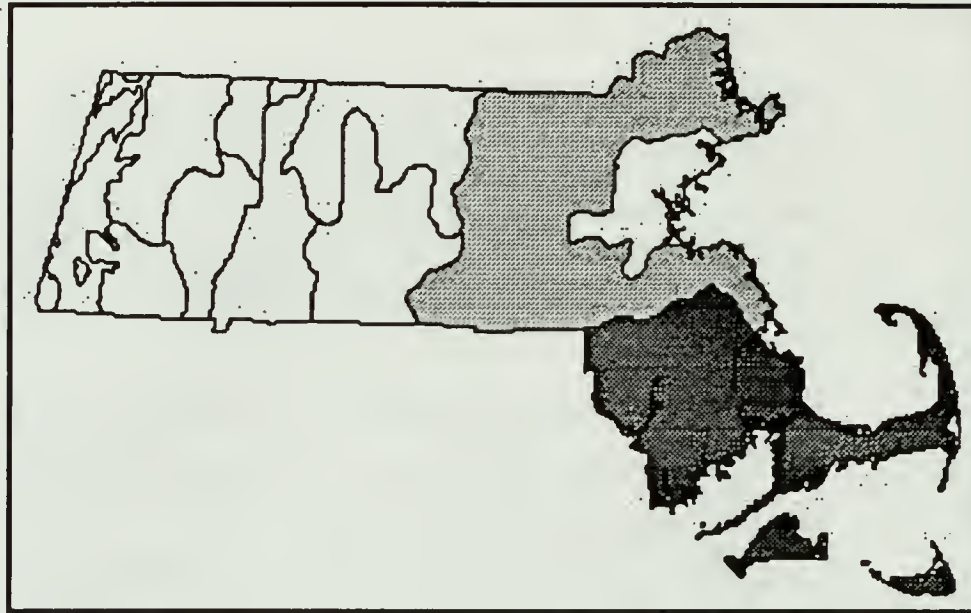
RI: Not described.

Weatherbee: Included in: Dry calcareous oak/conifer forest.

Author: P. Swain

Date: 7/1/99

Community Name: MARITIME OAK - HOLLY FOREST / WOODLAND
Community Code: CT1A2A1000
SRANK: S1
Tracked: Yes



- Concept:** Mixed deciduous/evergreen forest/woodland within the coastal salt spray zone. The trees tend to be short, less than 10 m [about 30 feet].
- Environmental Setting:** Maritime forests occur along the coast within the area of direct influence of the ocean and salt spray, but not in areas flooded by salt water. They occur on exposed bluffs, backs of dunes, interdunal areas, salt marsh borders, and rocky headlands. Tree tops are sculpted by winds and salt spray. They are best developed where somewhat protected from direct spray by crests of dunes.
- Vegetation Description:** Trees are usually short relative to interior forests. Scarlet oak (*Quercus coccinea*), black oak (*Q. velutina*), other oaks, American holly (*Ilex opaca*), sassafras (*Sassafras albidum*), black gum (*Nyssa sylvatica*), black cherry (*Prunus serotina*), and red maple (*Acer rubrum*) are commonly present. Pitch pine (*Pinus rigida*) and red cedar (*Juniperus virginiana*) occur in variable amounts. Vines may be dense especially on the edges of openings; dominants include Greenbrier (*Smilax rotundifolia*) and poison ivy (*Toxicodendron radicans*), Virginia creeper (*Parthenocissus quinquefolia*) and/or grape (*Vitis aestivalis*). Shrubs include bayberry (*Myrica pensylvanica*), winged sumac (*Rhus copallinum*) and sweet pepper-bush (*Clethra alnifolia*). The herbaceous layer is highly variable, and may include grasses and sedges. Microtopography and local conditions strongly influence the species assemblage. Low (but not as wet as swales) interdunal areas often include species of wetlands such as azaleas (*Rhododendron* spp.), viburnums (*Viburnum* spp.), winterberry (*Ilex verticillata*), and high bush blueberry (*Vaccinium corymbosum*). The herbaceous layer of these wetter areas sometimes includes species usually associated with rich, moist sites, such as columbine (*Aquilegia canadensis*), starry Solomon's seal (*Maianthemum stellatum*), and skunk meadow-rue (*Thalictrum revolutum*).
- Associations:**
- Habitat Values for Associated Fauna:** There are no animal species known to be restricted to maritime forests. Animal species are those of typical coastal oak areas such as the birds Rufous-sided Towhees (*Pipilo erythrophthalmus*), Gray Catbirds (*Dumetella carolinensis*), Common Yellowthroats (*Geothlypis trichas*), Ovenbird (*Seiurus aurocapillus*) and Black-and-white Warbler (*Mniotilta varia*). Small mammals such as meadow voles (*Microtus pennsylvanicus*), white footed mice (*Peromyscus leucopus*), and gray squirrels (*Sciurus carolinensis*) are common in Massachusetts' forests. Moths, butterflies, and other insects of the southeastern oak and oak-pine forest occur in maritime forests. Generally, in more salt influenced environments, fewer animals will be expected. As in all communities on peninsulas such as Cape Cod, or on islands, the more remote occurrences have fewer species than those closer to the mainland sources.

Associated Rare Plants:

TILIA NEGLECTA

COASTAL BASSWOOD

- WL

Associated Rare Animals:

LITHOPHANE VIRIDIPALLENS

PALE GREEN PINION MOTH

SC

Examples with Public Access:

Sandy Neck, Barnstable; Horseneck Beach SP, Dartmouth.

Threats:

Exotics, such as Morrow's honeysuckle (*Lonicera morrowii*), dune stabilization, and roads through the dunes.

Management Needs:

Exotic control on the best examples.

Inventory Need Rank:

2

Inventory Comments:

Synonyms:

USNVC/TNC:

Includes: *Quercus alba* - *Quercus* (*falcata*, *stellata*) Forest Alliance – *Quercus stellata* - *Q. velutina* / *Myrica pensylvanica* / *Deschampsia flexuosa* Forest [CEGL006373]; *Fagus grandifolia* - *Quercus alba* Forest Alliance – *Fagus grandifolia* / *Smilax rotundifolia* Forest [CEGL006043]; Part of: *Quercus alba* - (*Quercus velutina*) Woodland Alliance – *Quercus velutina* - *Quercus alba* / *Schizachyrium scoparium* Woodland [CEGL006351] AND part of *Prunus serotina* - *Amelanchier canadensis* - *Quercus* spp. Shrubland Alliance – *Prunus serotina* - *Sassafras albidum* - *Amelanchier canadensis* / *Smilax rotundifolia* Shrubland [CEGL006145]; and PART OF *Pinus rigida* / *Carex pensylvanica* Woodland [CEGL006385], an anthropogenically derived association.

MA (old name):

Maritime Forest, Dune Subtype, Deciduous Forest; SNE Maritime Forest on Dunes/Maritime Juniper Forest and SNE Maritime Forest on Uplands/Maritime Oak Forest (in part - also Coastal forest).

ME:

Part of Sand dune community.

NH:

1998 - Maritime Dune Forest/Woodland, *Prunus serotina*-*Pinus rigida*/Amelanchier/Parthenocissus-Toxicodendron Forest/Woodland.

VT:

Not applicable.

NY:

Includes: In Part Maritime Oak-Holly Forest, Maritime Oak Forest, and Maritime red cedar forest; includes parts of Successional Maritime forest and Pitch pine- oak heath.

CT:

Pinus rigida - *Quercus stellata* Woodland. And *Quercus coccinea*- *Sassafras albidum*.

R1:

Within the Pitch Pine - Oak Forest and Oak - Pine Forest. And part of Maritime Shrubland.

Weatherbee:

Not applicable.

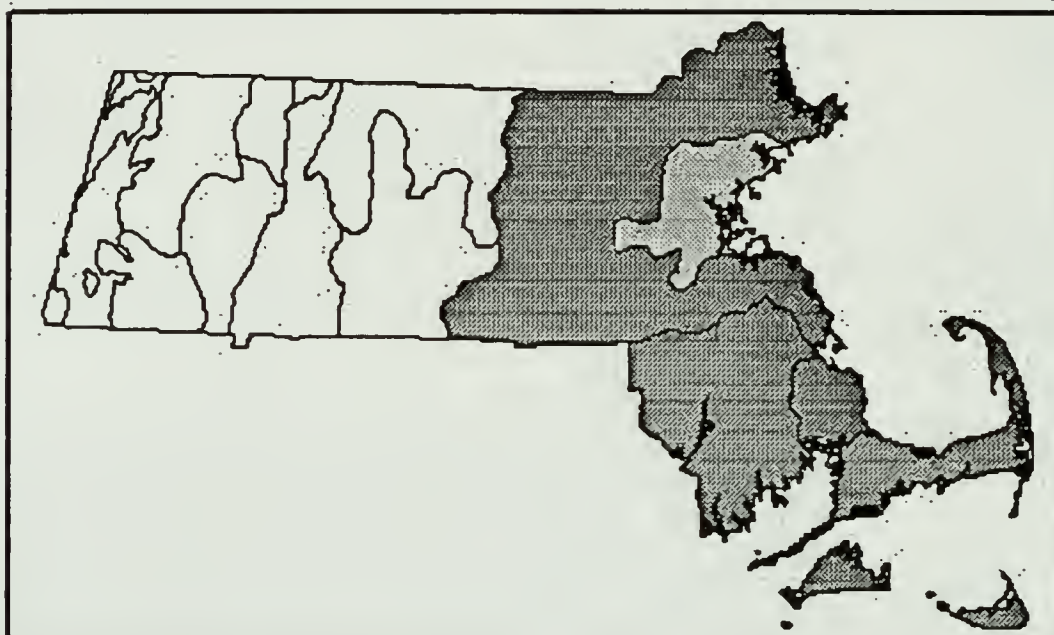
Author:

P. Swain

Date:

1/26/99

Community Name: COASTAL FOREST/WOODLAND
 Community Code: CT1A2A2000
 SRANK: S3
 Tracked: Yes



- Concept:** Coastal forests are often shorter than forests further inland, but taller than maritime forests. There is often a dense shrub layer and vines, particularly near the edges.
- Environmental Setting:** Communities are found in more protected areas along the coast, such as behind dunes and on slopes away from the water, and behind maritime forests. Coastal forests are sheltered from direct daily maritime influences [not in the daily salt spray zone, but receive wind and salt during storms]. The community occurs within the climate area moderated by being near the ocean, with warmer winters and cooler summers than more inland areas. Although they often occur on sand or bedrock that doesn't hold water, fogs and increased precipitation can produce more available water than further inland. Historically, fire was often an important factor in coastal forests. Coastal and maritime forests and maritime shrublands grade into each other, and into dunes and more inland forests.
- Vegetation Description:** Tree oaks (scarlet oak (*Quercus coccinea*), black oak (*Q. velutina*), white oak (*Q. alba*) and chestnut oak (*Q. prinus*)) are the dominant species of the coastal forest, with post oak (*Q. stellata*) important in the Buzzard's Bay and Island areas. Red maple (*Acer rubrum*), sassafras (*Sassafras albidum*), black cherry (*Prunus serotina*), tupelo (*Nyssa sylvatica*), beech (*Fagus grandifolia*), pitch pine (*Pinus rigida*), and white pine (*Pinus strobus*) commonly occur, usually in low percentages, but occasionally abundant. American Holly (*Ilex opaca*) is a regular associate in the southeastern Massachusetts occurrences of the coastal oak forest (where holly is abundant, the association may be called a coastal oak / holly forest). Red cedar (*Juniperus virginiana*) occurs in low percentages in the forests, and sometimes as a dominant in woodland thickets. A low-shrub heath layer dominated by low bush blueberries (*Vaccinium pallidum*, *V. angustifolium*) and black huckleberry (*Gaylussacia baccata*) is very characteristic. The herbaceous layer is typically sparse, with Pennsylvania sedge (*Carex pensylvanica*), bracken fern (*Pteridium aquilinum*), wintergreen (*Gaultheria procumbens*) and wild sarsaparilla (*Aralia nudicaulis*) being typical. Sweet pepper-bush (*Clethra alnifolia*), surprisingly, is abundant in many sites. Openings in the canopy produce a greater diversity of the herbaceous layer, where little blue-stem grass (*Schizachyrium scoparius*), Canadian rockrose (*Helianthemum canadense*), bush clovers (*Lespedeza* spp.), milkworts (*Lechea* spp.) and bearberry (*Arctostaphylos uva-ursi*) occur. Most occurrences of coastal forests have many vines on the edges and in openings of the forest. Poison ivy (*Toxicodendron radicans*), Virginia creeper (*Parthenocissus quinquefolia*), grape (*Vitis* spp.), and greenbriers (*Smilax* spp.) can be locally abundant.
- Associations:** Part of Oak - Pine forests. Includes White pine - oak - holly and white pine - oak - beech forests. Part of a continuum of dry, acidic communities that contain a variety of tree oak and pine species. More work is needed to define types.

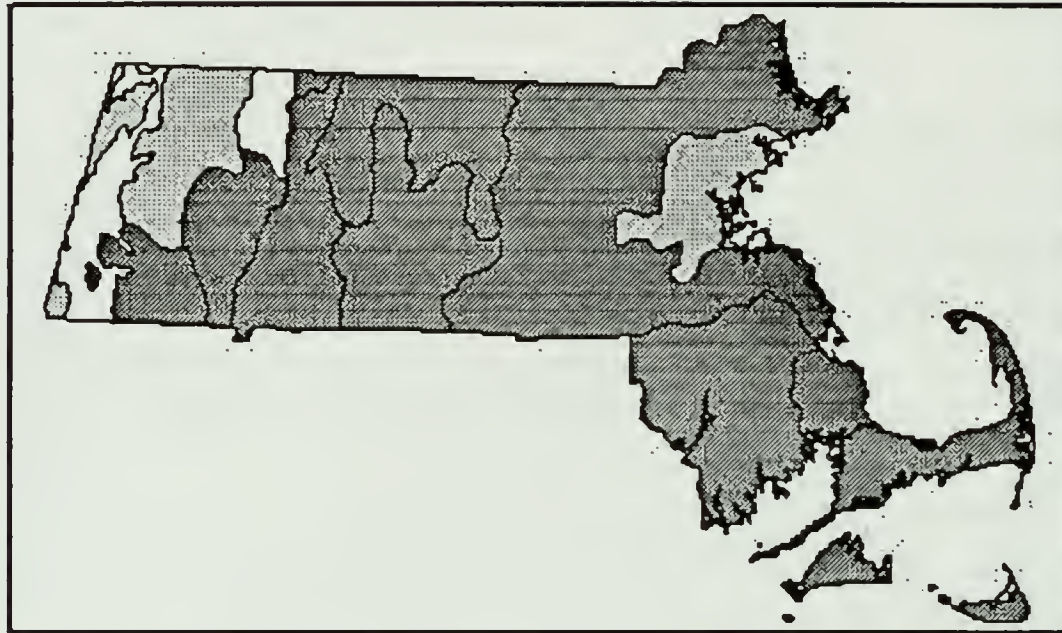
Habitat Values for Associated Fauna:	No animal species are restricted to coastal forests. Animal species are those of typical coastal oak areas such as the birds Rufous-sided Towhees (<i>Pipilo erythrophthalmus</i>), Gray Catbirds (<i>Dumetella carolinensis</i>), Common Yellowthroats (<i>Geothlypis trichas</i>), Ovenbird (<i>Seiurus aurocapillus</i>) and Black-and-white Warbler (<i>Mniotilta varia</i>). Small mammals such as meadow voles (<i>Microtus pennsylvanicus</i>), and white footed mice (<i>Peromyscus leucopus</i>), are common with gray squirrels (<i>Sciurus carolinensis</i>) common in mainland forests. Moths, butterflies, and other insects of the southeastern oak and oak-pine forest occur in the coastal forests. As in all communities on peninsulas such as Cape Cod, or on islands, the more remote occurrences have fewer species than those closer to the mainland sources.		
Associated Rare Plants:			
TIPULARIA DISCOLOR	CRANEFLY ORCHID		E
Associated Rare Animals:			
TERRAPENE CAROLINA	EASTERN BOX TURTLE		SC
Examples with Public Access:	Woods east side of Olde Barnstable Fairgrounds Golf Course, Barnstable; Provincetown Beech forest, Provincetown. Numerous sites on Martha's Vineyard.		
Threats:			
Management Needs:			
Inventory Need Rank:	2		
Inventory Comments:			
Synonyms:			
USNVC/TNC:	Quercus velutina - Q. alba Forest Alliance – Quercus coccinea- Q. velutina/ Sassafras albidum/ Vaccinium pallidum Forest [CEGL006375]; Fagus grandifolia- Quercus alba Forest Alliance – Quercus velutina- Fagus grandifolia- Sassafras albidum/ Ilex opaca Forest [CEGL006378]; Includes: Fagus grandifolia- Quercus alba Forest Alliance – Fagus grandifolia- Quercus alba- Liriodendron tulipifera- Carya spp. Forest [CEGL006075]; and Fagus grandifolia- Quercus alba- Q. rubra- Liriodendron tulipifera- Forest [CEGL006377]; and Fagus grandifolia/ Smilax rotundifolia Forest [CEGL006043]; and Quercus alba- (Quercus falcata, stellata) Forest Alliance – Quercus (falcata, alba, velutina)/ Gaylussacia baccata- Vaccinium pallidum Forest [CEGL006373]; Part of: Pinus rigida - Quercus (coccinea, velutina) Woodland Alliance – Pinus rigida - Quercus velutina / Hudsonia tomentosa Woodland [CEGL006120]; Pinus (rigida, echinata) - Quercus coccinea Forest Alliance Pinus rigida - Quercus coccinea / Vaccinium pallidum - (Myrica pensylvanica) Forest [CEGL006381]; Pinus strobus - Quercus (alba, rubra, velutina) Forest Alliance – Pinus strobus - Quercus alba - Ilex glabra Forest [CEGL006382].		
MA (old name):	MARITIME FOREST; and parts of SNE Dry Oak/Pine Forest on Sandy / gravelly soils.[CT2E1A0000]; and parts of CNE Mesic hardwood Forest on acidic bedrock / till [CT2G2B2000].		
ME:	parts of Oak- pine Woodlands Community and Oak - Pine Forest Community.		
NH:	part of: Dry Rich Appalachian oak- hickory- forest, Appalachian oak/ heath variant; in part: Beech Forest; in part: Pitch pine- Appalachian oak- /heath forest.		
VT:	not applicable		
NY:	Includes Maritime oak holly forest and related to Maritime oak forest, and includes parts of Successional Maritime forest; Included in part of Pitch pine-oak forest AND Pitch pine- oak heath Woodlands and Coastal oak- white pine forest.		
CT:	includes: Pinus rigida - Quercus stellata Woodland; Quercus velutina- (Q. prinus) forests – Q. velutina/ Gaylussacia baccata community And Q. velutina/ Vaccinium pallidum community; Pinus rigida - Quercus coccinea Woodlands, in part.		
RI:	part of Oak - pine forest and Pitch pine - Oak Forest.		
Weatherbee:	not applicable		
Author:	P. Swain	Date:	8/5/99

Community Name: **PITCH PINE - OAK FOREST**

Community Code: CT1A200000

SRANK: S5

Tracked: No



- Concept:** Dry oak / pine forest and woodlands of moraines, till, outwash, southerly exposures, and rocky slopes. Matrix forest of southeastern Massachusetts. The proportions of different species are variable, and range from predominantly pine with scattered oaks to predominantly oak with scattered pines. The structure ranges from open canopy with a thick understory, to closed canopy with scattered clumps of shrubs.
- Environmental Setting:** Dry, low nutrient, acidic soils of moraines and rocky slopes, also less disturbed sandplains, inland away from regular oceanic influences. Pitch pine - oak forests surround coastal plain ponds, pitch pine / scrub oak communities, and grade into coastal forests towards the ocean. The community is fire dependent, supporting increased white pine (*Pinus strobus*) and red maple (*Acer rubrum*) as time since the last fire increases. The time since fire or other disturbance is likely to be a factor in the proportion of pitch pine to oak.
- Vegetation Description:** Pitch pine - oak forests have a canopy of pitch pine and tree oaks (black (*Quercus velutina*), scarlet (*Q. coccinea*), chestnut oak (*Q. prinus*), and white (*Q. alba*)), with blueberries (*Vaccinium angustifolium* and *V. pallidum*), black huckleberry (*Gaylussacia baccata*) and other ericaceous shrubs forming an often continuous low shrub layer. Scattered patches of Scrub oak (*Quercus ilicifolia*) and bear oak (*Q. prinoides*) can be dense. Catbrier and other briars (*Smilax rotundifolia* and *Smilax* spp.) often make dense barriers around low, damp openings. The herb layer is generally sparse, with bracken fern (*Pteridium aquilinum*), wild sarsaparilla (*Aralia nudicaulis*), wintergreen (*Gaultheria procumbens*), Pennsylvania sedge (*Carex pensylvanica*), and, less commonly, pink lady's slipper (*Cypripedium acaule*). Occasional white pine (*Pinus strobus*) and red maple (*Acer rubrum*) contribute to the canopy.
- Associations:** Part of a continuum of dry, acidic communities that contain a variety of tree oak and pine species. More work is needed to define types.
- Habitat Values for Associated Fauna:** Supports many common and listed moths dependent on the oak and pine. The bird fauna is similar to that of oak woodlands: Rufous-sided Towhee (*Pipilo erythrophthalmus*), Pine Warbler (*Dendroica pinus*), and ruffed grouse (*Bonasa umbellus*) are common. Most common mammals of Massachusetts have at least part of their habitat in pitch - pine oak forests and none are particularly characteristic. [proposed for listing 2000, Orange Sallow Moth (*Rhodoecia aurantiago*) T]
- Associated Rare Plants:**
NONE KNOWN

Associated Rare Animals:

ANISOTA STIGMA	SPINY OAKWORM	SC
EACLES IMPERIALIS	IMPERIAL MOTH	T
TERRAPENE CAROLINA	EASTERN BOX TURTLE	SC

Examples with Public Access: Myles Standish State Forest, Carver/Plymouth; Hyannis ponds WMA, Barnstable; Francis Crane WMA, Falmouth; Montague Plains WMA, Montague.

Threats: Many acres have been lost resulting in fragmentation of occurrences. Fire exclusion is changing the character of the community, allowing less fire tolerant species to establish and sometimes results in more severe fires when they do occur.

Management Needs: Reintroduction of fire with prescribed fire in manageable conservation areas.

Inventory Need Rank: 3

Inventory Comments:

Synonyms:

USNVC/TNC: Pinus rigida - Quercus (coccinea, velutina) Woodland Alliance – Pinus rigida - Quercus (coccinea, velutina) /Schizachyrium scoparium Woodland [CEGL006166] and Pinus rigida - Quercus velutina / Hudsonia tomentosa Woodland [CEGL006120]; Pinus rigida - Quercus (velutina, prinus) Forest Alliance – Pinus rigida - Quercus (velutina, prinus) Lower New England, Northern Piedmont Forest [CEGL006290]; Pinus rigida - Quercus (alba, stellata) Woodland Alliance – no community described for New England.

MA (old name): part of SNE DRY OAK/PINE FOREST ON SANDY/GRAVELLY SOILS and part of SNE DRY OAK/PINE FORESTS ON ACIDIC BEDROCK OR TILL [CT2G2A1000]

ME: Includes parts of: Pitch pine Woodlands AND Oak- pine forest Community

NH: 1998 - Pitch pine- Appalachian oak/heath forest – Pinus rigida - Quercus (rubra, velutina, alba, coccinea) / heath. 1994 - Dry Pitch Pine-Appalachian Oak Forest

VT: included in: Pine-oak-heath sandplain forest

NY: Pitch pine - oak Forest

CT: Pinus rigida- Quercus coccinea Woodlands; also Quercus velutina - Pinus rigida forests; Pinus rigida - Quercus stellata Woodlands

RI: Pitch Pine - Oak forest

Weatherbee: part of: Dry Acidic Oak / Conifer Forest Community

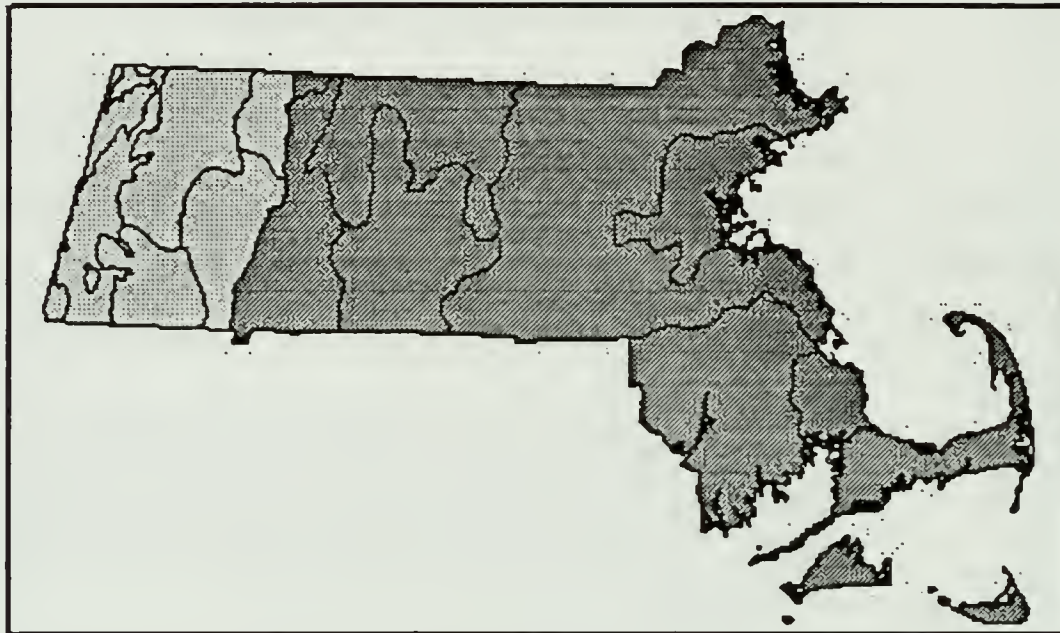
Author: P. Swain **Date:** 1/17/00

Community Name: **WHITE PINE - OAK FOREST**

Community Code: CT1A100000

SRANK: S5

Tracked: No



Concept: A forest of mixed dominance with oaks and white pine in the canopy.

Environmental Setting: On moraine or till, often dry but not very dry. Grades into Pine - Northern Hardwood to the north. In southern areas occurs near pitch pine - oak forests, and grades into them. Often in a successional sequence from successional white pine forests. Also grades into mixed oak forests. In southeastern areas overlaps with Coastal Forest types: White pine - oak - holly and white pine - oak - beech forests.

Vegetation Description: White pine (*Pinus strobus*) and oak species (*Quercus rubra*, *Q. velutina*, *Q. alba*, *Q. coccinea*, and *Q. prinus*) dominate the canopy layer in a variety of proportions. Pitch pine (*Pinus rigida*), red maple (*Acer rubrum*), white birch (*Betula papyrifera*) and black birch (*B. lenta*), occur regularly but in low numbers. Southern areas also have pignut hickory (*Carya glabra*) and Sassafras (*Sassafras albidum*). Chestnut (*Castanea dentata*) is frequently present as a shrubby tree. Usually has a prominent heath shrub layer, with lowbush blueberries (*Vaccinium angustifolium* and *V. pallidum*), huckleberry (*Gaylussacia baccata*), mountain laurel (*Kalmia latifolia*), sheep laurel (*K. angustifolia*). Other shrubs include maple-leaved viburnum (*Viburnum acerifolium*). Characteristic species of the sparse herb layer include bracken fern (*Pteridium aquilinum*), wild sarsaparilla (*Aralia nudicaulis*), Canada mayflower (*Maianthemum canadense*), wintergreen (*Gaultheria procumbens*), partridge-berry (*Mitchella repens*), pink lady's slipper (*Cypripedium acaule*), cow-wheat (*Melampyrum lineare*), and whorled loosestrife (*Lysimachia quadrifolia*).

Associations: Part of a continuum of dry, acidic communities that contain a variety of tree oak and pine species. More work is needed to define types.

Habitat Values for Associated Fauna: There are no species known to be restricted to the White Pine -Oak forest types, most animals in the forest are widespread generalists. Small mammals include white footed mice (*Peromyscus leucopus*), gray squirrels (*Sciurus carolinensis*) short-tailed shrew (*Blarina brevicauda*), red-backed vole (*Clethrionomys gapperi*), and chipmunks (*Tamias striatus*). Birds that nest in white pine -oak forests include Eastern Wood-Pewee (*Contopus virens*), Red-eyed Vireo (*Vireo olivaceus*), Brown Creeper (*Certhia americana*), Hermit Thrush (*Catharus guttatus*), and Red-tailed Hawks (*Buteo lineatus*). If a community occurrence contains vernal pools, newts and Spotted Salamanders (*Ambystoma maculatum*) will live in the humus of the forest floor for most of their adult lives.

Associated Rare Plants:

NONE KNOWN

Associated Rare Animals:

NONE KNOWN

Examples with Public Access: Myles Standish State Forest, Plymouth, Carver, Freetown State Forest, Freetown, Quabbin Reservation, Belchertown. Wachusett Meadow WS (MAS), Princeton.

Threats:

Management Needs:

Inventory Need Rank: 3

Inventory Comments: TNC NAC Matrix forest.

Synonyms:

USNVC/TNC: Pinus strobus - Quercus (rubra, velutina) - Fagus grandifolia Forest [CEGL006293] AND Quercus rubra - Q. prinus - Pinus strobus / Penstemon hirsutus Woodland [CEGL006074].

MA (old name): Part of: SNE DRY OAK/PINE FORESTS ON ACIDIC BEDROCK OR TILL [CT2G2A1000]; and part of: SNE DRY CENTRAL HARDWOOD FOREST ON ACIDIC BEDROCK OR TILL; and Part of: SNE MESIC OAK/PINE FOREST ON SANDY/GRAVELLY SOIL [CT2E2A0000].

ME: Included in: Oak - Pine forest community.

NH: Includes: Dry red oak - white pine / heath / bracken fern community.

VT: Part of: Pine - Oak - Heath Sandplain forest AND A northern variant is included in: Mesic pine-oak forest.

NY: Included in: Appalachian oak - pine forest.

CT: Not described.

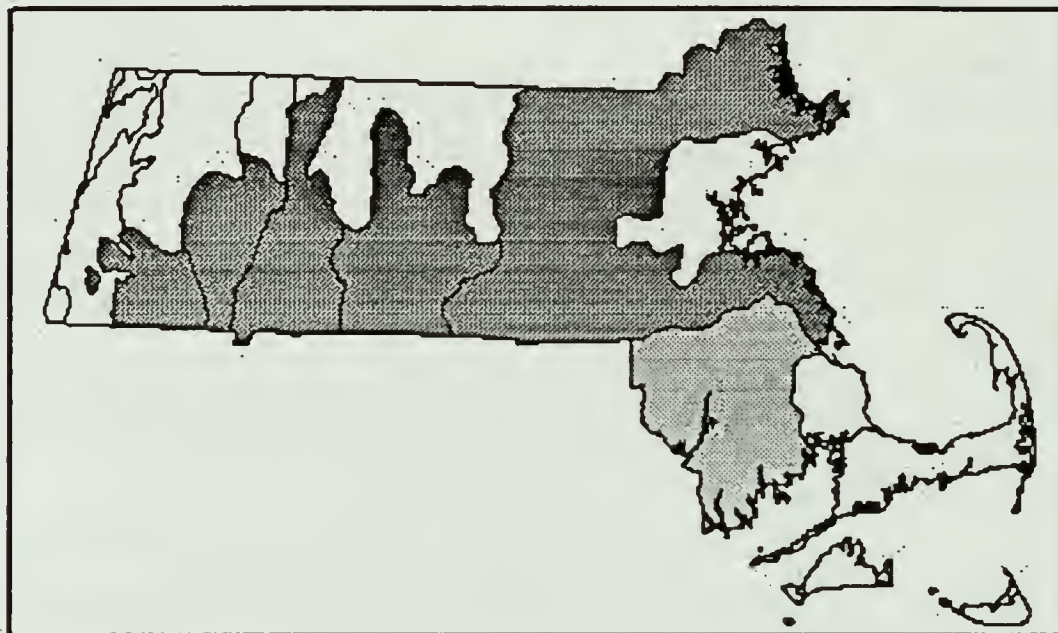
RI: Part of: Oak - pine forest.

Weatherbee: Dry Acidic Oak / conifer Forest community.

Author: P. Swain

Date: 8/31/99

Community Name: OAK - HEMLOCK - WHITE PINE FOREST
 Community Code: CT1B100000
 SRANK: S5
 Tracked: No



- Concept:** A mixed conifer - hardwood forest normally occurring in the southern part of the state, often on dry, acidic slopes.
- Environmental Setting:** Common on midslopes on rocky, shallow well-drained soils, with few nutrients. The dry oak -hemlock - white pine community is not sensitive to aspect. The community grades into northern hardwood - hemlock- white pine forests to the north and on moister sites, which typically have more hemlock. To the south and on drier sites, white pine - oak forest and mixed oak forest become more common.
- Vegetation Description:** Oaks (*Quercus alba*, *Q. prinus*, *Q. rubra*), black birch (*Betula lenta*), black cherry (*Prunus serotina*), and red maple (*Acer rubrum*) in association with hemlock (*Tsuga canadensis*) and white pine (*Pinus strobus*). Relative proportions of the species vary greatly among sites. Beech (*Fagus grandifolia*) is a common associate, and chestnut (*Castanea dentata*) sprouts are common. The shrub layer is patchy and sparse, with witch-hazel (*Hamamelis virginiana*), mountain laurel (*Kalmia latifolia*), lowbush blueberry (*Vaccinium angustifolium*), and maple-leaved viburnum (*Viburnum acerifolium*) characteristically present. The herbaceous layer also tends to be sparse and with little diversity: Indian cucumber (*Medeola virginiana*), wintergreen (*Gaultheria procumbens*), wild sarsaparilla (*Aralia nudicaulis*), wild oats (*Uvularia sessilifolia*), star flower (*Trientalis borealis*), and Canada Mayflower (*Maianthemum canadense*) are typical.
- Associations:** May be on the moister end of the continuum of dry, acidic communities that contain a variety of tree oak and pine species. More work is needed to define types.
- Habitat Values for Associated Fauna:** The fauna of this community is richer than but overlaps with that of the mixed oak communities. There is a large suite of neotropical migrant birds that are more likely to be found here, in some of the larger sites, including about 15-16 warblers, Eastern Wood-Pewee (*Contopus virens*), and Great Crested Flycatcher (*Miarchus crinitus*). Where mountain laurel occurs with beech trees, Black-throated Blue Warblers (*Dendroica caerulescens*) may occur, and if there are low spots with large trees and fairly dense shrubs, Canada Warblers (*Wilsonia canadensis*) often occur. In large sites, large mammals, such as bear and moose, occur with the forest as part of their habitat. Common small mammals include smoky shrew (*Sorex fumeus*), masked shrew (*S. cinereus*), short-tailed shrew (*Blarina brevicauda*), woodland jumping mouse (*Napaeozapus insignis*), white-footed mouse (*Peromyscus leucopus*), and gray squirrels (*Sciurus carolinensis*), chipmunks (*Tamias striatus*), and red squirrels (*Tamiasciurus hudsonicus*), where hemlock are dominant. Amphibians would include the ubiquitous Northern Redback Salamanders (*Plethodon cinereus*) and red efts, the juvenile stage of red-spotted newts (*Notophthalmus v. viridescens*).

Associated Rare Plants:

NONE KNOWN

Associated Rare Animals:

NONE KNOWN

Examples with Public Access: Hiram Fox WMA, Worthington; East Brimfield Lake Property, ACOE, Brimfield; Conant Brook Dam Property, ACOE, Monson.

Threats:

Management Needs:

Inventory Need Rank: 3

Inventory Comments:

Synonyms:

USNVC/TNC: Pinus strobus -Tsuga canadensis Forest Alliance – Pinus strobus - Tsuga canadensis Lower New England, Northern Piedmont Forest [CEGL006320]; Includes: Tsuga canadensis - Betula alleghaniensis Forest Alliance – Tsuga canadensis - Fagus grandifolia Forest [CEGL006088].

MA (old name): CNE MESIC TRANSITIONAL FOREST ON SANDY/GRAVELLY SOILS.

ME: Related to: Hemlock slope forest community.

NH: Acidic, hemlock- beech- oak- pine forest.

VT: Not described.

NY: Included in: Appalachian oak-pine forest.

CT: Included in: Tsuga canadensis forests.

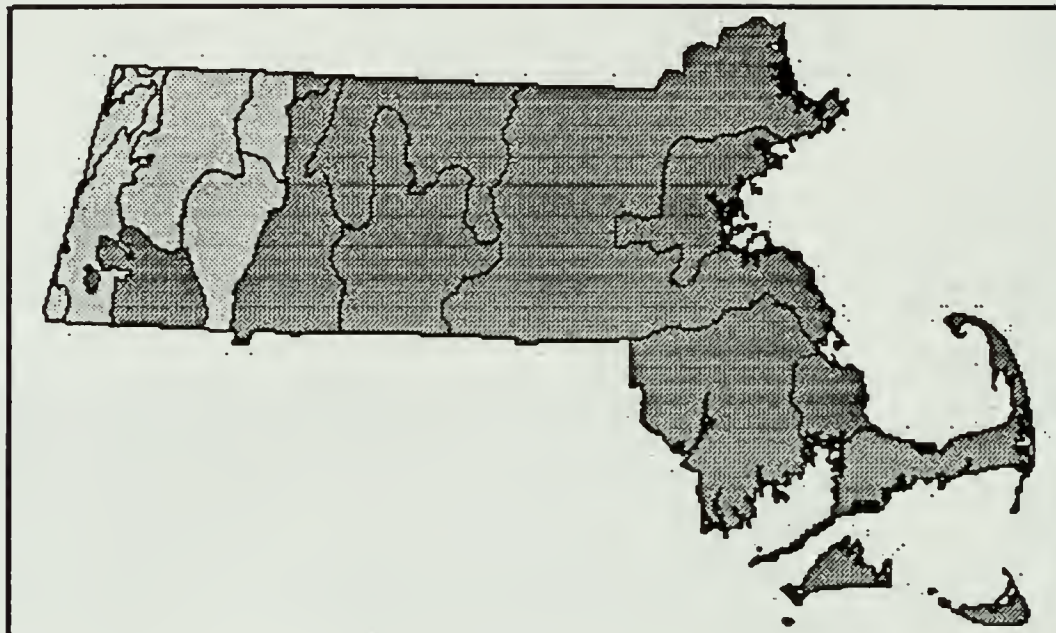
RI: Related to: Hemlock - Hardwood Forest.

Weatherbee: Part of: Mesic Acidic Oak / Conifer Forest Community.

Author: P. Swain

Date: 8/31/99

Community Name: **SUCCESSIONAL WHITE PINE FOREST**
 Community Code: CT1A1A0000
 SRANK: S5
 Tracked: No



Concept: Old field white pine, several decades since establishment. Other species co-occur with the white pine, but seldom share dominance. The forest floor is often carpeted with needles, with only a thin herbaceous layer.

Environmental Setting: Abandoned agricultural land, usually pasture. Sometimes selective logging maintains the pine as a dominant.

Vegetation Description: White pine (*Pinus strobus*) dominated forest, with scattered white oak (*Quercus alba*), red oak (*Quercus rubra*), and red maple (*Acer rubrum*) in the canopy. The shrub layer is variable density, from sparse to thick: Elderberry (*Sambucus canadensis*), black cherry (*Prunus serotina*), maple-leaved viburnum (*Viburnum acerifolium*), and often non-native species such as buckthorn (*Rhamnus frangula*), honeysuckle (*Lonicera morrowii*), or/and multiflora rose (*Rosa multiflora*). A variety of blackberry vines (often forming thickets), and poison ivy (*Toxicodendron radicans*) often covers the ground near openings or in formerly open disturbed areas. Low bush blueberries (*Vaccinium angustifolium* and *V. pallidum*) form patches, mixed with black huckleberry (*Gaylussacia baccata*), on sites with less disturbed soils. The herbaceous layer is variable; large patches of Canada mayflower (*Maianthemum canadensis*), and starflower (*Trientalis borealis*) with clubmosses (*Lycopodium obscurum* and related species) are particularly common on formerly plowed soil. Bracken fern (*Pteridium aquilinum*) is often common. Partidgeberry (*Mitchella repens*), fringed polygala (*Polygala uniflora*), and pink lady slipper (*Cypripedium acaule*) grow in many longer established sites.

Associations:

Habitat Values for Associated Fauna: Blackburnian warblers (*Dendroica fusca*) are probably the bird species most closely associated with dense white pine forests. Other birds of the community include Ovenbird (*Seiurus aurocapillus*), Yellow Warbler (*D. dominica*), Cooper's Hawk (*Accipiter cooperii*), and Northern Goshawk (*Accipiter gentilis*); as well as generalists such as the Black-capped Chickadee (*Poecile atricapillus*), Ovenbird (*Seiurus aurocapillus*), and Red-breasted Nuthatch (*Sitta canadensis*).

Associated Rare Plants:

LYGODIUM PALMATUM

CLIMBING FERN

SC

Associated Rare Animals:

NONE KNOWN

Examples with Public Access: Townsend State Forest, Townsend; Douglas State Forest, Douglas; Oxbow NWR./ Harvard.

Threats: Non-native species such as buckthorn (*Rhamnus frangula*), Morrow's honeysuckle (*Lonicera morrowii*), and privet (*Ligustrum obtusifolium*).

Management Needs: Remove exotics from good examples.

Inventory Need Rank: 3

Inventory Comments:

Synonyms:

USNVC/TNC: Pinus strobus – Pinus strobus/ Vaccinium spp. Forest [CEGL002444].

MA (old name): In part: SNE Dry oak/pine forest on sandy / gravelly soils.

ME: Part of: Early successional forest community. Within: Pine - Hemlock / Spruce Forest Community AND within: Oak - Pine Forest Community.

NH: 1997 - Similar to Pine part of Dry red oak - white pine / heath / bracken fern forest AND partially Included in Hemlock-beech-oak-pine forest – Tsuga-Fagus-Quercus rubra- Pinus strobus / Hamamelis / Gaultheria - Medeola - typic hemlock - beech - oak - pine variant; 1994 - Included in: Transition Hardwood - Conifer formation, part of Dry transitional oak - White Pine Forest.

VT: Included in: Mesic pine-oak forest AND included in: Pine - Oak - Heath Sandplain Forest.

NY: Included in: Appalachian Oak - pine forest.

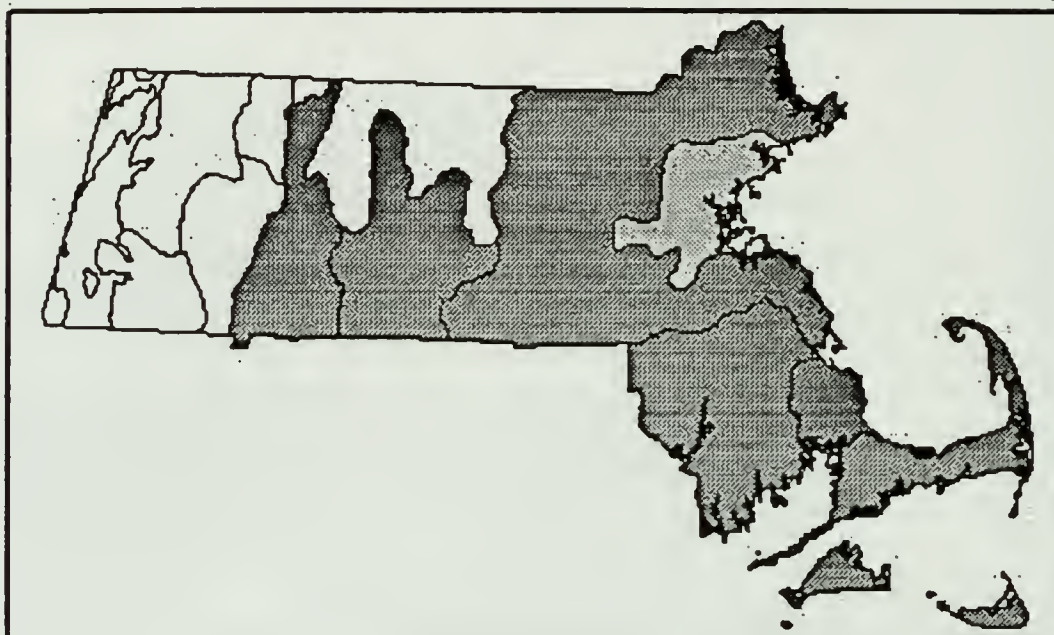
CT: Not described.

RI: within: Oak - Pine Forest.

Weatherbee: Within: Dry Acidic oak/conifer Forest Community.

Author: P. Swain **Date:** 8/19/99

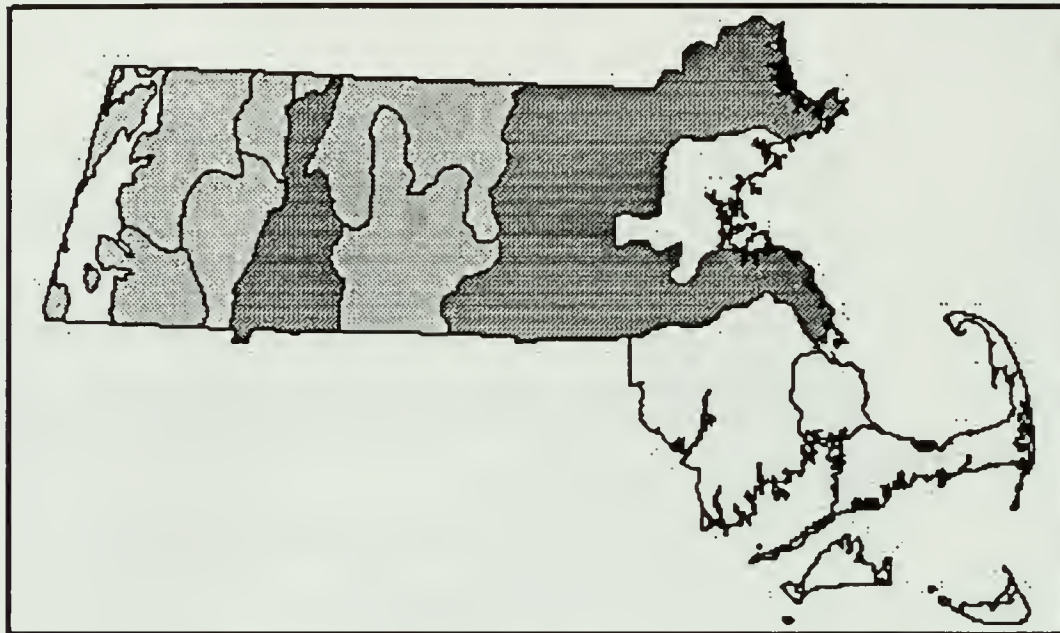
Community Name: MIXED OAK FOREST
Community Code: CT1A300000
SRANK: S5
Tracked: No



- Concept:** A broadly defined community of tree oaks that grades into other more narrowly defined communities. Includes areas with open canopies that could be considered woodlands.
- Environmental Setting:** The community often occurs in areas that burn regularly. Tends to be on dry soils, and exposed slopes.
- Vegetation Description:** A variable mix of oak species dominate the canopy: black oak (*Quercus velutina*), scarlet oak (*Q. coccinea*), red oak (*Q. rubra*), chestnut oak (*Q. prinus*), and white (*Q. alba*). The canopy is somewhat open. An understory of saplings of canopy species, as well as gray birch (*Betula populifolia*), aspen (*Populus tremuloides*), big-toothed aspen (*Populus grandidentata*), black birch (*Betula lenta*), red maple (*Acer rubrum*), and chestnut (*Castanea dentata*) is dense in patches. Blueberries (*Vaccinium angustifolium* and *V. pallidum*), huckleberry (*Gaylussacia baccata*), sweet fern (*Comptonia peregrina*), scrub oak (*Quercus ilicifolia*), and mountain laurel (*Kalmia latifolia*) is also dense in patches. A scattered herbaceous layer includes Pennsylvania sedge (*Carex pensylvanica*), wild sarsaparilla (*Aralia nudicaulis*), poverty grass (*Danthonia spicata*), pinweed (*Lechea intermedia*), and pale corydalis (*Corydalis sempervirens*).
- Associations:** Part of a continuum of dry, acidic communities that contain a variety of tree oak and pine species. More work is needed to define types.
- Habitat Values for Associated Fauna:** Acorns are important for wildlife including white-tailed deer (*Odocoileus virginianus*), black bear (*Ursus americanus*), grey squirrels (*Sciurus carolinensis*), and other small rodents. Birds include Wild Turkeys (*Meleagris gallopavo*). The understory of blueberries and huckleberries is used by many of these same species in areas with sufficiently large forests to provide all the habitat needs. Passerine birds of oak forests include Red-eyed Vireo (*Vireo olivaceus*), Ovenbird (*Seiurus aurocapillus*), Black-and-white Warbler (*Mniotilta varia*), Scarlet Tanager (*Piranga olivacea*), Great Crested Flycatcher (*Miarchus crinitus*), Downy Woodpecker (*Picoides pubescens*), Hairy Woodpecker (*P. villosus*) and Red-bellied Woodpecker (*Melanerpes carolinus*). Amphibians expected include Northern Redback Salamanders (*Plethodon cinereus*), and Spotted Salamanders (*Ambystoma maculatum*). Ringneck Snake (*Diadophis punctatus*) and Redbelly Snake (*Storeria occipitomaculata*) would be expected.
- Associated Rare Plants:**
NONE KNOWN
- Associated Rare Animals:**
NONE KNOWN

Examples with Public Access: Mt. Tekoa WMA, Russell; Minute Man National Historic Park, Lexington; Douglas SF, Douglas.
Threats:
Management Needs:
Inventory Need Rank: 3
Inventory Comments:
Synonyms:
USNVC/TNC: *Quercus prinus* - (*Quercus coccinea*, *Quercus velutina*) Forest Alliance -- *Quercus (pinus, velutina)* / *Gaylussacia baccata* Forest [CEGL006282]
MA (old name): SNE MESIC OAK/PINE FOREST ON ACIDIC BEDROCK OR TILL and CNE DRY HARDWOOD FOREST ON ACIDIC BEDROCK OR TILL [CT2G2A2000]
ME: Part of Oak - pine Forest Community and related to Oak - Hickory Forest community.
NH: 1997: Dry Appalachian oak-hickory forest, including Appalachian oak/heath variant. 1994: Dry Appalachian Oak - Hickory Forest, sub type Appalachian Oak - Heath forest.
VT: Pine-oak-heath sandplain forest.
NY: related to: Oak-tulip tree forest, Appalachian oak-pine forest.
CT: ?*Quercus velutina* - (*Quercus prinus*) Forests
RI: Part of Oak - Pine Forest and Oak - Hickory forest.
Weatherbee: Included in: Dry acidic oak/conifer forest community.
Author: P. Swain **Date:** 8/31/99

Community Name:	RIDGETOP CHESTNUT OAK
Community Code:	CT1A3A0000
SRANK:	S4
Tracked:	No



Concept:	Open forest of dry ridgetops, dominated by chestnut oak with an often dense understory of scrub oak, heaths or mountain laurel.	
Environmental Setting:	Dry upland sites with thin soil over acidic bedrock on ridges and upper south or southwest facing slopes. There tends to be deep oak leaf litter with slow decomposition.	
Vegetation Description:	The canopy is dominated, often completely, by chestnut oak (<i>Quercus prinus</i>). Associates include other oaks (black (<i>Q. velutina</i>), red (<i>Q. rubra</i>), scarlet (<i>Q. coccinea</i>), and/or white (<i>Q. alba</i>)), hickories (shagbark (<i>Carya ovata</i>) and pignut (<i>C. glabra</i>)), red maple (<i>Acer rubrum</i>), hemlock (<i>Tsuga canadensis</i>), and white and pitch pines (<i>Pinus strobus</i> and <i>P. rigida</i>). Red cedar (<i>Juniperus virginiana</i>), scrub oak (<i>Q. ilicifolia</i>), dwarf chinquapin oak (<i>Q. prinoides</i>), blueberries (<i>Vaccinium angustifolium</i> and <i>V. pallidum</i>), huckleberry (<i>Gaylussacia baccata</i>), and mountain laurel (<i>Kalmia latifolia</i>) often form dense thickets. The herbaceous layer is usually sparse, but includes false foxgloves (<i>Aureolaria flava</i> , <i>A. pedicularia</i> , and <i>A. virginica</i>), sedges (particularly <i>Carex pensylvanica</i>), bracken fern (<i>Pteridium aquilinum</i>), and wintergreen (<i>Gaultheria procumbens</i>).	
Associations:	Although fairly distinctive because of the ridgetop position, this is part of a continuum of dry, acidic communities that contain a variety of tree oak and pine species. More work is needed to define types.	
Habitat Values for Associated Fauna:	Chestnut oak acorns are particularly sought after by wildlife and are important food for white-tailed deer (<i>Odocoileus virginianus</i>), black bear (<i>Ursus americanus</i>), grey squirrels (<i>Sciurus carolinensis</i>), other small rodents, and Wild Turkeys (<i>Meleagris gallopavo</i>) and other birds. The understory of blueberries and huckleberries is used by many of these same species in areas with sufficiently large forests to provide all the habitat needs. Passerine birds of oak forests include Red-eyed Vireo (<i>Vireo olivaceus</i>), White-breasted Nuthatch (<i>Sitta carolinensis</i>), Ovenbird (<i>Seiurus aurocapillus</i>), Black-and-white Warbler (<i>Mniotilta varia</i>), Scarlet Tanager (<i>Piranga olivacea</i>), Great Crested Flycatcher (<i>Miarchus crinitus</i>), and Downy Woodpecker (<i>Picoides pubescens</i>).	
Associated Rare Plants:	NONE KNOWN	
Associated Rare Animals:		
ELAPHE OBSOLETA	BLACK RAT SNAKE	E
Examples with Public Access:	Rocky Mountain Park, Greenfield; Blue Hills Reservation, Milton. Mt. Toby, Leverett.	

Threats:

Management Needs:

Inventory Need Rank: 3

Inventory Comments: Related to oak / pine forests and other ridgetop communities.

Synonyms:

USNVC/TNC: Quercus prinus - Quercus coccinea, Quercus velutina Forest Alliance – Quercus prinus - Quercus (rubra, velutina) / Gaylussacia baccata forest [CEGL006282].

MA (old name): PART OF: SNE DRY OAK/PINE FORESTS ON ACIDIC BEDROCK OR TILL

ME: Included in: Oak - pine Woodland Community

NH: Included in: Appalachian oak- pine Rocky ridge Woodland /barren; and part of Semi-rich Appalachian oak- sugar maple forest

VT: Included in: Dry oak Woodland

NY: Chestnut oak forest

CT: Part of: Quercus velutina - (Q. prinus) forests – Quercus velutina / Gaylussacia baccata community

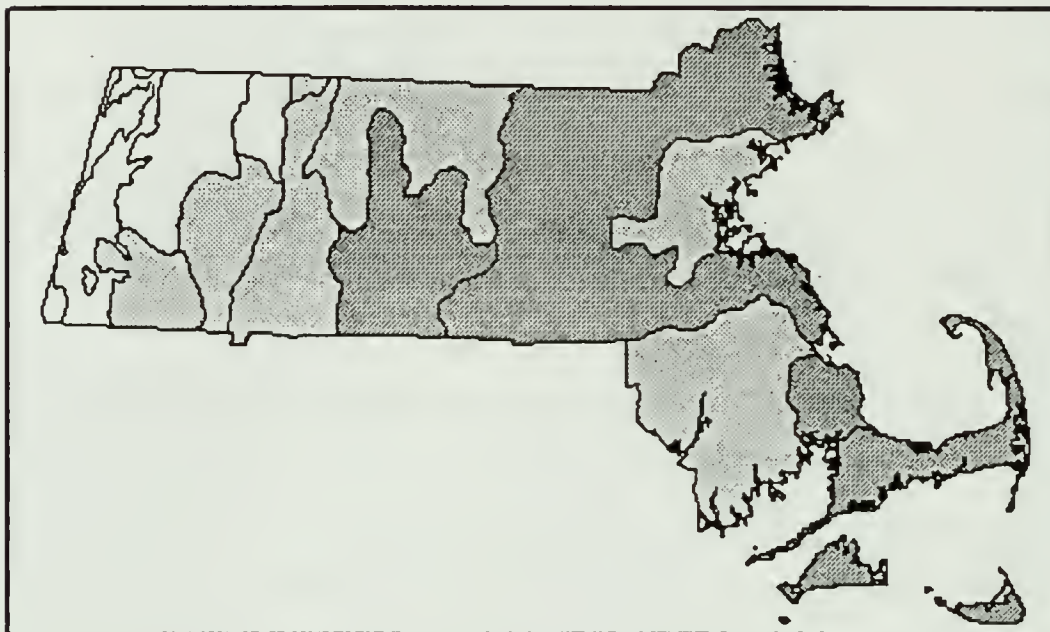
RI: Chestnut Oak forest

Weatherbee: Not described

Author: P. Swain

Date: 8/23/99

Community Name: **BLACK OAK - SCARLET OAK FOREST / WOODLAND**
Community Code: CT1A3B0000
SRANK: S3S4
Tracked: No



- Concept:** A fairly open oak / heath community maintained by regular light fire.
- Environmental Setting:** A community of dry, sandy or rocky slopes, but also on other xeric sites. Grades into mixed oak and pine-oak forests, and more open communities. Except on the driest sites, without regular fire the community tends to change to include more white oak, chestnut oak, red oak, and hickories. Without fire, there tends to be deep oak leaf litter with slow decomposition.
- Vegetation Description:** Black oak (*Quercus velutina*) is the dominant canopy species. White oak (*Q. alba*) and red maple (*Acer rubrum*) are common associates. A sparse subcanopy may have species of recent disturbance such as grey birch (*Betula populifolia*), black cherry (*Prunus serotina*), and sassafras (*Sassafras albidum*), as well as species less tolerant of fire such as flowering dogwood (*Cornus florida*) or shadbush (*Amelanchier arborea*). Lowbush blueberries, (*Vaccinium angustifolium* and *V. pallidum*), huckleberry (*Gaylussacia baccata*), and scrub oak (*Quercus ilicifolia*) form a fairly dense, but clumped low shrub layer, with scattered maple-leaved viburnum (*Viburnum acerifolium*) and American hazelnut (*Corylus americana*). Sedges (such as *Carex pensylvanica*), bracken fern (*Pteridium aquilinum*), and pink lady's slipper (*Cypripedium acaule*) are often scattered in the open herbaceous layer. On Martha's Vineyard, black oak grows with white oak (*Q. alba*) and post oak (*Q. stellata*) in open, savanna-like woodlands with dense heath understories, in mosaics with grasslands, heathlands, and scrub oak communities.
- Associations:** Part of a continuum of dry, acidic communities that contain a variety of tree oak and pine species. More work is needed to define types.
- Habitat Values for Associated Fauna:** Black oak acorns are important food for white-tailed deer (*Odocoileus virginianus*), black bear (*Ursus americanus*), grey squirrels (*Sciurus carolinensis*), other small rodents, and Wild Turkeys (*Meleagris gallopavo*) and other birds. The understory of blueberries and huckleberries is used by many of these same species in areas with sufficiently large forests to provide all the habitat needs. Passerine birds of oak forests include Red-eyed Vireo (*Vireo olivaceus*), White-breasted Nuthatch (*Sitta carolinensis*), Ovenbird (*Seiurus aurocapillus*), Black-and-white Warbler (*Mniotilta varia*), Scarlet Tanager (*Piranga olivacea*), Great Crested Flycatcher (*Myiarchus crinitus*), and Downy Woodpecker (*Picoides pubescens*). [Listing proposed 2000, (*Rhodoecia aurantiago*) Orange Sallow Moth T]
- Associated Rare Plants:**
NONE KNOWN

Associated Rare Animals:

APODREPANULATRIX LIBERARIA

NEW JERSEY TEA INCHWORM

T

Examples with Public Access: Green Hill Park, Worcester; Broad Meadow Brook Wildlife Sanctuary, Worcester; Quabog WMA, Brookfield; Manuel F. Correllus State Forest, Martha's Vineyard.

Threats: fire suppression, severe wildfire, and exotics.

Management Needs: Prescribed fire, exotic removal.

Inventory Need Rank: 2

Inventory Comments:

Synonyms:

USNVC/TNC: Quercus velutina - Q. alba Forest Alliance – Quercus coccinea- Q. velutina/ Sassafras albidum/ Vaccinium pallidum Forest [CEGL006375].

MA (old name): BLACK OAK SAVANNA.

ME: Not described.

NH: Part of: 1997 - Dry Rich Appalachian oak- hickory- forest, Appalachian oak/ heath variant.

VT: Part of: Dry oak Woodlands.

NY: part of: Appalachian Oak - pine forest.

CT: Quercus velutina - (Quercus prinus) Forests – Quercus velutina/ Gaylussacia baccata community and Quercus velutina / Vaccinium pallidum community.

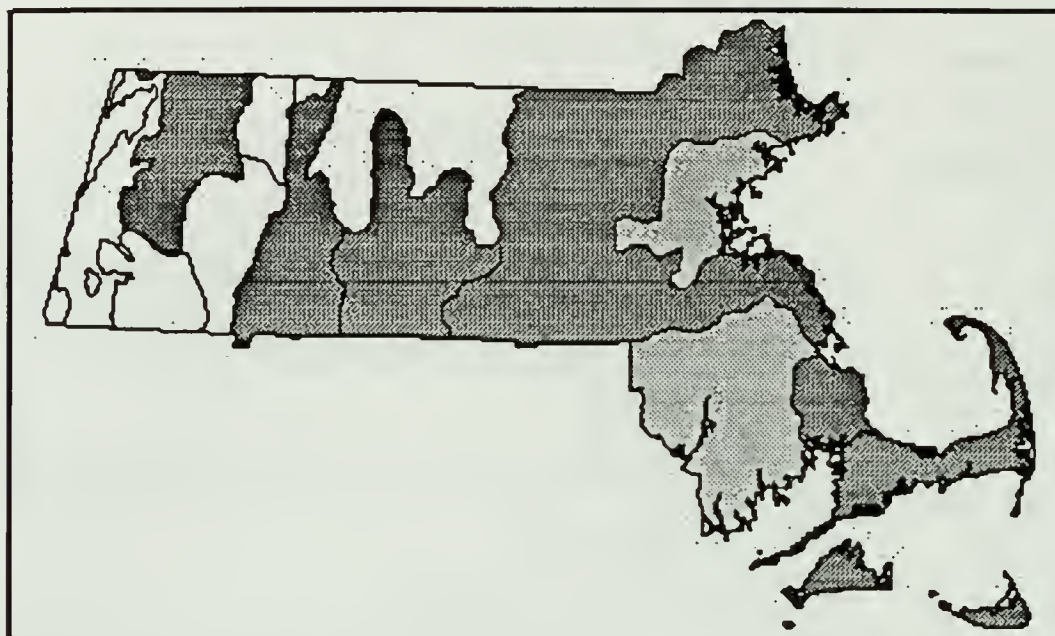
RI: Mixed oak - pine forest.

Weatherbee: Not described.

Author: P. Swain

Date: 8/23/99

Community Name: OAK - HICKORY FOREST
Community Code: CT1B2B0000
SRANK: S4
Tracked: No



- Concept:** A hardwood forest dominated by a mixture of oaks with hickories mixed in at a lower density.
- Environmental Setting:** Well drained sites, such as upper slopes, ridgetops, usually with west and south-facing aspects.
- Vegetation Description:** A broadly defined, variable, forest type. The canopy is dominated by one or several oaks (*Quercus rubra*, *Q. alba*, *Q. coccinea*, and *Q. velutina*). Mixed in are lower densities of one or several hickories (*Carya ovata*, *C. tomentosa*, *C. glabra*, and *C. ovalis*). Other trees include ash (*Fraxinus americana*), black birch (*Betula lenta*), sassafras (*Sassafras albidum*), and red maple (*Acer rubrum*). A subcanopy commonly includes hop hornbeam (*Ostrya americana*), flowering dogwood (*Cornus florida*), shadbush (*Amelanchier arborea*), chestnut (*Castanea dentata*), and witch-hazel (*Hamamelis virginiana*). Low shrubs are common and often diverse: maple-leaved viburnum (*Viburnum acerifolium*), blueberries (*Vaccinium angustifolium* and *V. pallidum*), beaked and American hazelnut (*Corylus cornuta* and *C. americana*), New Jersey tea (*Ceanothus americanus*), and gray dogwood (*Cornus racemosa*) are characteristically present. The herbaceous layer is also richer than in many oak forests. Plants typical of the herbaceous layer include Hepatica (*Hepatica nobilis*), goldenrod (*Solidago bicolor*), tick-trefoil (*Desmodium glutinosum* and *D. paniculatum*), wild sarsaparilla (*Aralia nudicaulis*), rattlesnake weed (*Hieracium venosum*), and false Solomon's seal (*Maianthemum racemosum*), and Pennsylvania sedge (*Carex pensylvanica*).
- Associations:** Part of a continuum of dry, acidic communities that contain a variety of tree oak and pine species. More work is needed to define types. Hickory is seldom dominant enough to warrant being part of the name.
- Habitat Values for Associated Fauna:** Wild turkey (*Meleagris gallopavo*) are found in primarily oak areas. Dry oak forests support a smaller mix of animal species than are found in moister communities. There are no species known to be restricted to the Oak Hickory Forest community. Common species of dry sites include short-tailed shrew (*Blarina brevicauda*), red-backed vole (*Clethrionomys gapperi*), white footed mouse (*Peromyscus leucopus*), and chipmunks (*Tamias striatus*). Snakes of dry forest sites include garter snakes (*Thamnophis s. sirtalis*) and redbelly snakes (*Storeria o. occipitomaculata*). Birds that nest in oak forests include Eastern Wood-Pewee (*Contopus virens*), Red-eyed Vireo (*Vireo olivaceus*), Scarlet Tanager (*Piranga olivacea*), and Ovenbird (*Seiurus aurocapillus*).

Associated Rare Plants:

ACER NIGRUM	BLACK MAPLE	SC
CERASTIUM NUTANS	NODDING CHICKWEED	E
ISOTRIA MEDEOLOIDES	SMALL WHORLED POGONIA	E
LESPEDEZA VIOLACEA	VIOLET BUSH-CLOVER	- WL
LYGODIUM PALMATUM	CLIMBING FERN	SC
RANUNCULUS FASCICULARIS	EARLY BUTTECUP	- WL
SPHENOPHOLIS NITIDA	SHINING WEDGEGRASS	T

Associated Rare Animals:

NONE KNOWN

Examples with Public Access: Blue Hills Reservation, Milton; Minute Man National Historic Park, Lexington; Stacy Mountain, Gill; East Mountain WMA, Holyoke; Mt. Tekoa WMA, Russell; Mt. Meadow Preserve, Williamstown; Cape Cod Canal, Bourne.

Threats:**Management Needs:**

Inventory Need Rank: 3

Inventory Comments: Widespread type. Not clear how distinct from mixed oak forest, coastal forest, or oak - white pine.

Synonyms:

USNVC/TNC: Quercus alba- (Quercus rubra, Carya spp.) Forest Alliance – Quercus (alba, rubra, velutina)/ Cornus florida/ Viburnum acerifolium Forest [CEGL006336].

MA (old name): SNE MESIC CENTRAL HARDWOOD FOREST ON ACIDIC TILL.

ME: Similar to: Red oak - white oak forest.

NH: 1997 - Oak-hickory Forests; 1994 - Dry Appalachian Oak - Hickory Forest; AND Dry Appalachian Oak - Hickory Forest, Appalachian Oak / Herb Variant.

VT: Similar to: Mesic Transition Hardwood Forest (Oak-Hickory-Northern Hardwood Forest). and Dry oak-hickory-hop-hornbeam forest

NY: Appalachian oak - hickory forest

CT: Quercus rubra/ Cornus florida forests; AND Carya glabra - Fraxinus americana forests

RI: Oak Hickory forest

Weatherbee: Included in: Dry acidic oak/conifer forest community

Author: P. Swain

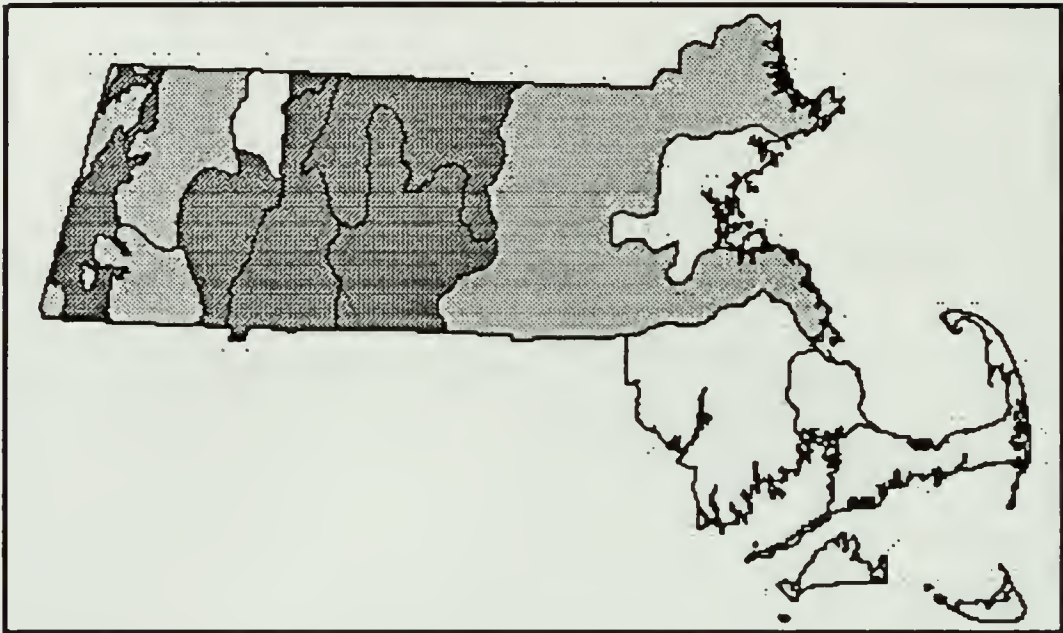
Date: 8/5/99

Community Name: HICKORY - HOP HORNBEAM FOREST / WOODLAND

Community Code: CT1B2B1000

SRANK: S2

Tracked: Yes



Concept: Mixed hardwood, open forests with a sparse shrub layer. A nearly continuous cover of graminoids includes a rich diversity of herbaceous flora.

Environmental Setting: Occurrences of the community are usually small (a few acres), on thin, well drained soils, generally in midslope on southern or eastern exposures below balds and rock outcrops on traprock ridges. The community occurs as pockets separated by oak forests growing on deeper, moister soils in erosion channels. There is great variation in environmental conditions among sites.

Vegetation Description: Hickory - hop hornbeam communities are fairly open forests dominated by a variable mixture of hardwoods, including sugar maple (*Acer saccharum*), white ash (*Fraxinus americana*), and red oak (*Quercus rubra*), Shagbark, pignut and Sweet pignut hickories (*Carya ovata*, *C. glabra*, and *C. ovalis*), and Hop-hornbeam (*Ostrya virginiana*) as a regular and abundant subcanopy tree. The forest floor is characteristically covered by Pennsylvania sedge (*Carex pensylvanica*), other sedges (*C. pedunculata* and *C. laxiflorae* spp), and grasses such as bottlebrush grass (*Elymus hystrix*), Poverty grass (*Danthonia spicata*) and the non-native Canada bluegrass (*Poa compressa*) with scattered violets (*Viola triloba*), hepaticas (*Hepatica nobilis* var. *obtus*a), and several species of tick-trefoils (including *Desmodium glutinosum* and *D. paniculatum*).

Associations:

Habitat Values for Associated Fauna: These are small community occurrences, and tend to be part of the habitat of species using the surrounding forests. Species of dry sites are most likely to occur in the community occurrences.

Associated Rare Plants:

OXALIS VIOLACEA	VIOLET WOOD-SORREL	T
POA LANGUIDA	DROOPING SPEARGRASS	E
SPHENOPHOLIS NITIDA	SHINING WEDGEGRASS	T

Associated Rare Animals:

NONE KNOWN

Examples with Public Access: Joseph Skinner State Park, Hadley; Mount Holyoke Range State Park, Amherst; Mt. Toby, Sunderland; Wachusett Meadow WS (MAS), Princeton.

Threats:

Management Needs:

Inventory Need Rank: 3

Inventory Comments: Motzkin surveyed Connecticut Valley sites.

Synonyms:

USNVC/TNC: Carya (glabra, ovata)- Fraxinus americana- Quercus (alba, rubra) Forest Alliance – Carya (glabra, ovata)- Ostrya virginiana/ Carex pensylvanica Forest [CEGL006301].

MA (old name): SNE DRY RICH FOREST - Hickory - hop hornbeam forest variant.

ME: Not described.

NH: Related to : Dry Appalachian oak- hickory- forest, Rich Appalachian oak- hickory talus forest Woodlands; and Dry red oak-ironwood/sedge variant of Dry acidic oak-(hickory)-pine types.

VT: Within: Dry oak- hickory-hop-hornbeam.

NY: Within: Appalachian oak-hickory forest.

CT: Similar to: Carya glabra- Fraxinus americana/ Carex pensylvanica Community.

RI: Within Oak - Hickory Forest.

Weatherbee: An association within Dry Calcareous Oak / Conifer Forest Community

Author: P. Swain

Date: 8/10/99

Community Name: DRY, RICH ACIDIC OAK FOREST

Community Code: CT1B1B0000

SRANK: S4

Tracked: No



Concept: Deciduous, predominantly oak forest with a rich understory of herbaceous plants and graminoids. The shrub layer has fewer ericaceous plants than other oak forests.

Environmental Setting: Often steep slopes with warm, southwest exposure. Soil is enriched due to overwash and downslope movement of nutrients. Best developed on less acidic rocks.

Vegetation Description: Mesic to dry oak forest of slightly acid, often rocky soils of intermediate fertility, occurring on well-drained loams on mid-slopes and coves. Tree canopy is dominated by a mixture of oaks (*Quercus rubra*, *Q. velutina*, and *Q. alba*), sugar and red maple (*Acer saccharum* and *A. rubrum*), white ash (*Fraxinus americana*), and shagbark and other hickories (*Carya ovata*, *C. glabra*, and *C. ovalis*). Flowering dogwood (*Cornus florida*) and hop-hornbeam (*Ostrya americana*) form an open subcanopy. A fairly sparse shrub layer includes saplings of canopy tree species and maple-leaved viburnum (*Viburnum acerifolium*). A rich herbaceous flora includes perfoliate bellwort (*Uvularia perfoliata*), four-leaved milkweed (*Asclepias quadrifolia*), early meadow-rue (*Thalictrum dioicum*), false foxgloves (*Aureolaria flava*, *A. pedicularia*, and *A. virginica*), wild coffee (*Triosteum aurantiacum*), bush clovers (including *Lespedeza procumbens*), tick-trefoils (*Desmodium rotundifolium* and others), and sedges such as *Carex retroflexa*.

Associations: On the rich end of the oak forest continuum but part of the problem of dry, acidic communities that contain a variety of tree oak and pine species. More work is needed to define types.

Habitat Values for Associated Fauna: Dry oak forests support a smaller mix of animal species than are found in moister communities. There are no species known to be restricted to the Dry, Rich Acidic Oak Forest community. Common species of dry sites include short-tailed shrew (*Blarina brevicauda*), red-backed vole (*Clethrionomys gapperi*), white footed mouse (*Peromyscus leucopus*), and chipmunks (*Tamias striatus*). Snakes of dry forest sites include garter snakes (*Thamnophis s. sirtalis*) and redbelly snakes (*Storeria o. occipitomaculata*). Birds that nest in dry oak forests include Eastern Wood-Pewee (*Contopus virens*), Red-eyed Vireo (*Vireo olivaceus*), Scarlet Tanager (*Piranga olivacea*), and Ovenbird (*Seiurus aurocapillus*).

Associated Rare Plants:

RANUNCULUS MICRANTHUS	TINY-FLOWERED BUTTERCUP	T
SPHENOPHOLIS NTIDA	SHINING WEDGEGRASS	T

Associated Rare Animals:

NONE KNOWN

Examples with Public Access: None identified on public lands.

Threats: Exotics, barberry (*Berberis thunbergii*) is reported from several sites.

Management Needs: Removal of exotics in exemplary cases.

Inventory Need Rank: 2

Inventory Comments:

Synonyms:

USNVC/TNC: Quercus rubra- Acer saccharum - (Quercus alba) Forest Alliance – Acer saccharum- Quercus rubra \ Hepatica nobilis var. obtusa Forest [CEGL006046]; close to Carya (glabra, ovata) - Fraxinus americana - Quercus (alba, rubra) Forest Alliance – Carya (glabra, ovata) - Fraxinus americana - Quercus spp. Central Appalachian forest.

MA (old name): SNE DRY RICH FOREST ON ACIDIC/CIRCUMNEUTRAL BEDROCK OR TILL.

ME: Within Oak-Hickory Forest.

NH: Semi-rich Appalachian oak- sugar maple forest .

VT: Includes Transition hardwoods Talus Woodland; related to Dry oak-hickory-hop-hornbeam forest.

NY: Part of Appalachian oak-hickory forest.

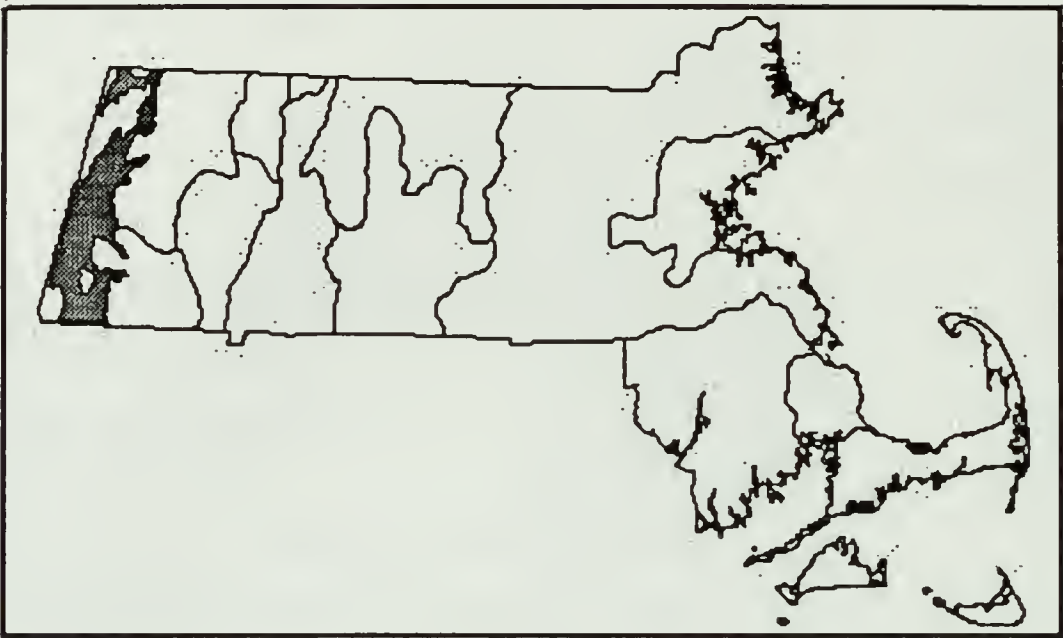
CT: Related to Acer saccharum - Fraxinus americana / Hepatica americana community.

RI: Within Oak - Hickory Forest.

Weatherbee: Within, or a variant of, Dry Calcareous Oak/Conifer Forest Community.

Author: P. Swain **Date:** 8/5/99

Community Name: YELLOW OAK DRY CALCAREOUS FOREST
Community Code: CT1B2A0000
SRANK: S2
Tracked: Yes



Concept: A dry, often open, oak - sugar maple forest with rich understory on shallow rock.
Environmental Setting: Well - drained slopes or low ridges underlain with calcareous rocks. The community tends to be more abundant in southern parts of the calcareous areas of the state (*Berkshire County*), and is more restricted to south and southwest facing slopes in more northern parts of *Berkshire County*.
Vegetation Description: Yellow oak (*Quercus muehlenbergii*) is characteristic of this community, and primarily occurs in it in Massachusetts. It grows mixed with sugar maple (*Acer saccharum*), white oak (*Q. alba*) and black oak (*Q. velutina*), and associated with white ash (*Fraxinus americana*) and shagbark hickory (*Carya ovata*). Scattered white pines (*Pinus strobus*) and red oak (*Q. rubra*) occur regularly. Hop hornbeam (*Ostrya virginiana*), hackberry (*Celtis occidentalis*), flowering dogwood (*Cornus florida*) and, in the more southerly sites, bladdernut (*Staphylea trifolia*), are subcanopy trees that grow in the fairly open understory, with occasional prickly ash (*Zanthoxylum americanum*). The herbaceous layer tends to be rich in species, including four-leaved milkweed (*Asclepias quadrifolia*), sickle-pod (*Arabis canadensis*), thread-leaved sedge (*Carex eburnea*), broad-leaved ragwort (*Senecio obovatus*), wild geranium (*Geranium maculatum*). In open (*disturbed*) areas, red cedar (*Juniperus virginiana*) and aspen (*Populus tremuloides*) may be common, often with non-native species. Although black maple (*Acer nigrum*) is associated with this community in the Midwest, it seldom occurs in this community in Massachusetts where black maple tends to be associated with moister conditions.

Associations:

Habitat Values for Associated Fauna: The fauna tends to be that of generally dry forests, but with no species restricted to the Yellow Oak Dry Calcareous forest.

Associated Rare Plants:

LESPEDeza VIOLACEA	VIOLET BUSH-CLOVER	- WL
PENSTEMON HIRSUTUS	HAIRY BEARDTONGUE	E
POA LANGUIDA	DROOPING SPEARGRASS	E
QUERCUS MUEHLENBERGII	YELLOW OAK	SC
VIBURNUM RAFINESQUIANUM	DOWNY ARROWWOOD	T
WALDSTEINIA FRAGARIOIDES	BARREN STRAWBERRY	SC

Associated Rare Animals:

NONE KNOWN

Examples with Public Access: Appalachian Trail, Sheffield; Bartholomew's Cobble Reservation (TTOR), Sheffield.

Threats: Exotic species do well in disturbed forests - Asian bittersweet (*Celastrus orbiculatus*), buckthorn (*Rhamnus frangula*) shrub honeysuckle (*Lonicera morrowii*), and other invasive species can displace native species and change the structure of forests.

Management Needs: Exotic control on best examples.

Inventory Need Rank: 2

Inventory Comments: mostly in Berkshire County which has been well surveyed by Weatherbee.

Synonyms:

USNVC/TNC: Acer saccharum - Quercus muehlenbergii Forest Alliance – Acer saccharum - Quercus muehlenbergii Forest [Provisional] [CEGL005010]; OR Quercus muehlenbergii - (Acer saccharum) Forest Alliance – Quercus muehlenbergii Woodland Alliance – Quercus muehlenbergii / Andropogon gerardii - Anemone cylindrica Woodland [CEGL006230] OR [CEGL003704] Quercus muehlenbergii Woodland [Placeholder].

MA (old name): in part SNE DRY RICH FOREST ON ACIDIC/CIRCUMNEUTRAL BEDROCK OR TILL - or aspects of CNE mesic hardwood forest on acidic till.

ME: Not described.

:NH: Not described.

VT: Within: Transition Hardwoods, and Related to: Temperate Calcareous Outcrop Community and Transition Hardwoods Woodland.

NY: includes part of Oak Openings; included within Appalachian oak-hickory forest.

CT: Acer saccharum - Quercus muehlenbergii forests [no communities defined].

RI: Not described.

Weatherbee: Dry Calcareous Oak / Conifer Forest Community.

Author: P. Swain **Date:** 8/4/99 forests

Community Name: HEMLOCK RAVINE COMMUNITY

Community Code: CT1C1C0000

SRANK: S4

Tracked: No



Concept: Dense canopies with 80 to 100% closure, dominated by hemlocks. Little understory grows in the shade of the hemlocks.

Environmental Setting: Moist, usually north facing, slopes, or along north facing ravines. Usually acidic rock. Occasional rock outcrops in the ravines.

Vegetation Description: A hemlock (*Tsuga canadensis*) dominated community. This community usually occurs within the oak - hemlock - white pine communities. Occasional deciduous trees that grow with the hemlock, at very low percentages, include mixed oaks (scarlet, red, white, and black) (*Quercus coccinea*, *rubra*, *alba*, and *velutina*), and red maple (*Acer rubrum*). The shrub layer is sparse, with occasional individuals of the canopy species and small patches of mountain laurel (*Kalmia latifolia*). The herbaceous layer is essentially non-existent. The forest floor is covered by needles, twigs, and small branches.

Associations:

Habitat Values for Associated Fauna: The Acadian Fly-catcher (*Empidonax virescens*) is a near obligate to Hemlock forests in Massachusetts, although its habitats are broader to the north. Other species that use the hemlock community tend to be northern or conifer preferring forest species, including such birds as Black-throated Green Warbler (*Dendroica virens*), Blackburnian warbler (*D. fusca*), Louisiana Waterthrush (*Seiurus motacilla*), and Winter Wren (*Troglodytes troglodytes*). In the winter, mixed flocks are common with chickadees (*Poecile atricapillus*), kinglets (*Regulus* spp.), and nuthatches (*Sitta* spp.). Mammals include those that are widespread and typical of northern and coniferous forests: red squirrels (*Tamiasciurus hudsonicus*), red-backed voles (*Clethrionomys gapperi*), smoky shrew (*Sorex fumeus*), and white-footed mouse (*Peromyscus leucopus*).

Associated Rare Plants:

NONE KNOWN

Associated Rare Animals:

NONE KNOWN

Examples with Public Access: Mount Holyoke Range State Forest, Amherst; East Brimfield Lake Property, ACOE, Brimfield; Conant Brook Dam, ACOE Property, Monson.

Threats: Hemlock hosts the non-native Woolly Adelgid, which usually kills a hemlock tree after it is fully infested. Pre-infestation salvage of areas expected to be targets.

Management Needs:

Inventory Need Rank: 3

Inventory Comments:

Synonyms:

USNVC/TNC: Tsuga canadensis Forest Alliance – Tsuga canadensis - (Betula alleghaniensis) Mesic Forest [CEGL002598]; Tsuga canadensis - Betula alleghaniensis Forest Alliance – Tsuga canadensis - Betula alleghaniensis - Picea rubens / Cornus canadensis Forest [CEGL006129].

MA (old name): Included IN: CNE MESIC CONIFER [Transition] FOREST ON ACIDIC BEDROCK/TILL.

ME: Hemlock slope Forest Community.

NH: 1997 Hemlock Forest and Hemlock-red spruce-(yellow birch) ravine/terrace slope variant of Hemlock-spruce-northern hardwood forest; 1994 - Hemlock Forest.

VT: part of Hemlock Forest.

NY: part of Hemlock-northern hardwood forest.

CT: Tsuga canadensis forests, no communities defined

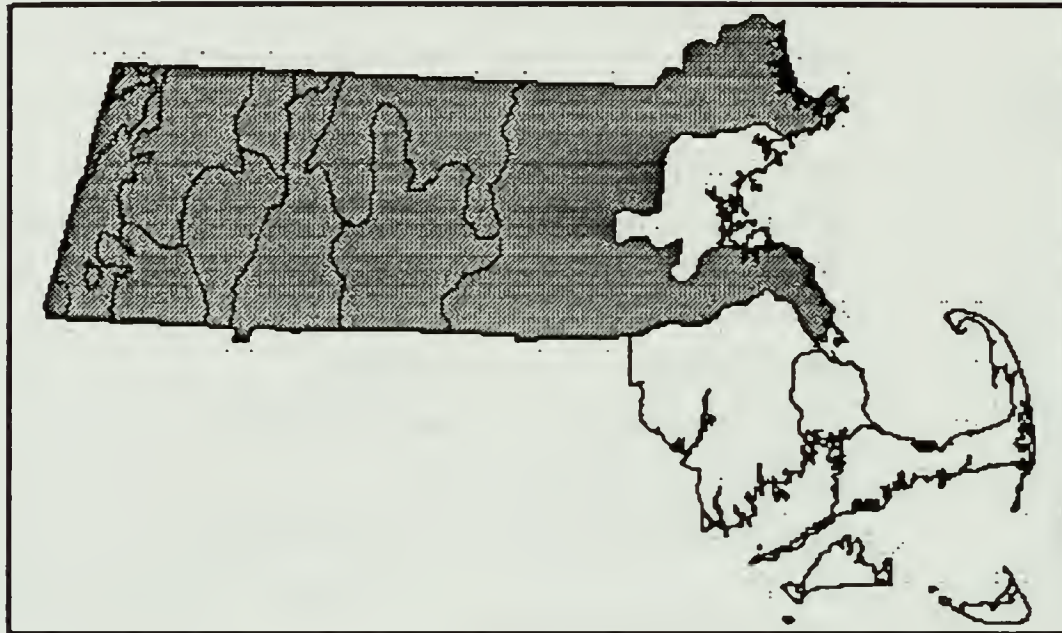
RI: part of Hemlock - Hardwood Forest.

Weatherbee: part of Mesic Northern Hardwood Forest Community

Author: P. Swain

Date: 1/11/00

Community Name: NORTHERN HARDWOODS - HEMLOCK – WHITE PINE FOREST
 Community Code: CT1C000000
 SRANK: S5
 Tracked: No



- Concept:** Closed canopy dominated by a mix of evergreen and deciduous trees, with sparse shrub and herbaceous layers.
- Environmental Setting:** Widespread in dry to mesic, moderately acidic conditions with moderate levels of nutrients. North facing slopes and ravines, and northern areas.
- Vegetation Description:** The community type ranges from Hemlock in pure stands to a deciduous forest with scattered hemlocks. There are variable combinations of hemlock (*Tsuga canadensis*), sugar maple (*Acer saccharum*), yellow birch (*Betula alleghaniensis*), black cherry (*Prunus serotina*), and red oak (*Quercus rubra*), and white pine (*Pinus strobus*). There are often scattered paper birch (*Betula papyrifera*), aspen (*Populus tremuloides*), red maple (*Acer rubrum*), and yellow birch (*Betula alleghaniensis*). The shrub layer is usually open, but, often containing scattered clumps of hobblebush (*Viburnum lantanoides*), red-berried elderberry (*Sambucus racemosa* ssp. *pubens*), fly-honeysuckle (*Lonicera canadensis*), and striped maple (*Acer pensylvanicum*). The herbaceous layer is sparse, but fairly diverse, with intermediate woodfern (*Dryopteris intermedia*), Christmas fern (*Polystichum acrostichoides*), clubmosses (*Lycopodium* spp.), Canada mayflower (*Maianthemum canadense*), white wood aster (*Aster divaricatus*), and wild sarsaparilla (*Aralia nudicaulis*). Occasional spring herbaceous species include painted trillium (*Trillium undulatum*), early yellow violet (*Viola rotundifolia*), broad-leaved spring beauty (*Claytonia caroliniana*), and trout-lily (*Erythronium americanum*).
- Associations:**
- Habitat Values for Associated Fauna:** Many animal species use parts of this type of forest, but geographical variation, structure, size, and local conditions will affect which actual species are present. Many species of neo-tropical migrant songbirds nest in large numbers in larger occurrences, including a variety of warblers. Blackburnian warblers (*Dendroica fusca*) are particularly closely associated with hemlock stands. Northern Goshawk (*Accipiter gentilis*), Barred Owl (*Strix varia*), and Pileated Woodpeckers (*Dryocopus pileatus*) are also to be expected. Mammals include red squirrels (*Tamiasciurus hudsonicus*), gray squirrel (*Sciurus carolinensis*), chipmunks (*Tamias striatus*), redbacked vole (*Clethrionomys gapperi*), short-tailed shrew (*Blarina brevicauda*), masked and smoky shrews (*Sorex cinereus* and *S. fumeus*), and white-footed mouse (*Peromyscus leucopus*). At elevation, deer mouse (*P. maniculatus*) and woodland jumping mouse (*Napaeozapus insignis*) also occur in the forest type. Amphibians include redbacked salamanders (*Plethodon cinereus*) and wood frogs (*Rana sylvatica*); and expected reptiles include redbelly snakes (*Storeria o. occipitomaculata*).

Associated Rare Plants:

SOLIDAGO GLUTINOSA SSP RANDII

RAND'S GOLDENROD

E

Associated Rare Animals:

SOREX PALUSTRIS

WATER SHREW

SC

Examples with Public Access:

Mohawk Trail S.F., Charlemont; Jug End WMA, Egremont; Holyoke Range State Park, Amherst; Carlisle State Forest, Carlisle; Mt. Toby, Sunderland.

Threats:

Exotics do well in the community. 1999- Hemlock hosts the non-native Woolly Adelgid, which usually kills a hemlock tree after it is fully infested.

Management Needs:

Exotic control.

Inventory Need Rank:

3

Inventory Comments:

Widespread.

Synonyms:

USNVC/TNC:

Acer saccharum - *Betula alleghaniensis* - (*Fagus grandifolia*) Forest Alliance – *Acer saccharum* - *Betula alleghaniensis* - *Fagus grandifolia* / *Viburnum lantanoides* Forest [CEGL006252]; *Tsuga canadensis* - *Betula alleghaniensis* Forest Alliance – *Tsuga canadensis* - *Fagus grandifolia* Forest [CEGL006088]; and *Tsuga canadensis* - *Betula alleghaniensis* Lower New England, Northern Piedmont Forest [CEGL006109]; *Pinus strobus* - *Tsuga canadensis* Forest Alliance – *Pinus strobus* - *Tsuga canadensis* Lower New England, Northern Piedmont Forest [CEGL006328].

MA (old name):

Included in: CNE MESIC CONIFER [Transition] FOREST ON ACIDIC BEDROCK/TILL and CNE DRY TRANSITIONAL FOREST ON SANDY / GRAVELLY SOILS [CT2E1B0000].

ME:

Mixed hardwood - conifer forest; Hemlock slope community.

NH:

Parts of: Hemlock - beech -oak- pine forest; AND Semi - rich mesic sugar maple - beech forest;
Includes: Hemlock forest; 1994 - Beech forest, Beech - Birch - Maple forest, and Semi - rich Mesic Forest

VT:

Mesic northern Hardwood forest [Beech - Birch - Maple forest] AND White Pine - Northern Hardwood forest; Part of Hemlock forest.

NY:

Hemlock - northern hardwood forest AND Pine - northern hardwood forest.

CT:

Acer saccharum - *Fagus grandifolia* - *Betula alleghaniensis* forests – *Acer saccharum* - *Fagus grandifolia* / *Viburnum alnifolia* community AND *Acer saccharum* - *Fagus grandifolia* / *Dryopteris intermedia* community AND *Acer saccharum* - *Fraxinus americana* - *Tilia americana* forests - *Acer saccharum* *Fraxinus* / *Asarum canadensis* community AND *Acer saccharum* - *Fraxinus americana* / *Osmunda claytoniana* community AND *Acer saccharum* - *Fraxinus americana* / *Dryopteris noveboracensis* community; AND part of *Tsuga canadensis* Forests.

RI:

Hemlock - Hardwood Forest

Weatherbee:

Mesic Northern Hardwood Forest Community.

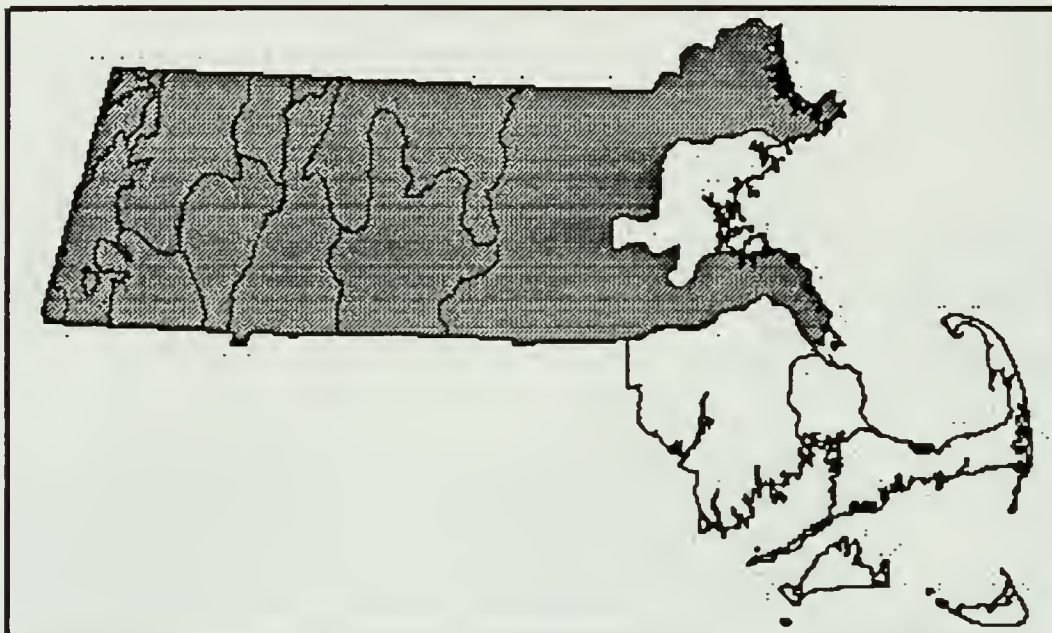
Author:

P. Swain

Date:

8/27/99

Community Name: SUCCESSIONAL NORTHERN HARDWOODS
Community Code: CT1C1B0000
SRANK: S5
Tracked: No



Concept: A broadly defined time sequence of forest communities, from thick young sprouts with little diversity to mature, diversifying forests with undergrowth of more shade tolerant trees. The canopy is seldom completely closed and undergrowth may be dense or open.

Environmental Setting: Areas with past major disturbance such as cutting, hurricane, or fire within northern hardwood forest areas.

Vegetation Description: Aspen (*Populus tremuloides*), white birch (*Betula papyrifera*), red maple (*Acer rubrum*), and /or black cherry (*Prunus serotina*) dominate the community. Gray birch (*Betula populifolia*) tends to be more common on very well drained soils. Pin cherry (*Prunus pensylvanica*) is a common associate. As the forest matures, the understory is made up of young trees of more shade tolerant species. Shrubs and herbaceous species are variable, and depend on surrounding seed sources and the type of disturbance the established the early successional community.

Associations:

Habitat Values for Associated Fauna: The structure of a community is important to animals. Successional communities change in structure quite quickly, and the animals change as the vegetation grows, and there is a sequence of use. For 0 to 10 years trees are dense but small, often with blackberry (*Rubus* spp.) below. Fugitive bird species such as Chestnut-sided Warblers (*Dendroica pensylvanica*) and Mourning Warbler (*Oporornis philadelphia*) are common in the first 5 years after a major disturbance even, especially if there are dead snags left for singing perches. Grouse (*Bonasa umbellus*) and woodcock (*Scolopax minor*) are classic users of younger forest, as is the New England cottontail (*Sylvilagus transitionalis*). After 30 years, the community should include most commonly found mammals.

Associated Rare Plants:

NONE KNOWN

Associated Rare Animals:

NONE KNOWN

Examples with Public Access: Birch Hill Wildlife Management Area, Athol.

Threats:

Management Needs:

Inventory Need Rank: 3

Inventory Comments:

Synonyms:

USNVC/TNC: Populus tremuloides - Betula papyrifera Forest Alliance – Populus (tremuloides, grandidentata) - Betula (populifolia, papyrifera) Forest [CEGL006303] AND Populus tremuloides - Betula papyrifera / Acer saccharum - Mixed Hardwoods Forest [CEGL002468]; Betula papyrifera Forest Alliance–Betula papyrifera / Acer saccharum - Mixed hardwoods Forest [CEGL002464].

MA (old name): Part of: CNE MESIC HARDWOOD FOREST ON ACIDIC BEDROCK/TILL.

ME: Early successional forest community.

NH: successional stages not recognized.

VT: successional stages not recognized, part of Northern Hardwoods Forests.

NY: Successional Northern Hardwoods.

CT: Not described.

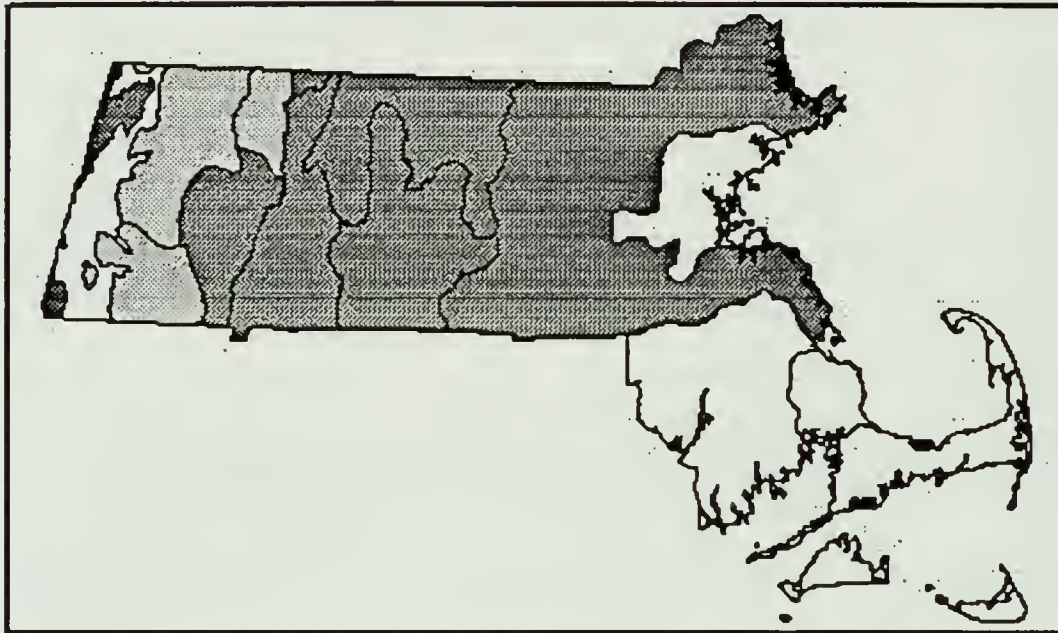
RI: successional stages not recognized.

Weatherbee: part of Mesic Northern Hardwood Forest Community.

Author: P. Swain

Date: 1/11/00

Community Name: RED OAK - SUGAR MAPLE TRANSITION FOREST
Community Code: CT1B300000
SRANK: S4
Tracked: No



- Concept:** Forests with species of northern hardwoods (*maples*) and central hardwoods (*oaks*) together. Has few of the extreme northern or southern indicators.
- Environmental Setting:** Mesic forests of mid slopes, moderate nutrient availability, and not very acidic. Some sites, especially with abundant white pine, are old field successional, and others have been managed as woodlots and were selectively cut in the past, or may continue to be logged to the present. The understory reflects the history of the sites.
- Vegetation Description:** Northern red oak (*Quercus rubra*), sugar maple (*Acer saccharum*), beech (*Fagus grandifolia*), and black birch (*Betula lenta*), with an admixture of white pine (*Pinus strobus*) and hemlock (*Tsuga canadensis*) dominate the canopy in variable proportions. White oak (*Quercus alba*), red maple (*Acer rubrum*), white ash (*Fraxinus americana*), and yellow birch (*B. alleghaniensis*) are regular associates. Striped maple (*Acer pensylvanicum*), maple-leaved viburnum (*Viburnum acerifolium*), and hobblebush (*Viburnum lantanoides*) are typical shrubs of primary transition forests, and lowbush blueberry (*Vaccinium angustifolium*), is abundant in the more coniferous dominated sites. The herbaceous layer is neither dense nor sparse, often with patches of clonal species, includes wild sarsaparilla (*Aralia nudicaulis*), bracken fern (*Pteridium aquilinum*), hay scented fern (*Dennstaedtia punctilobula*), clubmosses (*Lycopodium clavatum* and *L. obscurum*), Indian cucumber (*Medeola virginiana*), Canada mayflower (*Maianthemum canadense*), and whorled wood-aster (*Aster acuminatus*).
- Associations:**
- Habitat Values for Associated Fauna:** This widespread forest type provides habitat to many, particularly to opportunistic, animal species. White-tailed deer (*Odocoileus virginianus*) are classic users of this forest type, although certainly not limited to it. Fisher (*Martes pennanti*) use larger, older examples. Many species move through the forest between other, specific habitats: frogs and salamanders breed in vernal pools and other wetlands and use the uplands in the rest of the year. Most of the widespread small mammals would be expected in larger occurrences of the community.
- Associated Rare Plants:**
NONE KNOWN
- Associated Rare Animals:**
NONE KNOWN

Examples with Public Access: Harvard Forest, Petersham; Jug End WMA, Egremont; East facing slopes of Taconics, northern Berkshire County.

Threats:

Management Needs:

Inventory Need Rank: 3

Inventory Comments:

Synonyms:

USNVC/TNC: Quercus rubra - Acer saccharum - (Q. alba) Forest Alliance – Acer saccharum - Quercus rubra / Hepatica nobilis var. obtusa Forest [CEGL006046]; Quercus rubra - Acer saccharum - (Q. alba) Forest Alliance – Quercus rubra - Acer saccharum / Viburnum acerifolium - Corylus cornuta Forest [CEGL006173]; Quercus rubra - Betula alleghaniensis / Osmunda cinnamomea Forest – Quercus rubra - Betula alleghaniensis / Osmunda cinnamomea Forest [CEGL006000]; Tsuga canadensis - Betula alleghaniensis Forest Alliance - (associations under review) - Tsuga canadensis - Betula alleghaniensis Lower New England Northern Piedmont Forest [CEGL006109]; AND Tsuga canadensis - Fagus grandifolia forest [CEGL006088].

MA (old name): Part of: CNE MESIC HARDWOOD FOREST ON ACIDIC BEDROCK/TILL.

ME: Mixed hardwood - conifer forest community.

NH: Mesic Appalachian oak-sugar maple-beech-hemlock forest AND Sugar maple - beech - red oak till variant of semi rich mesic forests.

VT: Mesic Red Oak - Hardwood Forest.

NY: Included in: Appalachian oak-hickory forest.

CT: Quercus rubra / Viburnum acerifolium Forest; Quercus rubra - Betula alleghaniensis / Osmunda cinnamomea Forest.

RI: included in Beech - Maple Forest.

Weatherbee: Included in: Mesic Northern Hardwood Forest Community

Author: P. Swain **Date:** 9/1/99

Community Name: **RICH, MESIC FOREST COMMUNITY**
 Community Code: CT1C2A0000
 SRANK: S3
 Tracked: Yes



- Concept:** A variant of the northern hardwood forest where sugar maple is usually dominant and there is a diverse herbaceous layer with abundant spring ephemerals in a moist, nutrient rich environment.
- Environmental Setting:** Rich, mesic forests are usually found on slopes or talus below calcareous bedrock or on level areas where calcareous or circumneutral bedrock is near the surface [areas of enrichment can also occur where bedrock or till are not particularly base rich, but near the location where downslope enrichment takes place]. In Massachusetts, they are restricted to low to moderate elevations below 2,400 ft. (*about 650 m*), and usually on north or east-facing, concave, middle to lower slopes that experience downslope movement of nutrients and organic matter. Rich refers to rich in nutrients, although they are also rich in species; and mesic is the moderate moisture regime. Soils are usually deep, with rapid decomposition of leaves and other plant litter quickly incorporated into the soil, so that there is rarely more than one year's accumulation of leaves on the forest floor.
- Vegetation Description:** Rich mesic forests are dominated by sugar maple (*Acer saccharum*), with white ash (*Fraxinus americana*), bitternut hickory (*Carya cordiformis*), elm species (*Ulmus* spp.), and basswood (*Tilia americana*) being other characteristic trees. Butternut (*Juglans cinerea*) usually grows in rich mesic forests but is infrequent. Hophornbeam (*Ostrya americana*) is common as a subcanopy tree. Although the shrub layer is usually sparse, alternate-leaved dogwood (*Cornus alternifolia*), witch-hazel (*Hamamelis virginiana*), leatherwood (*Dirca palustris*), or red-berried elderberry (*Sambucus racemosa* ssp. *pubens*) might be present. Typically spring ephemerals are abundant. Combinations of any several of the following species usually indicate a rich mesic community: bloodroot (*Sanguinaria canadensis*), maidenhair fern (*Adiantum pedatum*), blue cohosh (*Caulophyllum thalictroides*), sweet cicely (*Osmorhiza claytonii*), Dutchman's breeches (*Dicentra cucullaria*), squirrel corn (*Dicentra canadensis*), toothwort (*Dentaria diphylla*), wild leeks (*Allium tricoccum*), wild ginger (*Asarum canadense*), white baneberry (*Actea pachypoda*), Goldie's fern (*Dryopteris goldiana*), and zigzag goldenrod (*Solidago flexicaulis*) as well as the state-listed species listed below. Two semi-evergreen, fairly distinct sedges (*Carex plantaginea* and *C. platyphylla*) are good indicators of the community that are visible throughout the year.
- Associations:**
- Habitat Values for Associated Fauna:** Most animals of rich, mesic forests are generalized deciduous forest species. Birds that often breed in rich, mesic forests include Wood Thrush (*Hylocichla mustelina*), Veery (*Catharus fuscescens*), Black-and-white Warbler (*Mniotilta varia*), Ovenbird (*Seiurus aurocapillus*), Louisiana Woodthrush (*S. motacilla*), Scarlet Tanager (*Piranga rubra*), and Barred Owls (*Strix varia*). Vernal pools in these forests may be breeding sites for blue spotted salamanders (*Ambystoma jeffersonianum*) and other mole salamanders (*Ambystoma* spp.), and spotted turtles (*Clemmys guttata*). Most small mammals of forests

occur in rich mesic forests, including Southern flying squirrels (*Glaucomys volans*), grey squirrels (*Sciurus carolinensis*), woodland jumping mouse (*Napaeozapus insignis*), masked shrew (*Sorex cinereus*), and red-backed vole (*Clethrionomys gapperi*). Larger mammals include rich mesic forests as parts of their habitat.

Associated Rare Plants:

ACER NIGRUM	BLACK MAPLE	SC
APLECTRUM HYEMALE	PUTTY-ROOT	E
CIMICIFUGA RACEMOSA	BLACK COHOSH	E
CORALLORRHIZA ODONTORHIZA	AUTUMN CORALROOT	SC
DIPLAZIUM PYCNOCARPON	GLADE FERN	- WL
MILIUM EFFUSUM	WOODLAND MILLET	T
RIBES LACUSTRE	BRISTLY BLACK CURRANT	SC
SANICULA CANADENSIS	CANADIAN SANICLE	T
SANICULA ODORATA	LONG-STYLED SANICLE	T

Associated Rare Animals:

AMBYSTOMA JEFFERSONIANUM	JEFFERSON SALAMANDER	SC
AMBYSTOMA MACULATUM	SPOTTED SALAMANDER	- WL
CLEMMYS GUTTATA	SPOTTED TURTLE	SC
CLEMMYS INSCULPTA	WOOD TURTLE	SC
ELAPHE OBSOLETA	BLACK RAT SNAKE	E
HEMIDACTYLUM SCUTATUM	FOUR-TOED SALAMANDER	SC
PIERIS NAPI OLERACEA	MUSTARD WHITE	SC

Examples with Public Access: Green River Forest, Greenfield; Maple Hill WMA, West Stockbridge; South Mountain, Pittsfield; Mt. Toby, Sunderland and Leverett; The Hopper - Mt. Greylock State Reservation, Williamstown.

Threats: Invasive exotics do very well in the nutrient rich, mesic conditions associated with these forests. Fragmentation and isolation can be problems for the species of the community.

Management Needs: Control of exotics in exemplary sites.

Inventory Need Rank: 3

Inventory Comments: 1999, student at Harvard Forest working on Connecticut Valley sites.

Synonyms:

USNVC/TNC: Acer saccharum- Fraxinus americana- Tilia americana Forest Alliance – Acer saccharum- Fraxinus americana- Juglans cinerea/ Staphylea trifolia Forest (Rich talus slope Forest) [CEGL006020]; Acer saccharum- Fraxinus americana- Tilia americana Forest Alliance – Acer saccharum- Fraxinus spp.- Tilia americana/ Osmorhiza claytonii- Caulophyllum thalictroides Forest [CEGL005008].

MA (old name): SNE RICH MESIC FOREST (CIRCUMNEUTRAL TO BASIC).

ME: Cove forest Community.

NH: (*Enriched*) Rich mesic forest; Rich sugar maple- ash- oak- hickory forest.

VT: Mesic Northern Hardwoods.

NY: Maple basswood rich mesic forest.

CT: Acer saccharum- Fraxinus americana/ Tilia americana forests – Acer saccharum - Fraxinus americana / Asarum canadensis community.

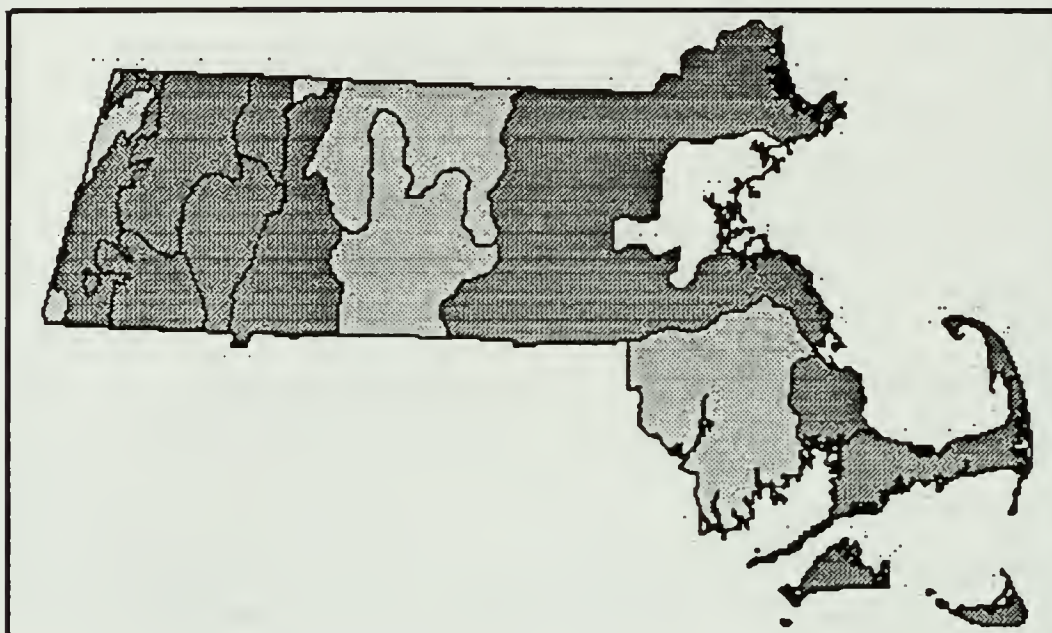
RI: Included in: Beech - Maple Forest.

Weatherbee: Rich mesic forest.

Author: P. Swain

Date: 1/19/00

Community Name: **FOREST SEEP COMMUNITY**
 Community Code: CT1C2B1000
 SRANK: S4
 Tracked: No



- Concept:** Hardwood forests on slopes, with small springs and seeps on mucky soils. Canopy is from or similar to, the surrounding forest, but shrub and herbaceous layers species are typical of wetlands or mesic areas.
- Environmental Setting:** Seeps may be near stream headwaters, or may be isolated with the water absorbed into the surroundings. They occur where the top of the ground water table intersects the surface, and the water emerges.
- Vegetation Description:** Canopy is usually northern hardwood species such as sugar maple (*Acer saccharum*), white ash (*Fraxinus americana*), red maple (*Acer rubrum*), yellow birch (*Betula alleghaniensis*), and white birch (*B. papyrifera*). Other sites have hemlock (*Tsuga canadensis*) spruce (*Picea rubens*), and scattered white pines (*Pinus strobus*) among the hardwoods. Ferns are typical: cinnamon fern (*Osmunda cinnamomea*), ostrich fern (*Matteuccia struthiopteris*), silvery spleenwort (*Deparia acrostichoides*), rattlesnake fern (*Botrychium virginianum*), and Christmas fern (*Polystichum acrostichoides*). Golden saxifrage (*Chrysplenium americanum*) primarily occurs in seeps. Scouring rush (*Equisetum hyemale*), false hellebore (*Veratrum viride*), water avens (*Geum rivale*), an assortment of sedges are among the other plants found at seeps.
- Associations:** Presented as distinct from palustrine seeps, but may be just a small version.
- Habitat Values for Associated Fauna:** These small communities provide parts of the habitats of the species of surrounding communities. Most tree dwelling species would not be affected by the presence of small seeps below. Star-nosed moles (*Condylura cristata*) would be expected in seeps of any kind. If the water from the seeps stays in topographic low areas those may function as vernal pools, and support vernal pool breeding species. Where even small amounts of sphagnum moss build up, four-toed salamanders (*Hemidactylium scutatum*) may be found, and in larger patches, Southern bog lemmings (*Synaptomys cooperi*) may be present.

Associated Rare Plants:

EQUISETUM SCIRPOIDES	DWARF SCOURING-RUSH	SC
PLATANThERA DILATATA	LEAFY WHITE ORCHIS	T
SPHENOPHOLIS PENNSYLVANICA	SWAMP OATS	T
SPIRANTHES ROMANZOFFIANA	HOODED LADIES'-TRESSES	E

Associated Rare Animals:

HEMIDACTYLUM SCUTATUM	FOUR-TOED SALAMANDER	SC
POLYCELIS REMOTA	SUNDERLAND SPRING PLANARIAN	E
SOREX DISPAR	LONG-TAILED SHREW	SC
SYNAPTOMYS COOPERI	SOUTHERN BOG LEMMING	SC

Examples with Public Access: Savoy Mountain State Forest, Savoy, Sunderland Fish Hatchery, Sunderland.

Threats: Exotic species: water-cress (*Rorippa nasturtium-aquaticum*), forget-me-not (*Myosotis scorpioides*), Yellow Iris (*Iris pseudacorus*), and Japanese barberry (*Berberis thunbergii*) can be abundant. Water flow needs to be maintained, large wells can impact small wetlands. Several locations have had natural mud or rock slides.

Management Needs: Exotic removals in sites where practical.

Inventory Need Rank: 2

Inventory Comments: Seems to be widespread in forested areas - but calcareous types support some calcareous species.

Synonyms:

USNVC/TNC:

MA (old name): part of SNE SEEPAGE FOREST

ME: Not described

NH: 1994: Northern Hardwood Seepage Forest

VT: Possibly a small type of Woodland Seep/Spring run community.

NY: Not described

CT: Not described.

RI: Not described.

Weatherbee: Calcareous variant is part of Calcareous Seep Community.

Author: P. Swain

Date: 8/4/99

Community Name: CALCAREOUS FOREST SEEP COMMUNITY
Community Code: CT1C2B2000
SRANK: S2
Tracked: Yes



- Concept:** Within hardwood forests on slopes, with small springs and seeps containing water with dissolved calcium emerge from the ground where the surface intersects the top of the water table. Canopy is of the surrounding forest although more open, but shrub and herbaceous layers species are typical of calcareous wetlands. Usually very small, much less than an acre in size. The community as defined is close to a Calcareous Sloping Fen.
- Environmental Setting:** Seeps may be near stream headwaters, or may be isolated with the spring water spilling out to be absorbed into the surroundings. Calcareous forested seeps receive water that has flowed through or been in contact with limestone or other calcareous rock or gravel. Sites in the Berkshire highlands and Vermont Piedmont tend to have fewer of the rarer calcareous fen species that are thought to be restricted to the richest sites.
- Vegetation Description:** Calcareous seeps typically occur within rich northern hardwoods and share the tree canopy species of the surrounding forest such as sugar maple (*Acer saccharum*), white ash (*Fraxinus americana*), beech (*Fagus grandifolia*), black birch (*Betula lenta*), and red oak (*Quercus rubra*), although white pine (*Pinus strobus*) and hickories (*Carya* spp.) are also reported. The canopy is usually more open than in the surrounding forest. Black ash, typical of wet calcareous communities, also occurs in calcareous forested seep communities. witch-hazel (*Hamamelis virginiana*), ironwood (*Carpinus caroliniana*), alternate-leaved dogwood (*Cornus alternifolia*), striped maple (*Acer pensylvanicum*), and young of the canopy species contribute to a scattered shrub layer. The herbaceous layer varies from sparse to continuous and includes many widespread wetland species such as sensitive fern (*Onoclea sensibilis*), yellow jewelweed (*Impatiens pallida*), and jack-in-the-pulpit (*Arisaema triphyllum*). Key indicator calcareous species include many calcareous fen indicators as well: shrubby cinquefoil (*Pentaphylloides floribunda*), alder-leaf buckthorn (*Rhamnus alnifolia*), wild black currant (*Ribes americanum*), yellow sedge (*Carex flava*), porcupine sedge (*Carex hystericina*), hoary willow (*Salix candida*), autumn willow (*S. serissima*), purple avens (*Geum rivale*), rough-leaved goldenrod (*Solidago patula*), and grass-of-parnassus (*Parnassia glauca*).
- Associations:**
- Habitat Values for Associated Fauna:** As with other seeps, these small communities provide parts of the habitats of the species of surrounding communities. Most tree dwelling species would not be affected by the presence of small seeps below. Star-nosed moles (*Condylura cristata*) would be expected in seeps of any kind. If the water from the seeps stays in topographic low areas those may function as vernal pools, and support vernal pool breeding species.

Associated Rare Plants:

CYPRIPEDIUM REGINAE	SHOWY LADY'S-SLIPPER	SC
EQUISETUM SCIRPOIDES	DWARF SCOURING-RUSH	SC
PLATANThERA DILATATA	LEAFY WHITE ORCHIS	T
SPIRANTHES ROMANZOFFIANA	HOODED LADIES'-TRESSES	E

Associated Rare Animals:

NONE KNOWN

Examples with Public Access: Mt. Greylock State Reservation, Williamstown.

Threats: Exotics, which are particularly invasive in calcareous conditions. Morrow's Honeysuckle (*Lonicera morrowii*), barberry (*Berberis vulgaris*), common buckthorn (*Rhamnus cathartica*), and black swallow-wort (*Cynanchum louisae*) are typical invaders of the community. Water sources need to be maintained.

Management Needs: Removal of exotics.

Inventory Need Rank: 2

Inventory Comments: Included in Motzkin's Connecticut Valley study. Difference from Calcareous Sloping Fen need to be defined.

Synonyms:

USNVC/TNC: Within occurrences of *Acer saccharum* - *Betula alleghaniensis* - (*Fagus grandifolia*) Forest Alliance and *Acer saccharum* - *Fraxinus americana* - *Tilia americana* Forest Alliance.

MA (old name): Part of SNE SEEPAGE FOREST

ME: Not described.

NH: Not described.

VT: Possibly a small type of Woodland Seep/Spring run community.

NY: Not described.

CT: Not described.

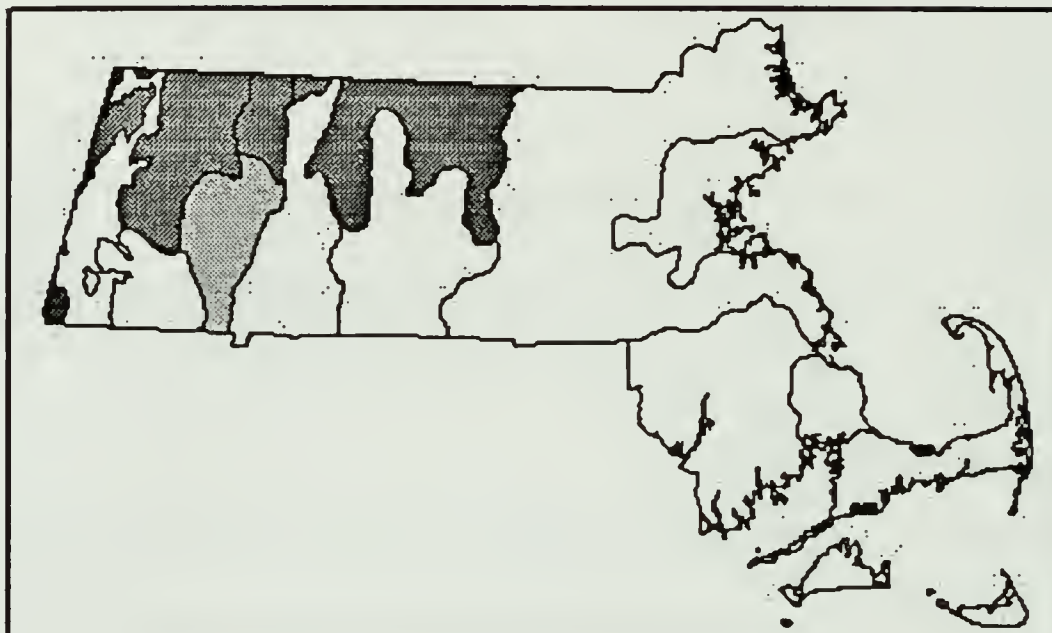
RI: Not described.

Weatherbee: part of Calcareous Seep Community

Author: P. Swain

Date: 10/21/99

Community Name: SPRUCE - FIR - NORTHERN HARDWOODS FOREST
 Community Code: CT1D100000
 SRANK: S4
 Tracked: No



Concept: A northern and higher elevation mixed red spruce - northern hardwood forest.

Environmental Setting: Tends to be in cool, and typically rocky soils, nutrient poor, somewhat dry, and acidic. Grades into northern hardwoods - hemlock - white pine forests on moister, warmer slopes.

Vegetation Description: A community of variable dominance: red spruce may be dominant, or co-dominant with sugar maple and beech (or these may be dominant), with abundant yellow birch and smaller amounts of red spruce and/ or balsam fir. Hemlock (*Tsuga canadensis*) can be abundant or scattered. Heart-leaf paper birch (*Betula cordifolia*) and paper birch (*Betula papyrifera*) usually occur as scattered individuals. Characteristic shrubs include mountain maple (*Acer spicatum*), red-berried elder (*Sambucus racemosa* var. *pubens*), northern mountain ash (*Sorbus americana*), and hobblebush (*Viburnum lantanoides*). A low shrub layer has bunchberry (*Cornus canadensis*), creeping snowberry (*Gaultheria hispidula*), and occasionally, twinflower (*Linnaea borealis*). The herbaceous layer tends to be sparse, especially when spruce is abundant; plants include intermediate fern (*Dryopteris intermedia*), mountain wood fern (*Dryopteris campyloptera*), blue-bead lily (*Clintonia borealis*), painted trillium (*Trillium undulatum*), and wood sorrel (*Oxalis acetosella*).

Associations:

Habitat Values for Associated Fauna: Animals of this community tend to be northern species that are more typical of forests of Vermont and New Hampshire. Birds include Golden-crowned Kinglet (*Regulus satrapa*), Blue-headed Vireo (*Vireo solitarius*), and species of big warblers including Blackburnian (*Dendroica fusca*), Yellow-rumped (*D. dominica*), and Magnolia Warbler (*D. Magnolia*). Mammals include fisher (*Martes pennanti*), as a classic example, and northern species such as red squirrels (*Tamiasciurus hudsonicus*), snowshoe hare (*Lepus americanus*), in the open areas, northern flying squirrels (*Glaucomys sabrinus*), and Pygmy shrews (*Sorex hoyi*). Amphibians would include the ubiquitous redbacked salamanders (*Plethodon cinereus*), wood frogs (*Rana sylvatica*), and red efts, the juvenile stage of red-spotted newt (*Notophthalmus v. viridescens*).

Associated Rare Plants:

AMELANCHIER BARTRAMIANA	BARTRAM'S SHADBUSH	T
DRYOPTERIS CAMPYLOPTERA	MOUNTAIN WOOD-FERN	- WL
HUPERZIA APPALACHIANA	APPALACHIAN CLUBMOSS	E
HUPERZIA SELAGO	MOUNTAIN FIRMOSS	E

LINNAEA BOREALIS	TWINFLOWER	- WL
MILIUM EFFUSUM	WOODLAND MILLET	T
RIBES TRISTE	SWAMP RED CURRANT	- WL
SORBUS DECORA	NORTHERN MOUNTAIN-ASH	E
STREPTOPUS AMPLEXIFOLIUS VAR AMERICANUS	WHITE MANDARIN	- WL

Associated Rare Animals:

NONE KNOWN

Examples with Mohawk Trail State Forest, Charlemont; Savoy State Forest, Savoy; Monroe State Forest,

Public Access: Monroe; Mt. Greylock State Reservation, Lanesboro.

Threats:

Management Needs:

Inventory Need Rank: 3

Inventory Comments: Old Growth examples are priority sites.

Synonyms:

USNVC/TNC: Picea rubens - Abies balsamea Forest Alliance -- Abies balsamea- (Betula papyrifera var. cordifolia) Forest [CEGL006112]; Picea rubens - Betula alleghaniensis Forest Alliance -- Picea rubens - Betula alleghaniensis / Clintonia borealis Forest [ECGL006267]; Acer saccharum - Betula alleghaniensis - (Fagus grandifolia) Forest Alliance -- Acer saccharum - Betula alleghaniensis - Fagus grandifolia / Viburnum lantanoides Forest [CEGL006252]; Tsuga canadensis - Betula alleghaniensis Forest Alliance -- Tsuga canadensis - Betula alleghaniensis - Picea rubens / Cornus canadensis Forest [CEGL006129]; Pinus strobus - Tsuga canadensis forest Alliance -- Pinus strobus - Tsuga canadensis - Picea rubens Forest [CEGL006324]

MA (old name): CNE MESIC CONIFER FOREST ON ACIDIC BEDROCK/TILL and CNE DRY CONIFER FOREST ON ACIDIC BEDROCK OR TILL [CT2G1A2000].

ME: Pine - Hemlock / Spruce Forest Community, Spruce slope forest community AND parts of Northern hardwood forest community.

NH: 1997 - Sugar maple - beech - red spruce forest; AND Northern hardwood - spruce - fir - forest (Acer saccharum - Fagus - Betula alleghaniensis - Picea rubens - Abies forest) 1994 - Sugar maple - beech - red spruce forest.

VT: Montane Spruce- Fir forest.

NY: Spruce - Northern hardwood forest.

CT: Not applicable.

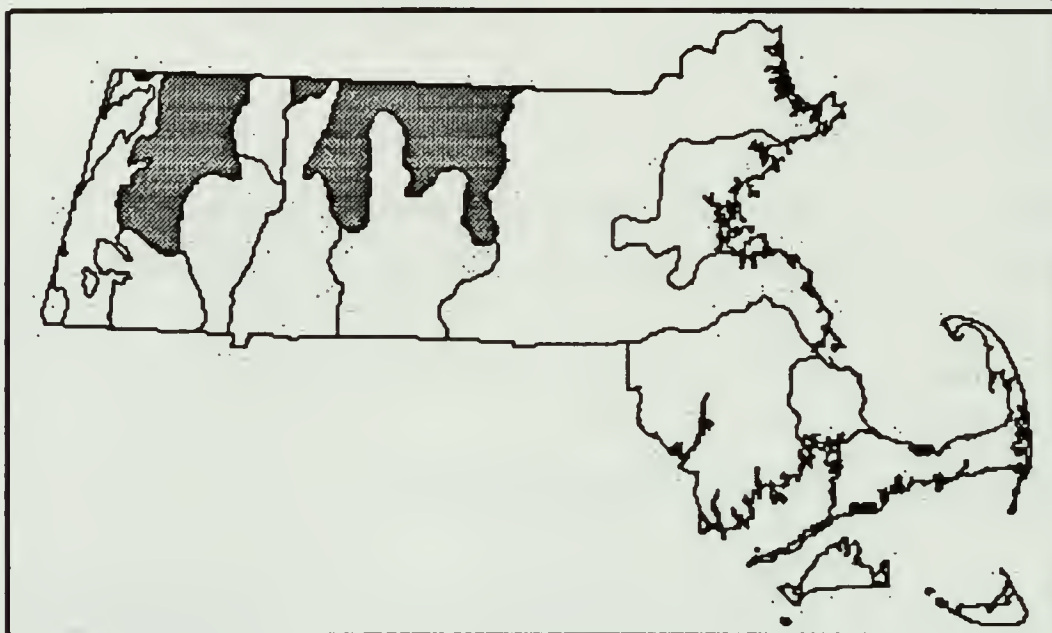
RI: Not applicable.

Weatherbee: Mesic northern conifer forest

Author: P. Swain

Date: 8/5/99

Community Name: **HIGH ELEVATION SPRUCE - FIR FOREST / WOODLAND**
Community Code: CT1D300000
SRANK: S2
Tracked: Yes



Concept: Dwarfed trees from wind on the tops of the tallest, most exposed mountains in Massachusetts. Conifers, balsam fir and red spruce, dominate, and often form dense thickets.

Environmental Setting: Often stunted trees from wind exposure, occurring at the highest, most exposed areas. Down slope it grades into taller, more diverse spruce - fir - northern hardwood forests.

Vegetation Description: A low diversity coniferous forest of high elevations, usually on steep stony, upper slopes or level ridgetops. Balsam fir (*Abies balsamea*) is dominant, associated with red spruce (*Picea rubens*). Paper birch, heart-leaf paper birch (*Betula papyrifera* and *B. cordifolia*), and yellow birch (*B. alleghaniensis*) occur in lower numbers. Where there is light, shrubs such as mountain maple (*Acer spicatum*), mountain holly (*Nemopanthus mucronata*), American mountain ash (*Sorbus americana*), and hobblebush (*Viburnum lantanoides*) may grow. Blue-bead lily (*Clintonia borealis*), mountain wood-sorrel (*Oxalis montana*), bunchberry (*Cornus canadensis*), and bristly clubmoss (*Lycopodium annotinum*) grow scattered on mosses or a thick layer of needles.

Associations:

Habitat Values for Associated Fauna: The tops of Massachusetts's highest, most exposed mountains provides habitat for some northern animals such as Swainson's Thrush (*Catharus ustulatus*) and pygmy shrew (*Sorex hoyi*), as well as the state-protected species listed below. Also expected would be more widespread species that use conifer forests, such as snowshoe hare (*Lepus americanus*), porcupine (*Erethizon dorsatum*), northern flying squirrel (*Glaucomys sabrinus*), deer mouse (*Peromyscus maniculatus*), and birds such as Olive-sided Flycatcher (*Contopus cooperi*) and Rusty Blackbird (*Euphagus carolinus*).

Associated Rare Plants:

AMELANCHIER BARTRAMIANA	BARTRAM'S SHADBUSH	T
BETULA CORDIFOLIA	HEART-LEAF PAPER BIRCH	- WL
LUZULA PARVIFLORA SSP MELANOCARPA	BLACK-FRUITED WOODRUSH	E
SORBUS DECORA	NORTHERN MOUNTAIN-ASH	E

Associated Rare Animals:

DENDROICA STRIATA	BLACKPOLL WARBLER	SC
SOREX DISPAR	LONG-TAILED SHREW	SC

Examples with Public Access: Mt. Greylock State Reservation, Lanesboro; much poorer community examples occur at Mt. Wachusett, Princeton; and Mt. Watatic, Ashburnham

Threats: Development of the summit, clearing for parking, trails, ski lift facilities, or communications towers.

Management Needs:

Inventory Need Rank: 3

Inventory Comments: Much more common in states to the north and with higher mountains.

Synonyms:

USNVC/TNC: *Picea rubens* - *Abies balsamea* Forest Alliance – *Abies balsamea*- (*Betula papyrifera* var. *cordifolia*) Forest [CEGL006112]; *Picea rubens* - *Abies balsamea* Forest Alliance – *Picea rubens*- *Abies balsamea*- *Sorbus americana* Forest [CEGL006128]; *Picea rubens* Woodland Alliance – *Picea rubens*/*Vaccinium angustifolium* - *Sibbaldiopsis tridentata* Woodland [CEGL006053].

MA (old name): NEW ENGLAND HIGH ELEVATION SPRUCE/FIR FOREST.

ME: Subalpine spruce- fir forest community; Spruce slope forest; Spruce woodland.

NH: 1997 - High-elevation spruce-fir forest; 1994 - Subalpine and alpine Community Complexes Mountain Spruce-fir formation..

VT: Montane spruce-fir Forest, but with parts of High-elevation spruce-fir forest and subalpine heath/krummolz community.

NY: Mountain spruce-fir forest.

CT: Not applicable.

RI: Not applicable.

Weatherbee: Part of Mesic Northern Conifer Forest Community.

Author: P. Swain **Date:** 1/11/00

DRAFT

**Descriptions of
Palustrine Communities**

DRAFT

**Classification of the
Natural Communities
of
Massachusetts**

The palustrine section of the Massachusetts' natural community classification includes all freshwater, non-tidal wetlands dominated by trees, shrubs, persistent emergents, emergent mosses, or lichens. This definition is slightly different from Cowardin (1979) who also included small, shallow aquatic beds with submersed and floating-leaved aquatics, and tidal wetlands where salinity due to ocean-derived salts was less than 0.5%. In the Massachusetts' classification, submersed and floating leaved aquatics are included in the lacustrine section, and all tidal wetlands are included in the estuarine section. The palustrine section does include riverside communities that receive annual or semi-annual overbank flooding, e.g. floodplain forests. High-terrace floodplain forests (although technically terrestrial communities) are included in the palustrine section in order to group them with other floodplain forest communities.

The organization of the palustrine classification is given in the palustrine table of contents, which follows. A primary division is made between forested (>50% tree canopy cover) and non-forested wetlands. Within the forested section, a second division is made between conifer-dominated (conifers providing >50% of the total canopy coverage) and hardwood-dominated communities. The forested/non-forested and conifer-/hardwood-dominated divisions are intended to aid the user in identifying community types. It should be recognized, however, that there are continuous gradients in communities from forested to non-forested and from conifer- to hardwood-dominated. The boundaries between these types and between the named communities are not absolute. Communities intergrade and several may occur together within a wetland mosaic.

The organization described above differs from that of the original classification used by Massachusetts (Rawinski 1984) which made a primary division between basin and seepage wetlands. For most of Massachusetts' wetland communities, detailed environmental data (particularly hydrologic data) are lacking making distinctions between basin and seepage wetlands uncertain. Until there are sufficient data to support differences between seepage and basin types, the types are lumped into one name that describes the overall vegetation of the community. For example, the previously used names Southern New England Basin Swamp and Southern New England Seepage Swamp are replaced by Red Maple Swamp for those swamps in which red maple is dominant. Rich and poor variants are described within the vegetation description. However, the names "calcareous seepage swamp" and "calcareous seepage marsh" are retained due to their common usage.

PALUSTRINE COMMUNITIES

FORESTED WETLANDS

Conifer-dominated:

Spruce-fir boreal swamp	P - 2
Hemlock-hardwood swamp	P - 4
Atlantic white cedar swamps	
j. Coastal Atlantic white cedar swamp	P - 6
vi. Inland Atlantic white cedar swamp	P - 8
vii. Northern Atlantic white cedar swamp	P - 10
viii. Alluvial Atlantic white cedar swamp	P - 12
Atlantic white cedar bog	P - 14
Spruce-tamarack bog	P - 16

Hardwood-dominated:

Red maple swamp	P - 18
i. Alluvial red maple swamp	P - 20
Black ash swamp	P - 22
Black ash-red maple-tamarack calcareous seepage swamp	P - 24
Black gum-pin oak-swamp white oak "perched" swamp	P - 26
Black gum swamp	P - 28
Floodplain forests	
vi. Major-river floodplain forest	P - 30
vii. Transitional floodplain forest	P - 32
viii. Small-river floodplain forest	P - 34
ix. High-terrace floodplain forest	P - 36
x. Cobble bar forest	P - 38

NON-FORESTED WETLANDS

Marshes/Wet meadows:

Coastal interdunal marsh/swale	P - 40
Deep emergent marsh	P - 42
Shallow emergent marsh	P - 44
Wet meadow	P - 46
i. Kettlehole wet meadow	P - 48

Pondshores/lakeshores:

Inland acidic pondshore/lakeshore	P - 50
Coastal plain pondshore	P - 52
Calcareous pondshore/lakeshore	P - 54

Riversides/Streambanks:

Mud flat	P - 56
Riverside seep	P - 58
Low-energy riverbank	P - 60
High-energy riverbank	P - 62
Riverine pointbar and beach	P - 64

Shrub swamps:

Shrub swamp	P - 66
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Peatlands (bogs and fens):

Calcareous peatlands:

Calcareous sloping fen	P - 68
Calcareous seepage marsh	P - 70
Calcareous basin fen	P - 72

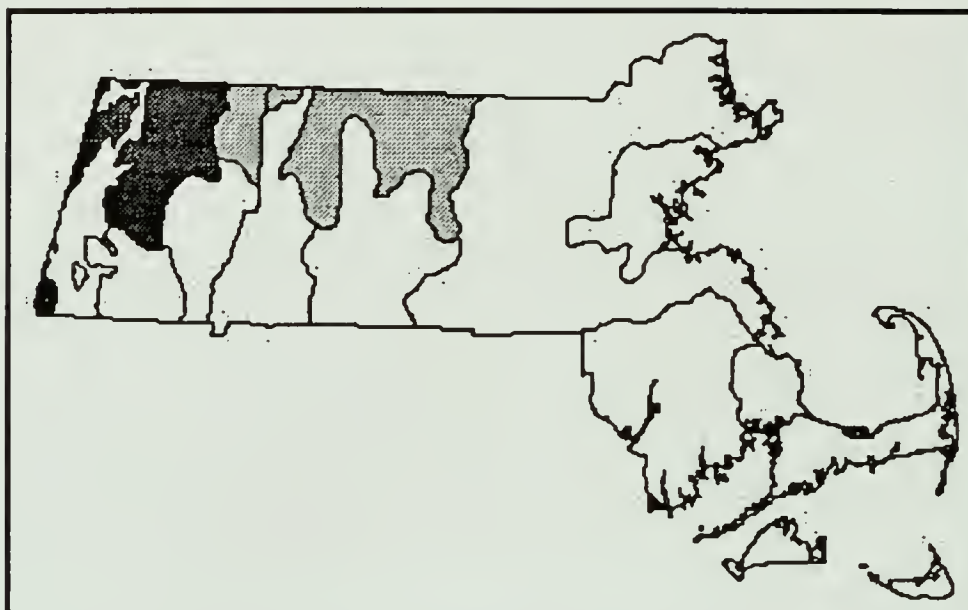
Acidic peatlands:

Acidic graminoid fen	P - 74
Acidic shrub fen	P - 76
Sea-level fen	P - 78
Level bog	P - 80
iii. Kettlehole level bog	P - 82
iv. Highbush blueberry thicket	P - 84

Vernal pools:

Woodland vernal pool	P - 86
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Community Name: **SPRUCE-FIR BOREAL SWAMP**
Community ELCODE: CP1A110000
SRANK: S3
Tracked: Yes



Concept: Forested wetlands of western and north-central Massachusetts dominated by red spruce and balsam fir.

Environmental setting: Spruce-fir swamps are typically found at stream headwaters or in poorly drained basins in the mountainous, northwestern part of the state. They develop in cold, poorly drained areas, typically on acidic glacial till. Elevation ranges from 1500-2000 ft. in the Berkshire Highlands [Weatherbee 1996]. Peat accumulation appears to be minimal at most known sites. More work is needed to describe the physical setting and soil profiles of boreal swamps.

Vegetation Description: Red spruce (*Picea rubens*) and balsam fir (*Abies balsamea*) are dominant in the overstory. Other canopy associates are white pine (*Pinus strobus*), black cherry (*Prunus serotina*), tamarack (*Larix laricina*), black spruce (*Picea mariana*), paper birch (*Betula papyrifera*), hemlock (*Tsuga canadensis*), yellow birch (*Betula alleghaniensis*), and red maple (*Acer rubrum*). Unlike spruce-tamarack forested bogs, spruce-fir boreal swamps have red spruce rather than black spruce co-dominant in the canopy, and they typically lack bog indicator species like Labrador tea (*Ledum groenlandicum*) and bog laurel (*Kalmia polifolia*). The following three shrubs almost always occur in boreal swamps: mountain holly (*Nemopanthus mucronatus*), sheep laurel (*Kalmia angustifolia*), and wild raisin (*Viburnum nudum* var. *cassinoides*). Other shrubs include American mountain-ash (*Sorbus americana*), hobble-bush (*Viburnum lantanoides*), and mountain maple (*Acer spicatum*). Typical herbaceous species are northern awned sedge (*Carex gynandra*), New England sedge (*Carex novae-angliae*), goldthread (*Coptis trifolia* ssp. *groenlandica*), creeping snowberry (*Gaultheria hispidula*), bluebead-lily (*Clintonia borealis*), one-sided pyrola (*Orthilia secunda*), bishop's cap (*Mitella diphylla*), lesser mitrewort (*Mitella nuda*), mountain wood-sorrel (*Oxalis montana*), royal fern (*Osmunda regalis*), and pale St. John's-wort (*Hypericum ellipticum*). The ground is often a carpet of mosses; more information is needed on the characteristic moss species. Richer variants of the community can occur in areas of calcareous groundwater seepage, but more information is needed.

Associations: No associations have been described in Massachusetts.

Habitat values for Associated Fauna: Spruce-fir boreal swamps can function as vernal pool habitat if water remains standing for 2-3 months and they lack fish; these areas provide important amphibian breeding habitat.

Associated rare plants:

AMELANCHIER BARTRAMIANA	BARTRAM'S SHADBUSH	T
ARCEUTHOBIUM PUSILLUM	DWARF MISTLETOE	SC
RIBES TRISTE	SWAMP RED CURRANT	- WL

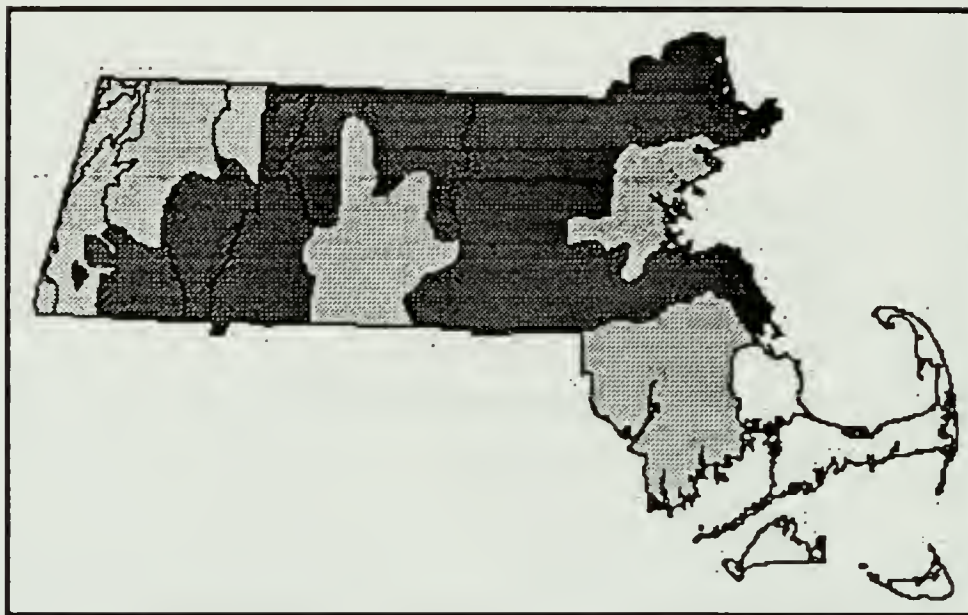
Associated rare animals:

PIERIS NAPI OLERACEA	MUSTARD WHITE	SC
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Examples: several spruce-fir swamps bordering Peru WMA, Peru.
Threats: More information is needed to identify the threats to boreal swamps.
Management needs: More information is needed to assess the management needs for boreal swamps.
Inventory need rank: 1
Inventory comments:
Synonyms:
USNVC/TNC: *Picea mariana*/*Kalmia angustifolia*/*Sphagnum* spp. Forest [CEGL006168]; *Picea rubens*-*Abies balsamea*/*Gaultheria hispidula*/*Sphagnum* spp. spruce swamp of northern Appalachians [CEGL006312]; *Picea rubens*-*Abies balsamea*/*Sphagnum magellanicum* forest [CEGL006311]; calcareous variants correspond to *Fraxinus nigra*-*Acer rubrum*/*Nemopanthus mucronata*-*Vaccinium corymbosum* forest [CEGL006220].
MA [old name]: NNE Acidic Seepage Swamp [CP3B2B0000].
ME: Spruce-fir swamp community.
VT: Spruce-fir-tamarack swamp.
NH: Coniferous basin swamp.
NY: Spruce-fir swamp.
CT: *Picea rubens*/*Nemopanthus mucronata* community.
RI: not described.
Golet & Larson, 1974: Evergreen wooded swamp [WS-2].
Other: Acidic conifer swamp community [Weatherbee 1996].
Author: J. Kearsley **Date:** 7/21/99

Community Name:
Community ELCODE:
SRANK:
Tracked:

HEMLOCK-HARDWOOD SWAMP
CP1A120000
S4
No



- Concept:** Acidic forested swamps where hemlock is dominant or co-dominant in the canopy.
- Environmental setting:** Hemlock-hardwood swamps occur in poorly drained basins in bedrock and till throughout the central and western portions of the state. The soil is muck and it is saturated throughout the year. Some groundwater seepage appears to be typical. At sites where mixed hemlock swamp and red maple swamp occur [1000 Acre Swamp in Athol and Phillipston], hemlock-dominated areas appear to occupy higher elevations. More information is needed to characterize the environmental setting and physical characteristics of hemlock-hardwood swamp forests.
- Vegetation Description:** Many swamps have hemlock (*Tsuga canadensis*) as a component of the canopy but "hemlock-hardwood swamps" are differentiated from others by having hemlock as the major canopy species. In some cases, hemlock forms dense stands. In other cases, probably more commonly, hemlock is associated with a mixture of white pine (*Pinus strobus*), red maple (*Acer rubrum*), and yellow birch (*Betula alleghaniensis*). The hemlock-dominated canopy allows little light into the subcanopy and shrub species are sparse, but shrubs can form dense thickets in canopy gaps. Typical shrubs include alders (*Alnus* spp.), highbush blueberry (*Vaccinium corymbosum*), winterberry (*Ilex verticillata*), and mountain holly (*Nemopanthes mucronatus*). The ground layer is hummocky and covered in various moss species. Ferns are common, especially cinnamon fern (*Osmunda cinnamomea*). Sensitive fern (*Onoclea sensibilis*) also occurs. Goldthread (*Coptis trifolia* ssp. *groenlandica*) is characteristic. In areas where hemlock is mixed with hardwoods, there appears to be higher species diversity. Woodferns—including spinulose woodfern (*Dryopteris carthusiana*), intermediate woodfern (*D. intermedia*), and crested woodfern (*D. cristata*)—can be abundant in the herbaceous layer. Rich variants of hemlock-hardwood swamps occur. One rich site located at the base of a steep forested slope in Huntington has a mixture of spice bush (*Lindera benzoin*), mountain-laurel (*Kalmia latifolia*), and hobble-bush (*Viburnum lantanoides*) in the shrub layer, and an herbaceous layer of more than 20 species, including jack-in-the-pulpit (*Arisaema triphyllum*), spotted touch-me-not (*Impatiens capensis*), Pennsylvania bittercress (*Cardamine pennsylvanica*), cinnamon fern (*Osmunda cinnamomea*), interrupted fern (*Osmunda claytoniana*), goldthread (*Coptis trifolia* ssp. *groenlandica*), and blue marsh-violet (*Viola cucullata*). Rich hemlock-hardwood swamps are differentiated from calcareous seepage swamps by their lower herbaceous species richness, about 20 species as compared to >40 for calcareous seepage swamps, and their lack of characteristic calciphiles, such as delicate sedge (*Carex leptalea*), brome-like sedge (*Carex bromoides*), long-stalked sedge (*Carex pedunculata*), rough-leaved goldenrod (*Solidago patula*), and golden ragwort (*Senecio aureus*).
- Associations:** No associations have been described in Massachusetts.
- Habitat values for Associated Fauna:** Hemlock-hardwood swamps can function as vernal pool habitat if water remains standing for 2-3 months and they lack fish; these areas provide important amphibian breeding habitat.

Associated rare plants:

MALAXIS BRACHYPODA	WHITE ADDER'S-MOUTH	T
RIBES TRISTE	SWAMP RED CURRANT	- WL

Associated rare animals:

AMBYSTOMA JEFFERSONIANUM	JEFFERSON SALAMAND ER	SC
AMBYSTOMA LATERALE	BLUE-SPOTTED SALAMAND ER	SC
CLEMMYS GUTTATA	SPOTTED TURTLE	SC
CLEMMYS INSCULPTA	WOOD TURTLE	SC
HEMIDACTYLUM SCUTATUM	FOUR-TOED SALAMAND ER	SC

Examples: Bear Swamp, DEM Representative Natural Areas, Beartown SF, Great Barrington; 1000 Acre Swamp, Athol/Phillipston ; Knightville Dam property, ACOE, Huntington/Chester.

Threats: More information is needed to determine the threats to hemlock-hardwood swamps.

Management needs: More information is needed to assess the management needs for hemlock-hardwood swamps.

Inventory need rank: 2

Inventory comments:**Synonyms:**

USNVC/TNC: Tsuga canadensis/Sphagnum spp. forest [CEGL006226]

MA [old name]: not described, included within Northern New England basin swamp [CP2B2B0000]

ME: not described

VT: Hemlock swamp

NH: Hardwood-conifer seepage swamp-Tsuga canadensis/Taxus canadensis association

NY: Hemlock-hardwood swamp; Rich hemlock-hardwood peat swamp

CT: Tsuga canadensis seasonally flooded forest

RI: Hemlock-hardwood swamp

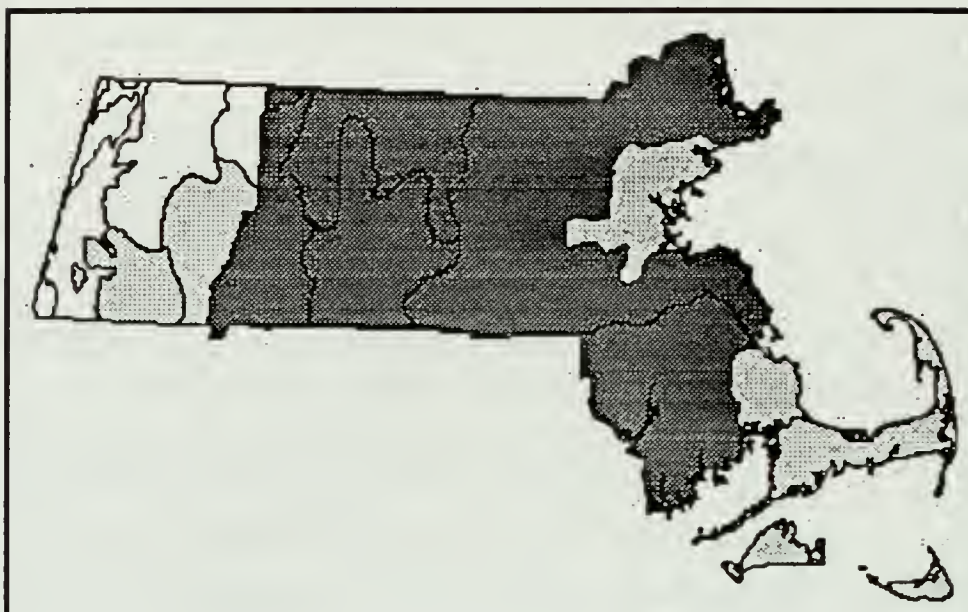
Golet & Larson, 1974: Evergreen wooded swamp [WS-2]

Other:

Author: J. Kearsley **Date:** 7/21/99

Community Name:
Community ELCODE:
SRANK:
Tracked:

COASTAL ATLANTIC WHITE CEDAR SWAMP
CP1B1A1000
S2
Yes



- Concept:** Basin swamps dominated by Atlantic white cedar (*AWC*) in the overstory and a mixture of coastal species in the understory.
- Environmental setting:** Coastal AWC swamps typically occur at low elevations, less than 40 ft. above sea level, in basins overlying sand and gravel deposits or glacial lake bottom sediments. They are limited to coastal regions of the state. Water-saturated peat overlies the mineral sediments, and standing water generally occurs for half of the growing season or longer. The water and soil are nutrient-poor, and particularly low in nitrogen and phosphorus. There is a high iron content in the soil; the iron, called "bog iron," was mined in the early days of manufacturing. Soil pH is acidic, 3.1-5.5, and leaf litter decomposition is slow.
- Vegetation Description:** Atlantic white-cedar (*Chamaecyparis thyoides*) is the dominant tree mixed with red maple (*Acer rubrum*). Pitch pine (*Pinus rigida*), white pine (*Pinus strobus*), and hemlock (*Tsuga canadensis*) are infrequent associates. These swamps can have a very dense shrub layer, including high-bush blueberry (*Vaccinium corymbosum*), swamp azalea (*Rhododendron viscosum*), sweet pepperbush (*Clethra alnifolia*) and fetterbush (*Leucothoe racemosa*). In Cape Cod sites, inkberry (*Ilex glabra*) frequently occurs. The herb layer is sparse and patchy with cinnamon fern (*Osmunda cinnamomea*), Virginia chain fern (*Woodwardia virginica*), starflower (*Trientalis borealis*) and wild sarsaparilla (*Aralia nudicaulis*). The ground layer is dominated by Sphagnum spp. mosses.
- Associations:** Motzkin (1991) described six AWC associations in Massachusetts. Coastal AWC swamps are equivalent to his Coastal AWC Type.
- Habitat values for Associated Fauna:** Young AWC thickets provide excellent cover for deer, rabbits and birds. Atlantic white-cedar foliage and twigs are preferred winter browse for white-tailed deer, while rabbits and mice can feed on cedar seedlings. Although no bird species appear to be restricted to AWC communities, studies have shown these wetlands to be important bird habitat. Birds that have been observed nesting in AWC swamps include Red-breasted Nuthatch, Brown Creeper, Black-and -white Warbler and Black-capped Chickadee. Coastal AWC swamps can function as vernal pool habitat if water remains standing for 2-3 months and they lack fish; these areas provide important amphibian breeding habitat.

Associated rare plants:

LISTERA CORDATA	HEARTLEAF TWAYBLADE	E
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Associated rare animals:

AMBYSTOMA LATERALE	BLUE-SPOTTED SALAMAND ER	SC
CLEMMYS GUTTATA	SPOTTED TURTLE	SC
CRANGONYX ABERRANS	MYSTIC VALLEY AMPHIPOD	SC

HEMIDACTYLUM SCUTATUM	FOUR-TOED SALAMANDER	SC
LITHOPHANE VIRIDIPALLENS	PALE GREEN PINION MOTH	SC
MITOURA HESSELI	HESSEL'S HAIRSTREAK	SC
PARULA AMERICANA	NORTHERN PARULA	T

Examples: Marconi AWC Swamp, Cape Cod National Sea Shore, Wellfleet.

Threats: The two greatest threats to AWC swamps are land clearing for agricultural, commercial and residential development, and interference of normal hydrological functioning as a result of development. Atlantic white-cedar has been cut extensively for posts and shingles for over three centuries. In an extensive statewide vegetation inventory funded by MNHESP in 1990, no uncut stands were found, but several sites contained cedars that were 100-200 years old. Selective cutting is detrimental to the persistence of AWC swamps, because hardwoods, such as red maple, out-compete and replace AWC. Any alterations to the natural hydroperiod of AWC swamps threatens their persistence.

Management needs: Due to the limited distribution of AWC swamps, it is recommended that no clearing or filling of these wetlands be allowed. Atlantic white-cedar will regenerate best following catastrophic disturbance events such as hurricanes and fires. Data suggest that in the absence of disturbance, red maple and shrubs increase in abundance at the expense of Atlantic White-Cedar. Fire suppression negatively threatens the long-term persistence of AWC swamps, and controlled burning practices may be an appropriate restoration tool in many areas. Controlled burning should be accompanied by small-patch clearcuts to be most effective. By clear-cutting small patches, generally 20 m x 20 m, and removing the slash and competing vegetation, pure, even-aged stands of Atlantic White-Cedar are able to regenerate. AWC swamps require a natural cycle of wet and dry periods for their survival and reproduction. Standing water for much of the year is unfavorable for both seed germination and seedling survival, and young seedlings are killed by both drowning and drought. It is recommended that any alterations in water levels be avoided, this includes development and road construction in uplands surrounding AWC swamps which can alter water levels. Where cedar wetlands are associated with river systems, it is important to maintain normal hydrologic regime of the river.

Inventory need rank: 3

Inventory comments: Inventory and vegetation classification completed by Glenn Motzkin in 1990.

Synonyms:

USNVC/TNC: Chamaecyparis thyoides/Ilex verticillata forest [CEGL006189]; Chamaecyparis thyoides/Ilex glabra forest [CEGL006188]

MA [old name]: SNE basin swamp, coastal Atlantic white cedar association [CP2B2A1A00]

ME: Atlantic white cedar swamp community

VT: does not occur

NH: Atlantic white cedar basin swamp

NY: Coastal plain Atlantic white cedar swamp

CT: Chamaecyparis thyoides/Vaccinium corymbosum community

RI: Atlantic white cedar swamp, Chamaecyparis thyoides-Acer rubrum-Betula alleghaniensis variant, Chamaecyparis thyoides/Rhododendron viscosum variant

Golet & Larson, 1974: Evergreen wooded swamp (WS-2)

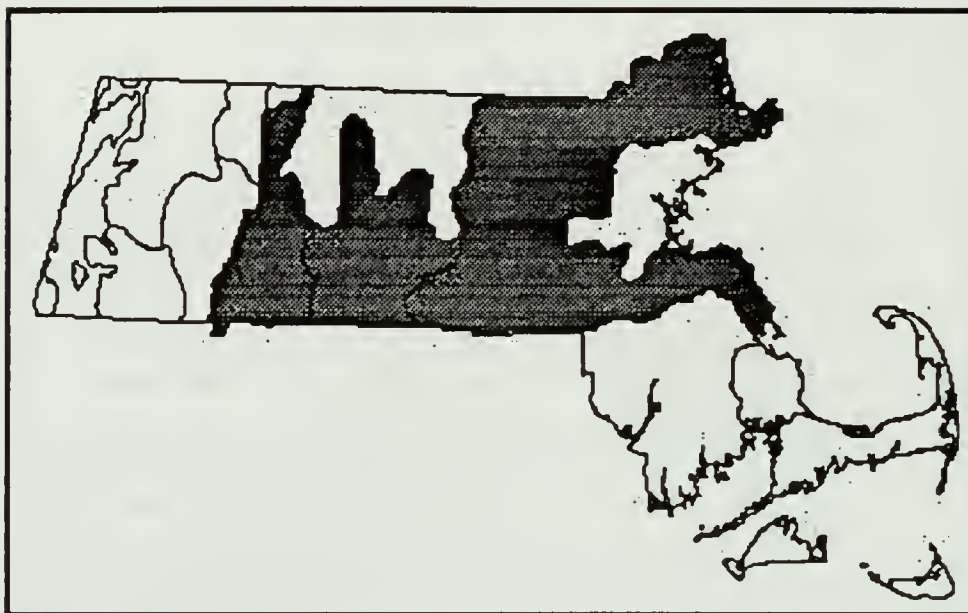
Other:

Author: J. Kearsley

Date: 7/21/99

Community Name:
Community ELCODE:
SRANK:
Tracked:

INLAND ATLANTIC WHITE CEDAR SWAMP
CP1B1A2000
S2
Yes



- Concept:** Inland basin or seepage swamps dominated by Atlantic white cedar in the overstory. Hemlock, spruce, red maple, and yellow birch co-occur, and coastal indicator species are lacking.
- Environmental setting:** Basin or seepage wetlands generally occurring in the central part of the state. Inland AWC swamps are found at a wide range of elevations and may be underlain by sand and gravel, glacial lake sediments, or till deposits. There is typically some surface water movement, and some of the sites receive groundwater seepage from nearby steep till deposits. As in all AWC swamps, water-saturated peat overlies the mineral sediments, and standing water generally occurs for half of the growing season or longer. The water and soil are nutrient-poor, and particularly low in nitrogen and phosphorus. Soil pH is acidic (3.1-5.5) and leaf litter decomposition is slow.
- Vegetation Description:** Canopy trees in Inland AWC swamps differ depending on elevation. In sites lower than 700 ft. elevation, Atlantic White-Cedar (*Chamaecyparis thyoides*) is mixed with hemlock (*Tsuga canadensis*), red maple (*Acer rubrum*), and yellow birch (*Betula alleghaniensis*). At elevations above 700 ft., Atlantic white-cedar is mixed with hemlock and spruce (*Picea* spp.). The low elevation sites typically have sweet pepperbush (*Clethra alnifolia*) and winterberry (*Ilex verticillata*) in the shrub layer, and high elevation sites have abundant mountain holly (*Nemopanthes mucronata*). The herb layer of both low- and higher-elevation sites is similar with cinnamon fern, starflower and Canada mayflower (*Maianthemum canadense*) common. High-elevation sites also have northern species such as creeping snowberry (*Gaultheria hispida*) and bunchberry (*Cornus canadensis*).
- Associations:** Motzkin (1991) described six AWC associations in Massachusetts. Inland AWC swamps include both his mixed hemlock-AWC-red maple-yellow birch type and spruce-hemlock-AWC type.
- Habitat values for Associated Fauna:** Inland AWC swamps can function as vernal pool habitat if water remains standing for 2-3 months and they lack fish; these areas provide important amphibian breeding habitat.

Associated rare plants:

RHODODENDRON MAXIMUM	GREAT LAUREL	T
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Associated rare animals:

AMBYSTOMA JEFFERSONIANUM	JEFFERSON SALAMAND ER	SC
AMBYSTOMA LATERALE	BLUE-SPOTTED SALAMAND ER	SC
CLEMMYS GUTTATA	SPOTTED TURTLE	SC
CRANGONYX ABERRANS	MYSTIC VALLEY AMPHIPOD	SC

SC

SC

Examples: Wilbraham Cedar Swamp, Wilbraham.

Threats: See description under Coastal AWC swamps.

Management needs: See description under Coastal AWC swamps.

Inventory need rank: 3

Inventory comments: Inventory and vegetation classification completed by Glenn Motzkin in 1990.

Synonyms:

USNVC/TNC: Chamaecyparis thyoides-Tsuga canadensis/Lindera benzoin forest [CEGL006089], two of our sites correspond to Chamaecyparis thyoides/Rhododendron maximum forest [CEGL006355].

MA [old name]: SNE acidic seepage swamp, inland Atlantic white cedar association.

ME: not described.

VT: not described.

NH: Atlantic white cedar basin swamp; rich variants correspond to Atlantic white cedar seepage swamp.

NY: Inland Atlantic white cedar swamp.

CT: some of our inland swamps are equivalent to the *Chamaecyparis thyoides*/*Rhododendron maximum* community.

RI: Atlantic white cedar swamp-*Chamaecyparis thyoides*/Rhododendron maximum variant; *Chamaecyparis thyoides*-*Acer rubrum*-*Betula alleghaniensis* variant.

Golet & Larson, 1974: Evergreen wooded swamp (WS-2).

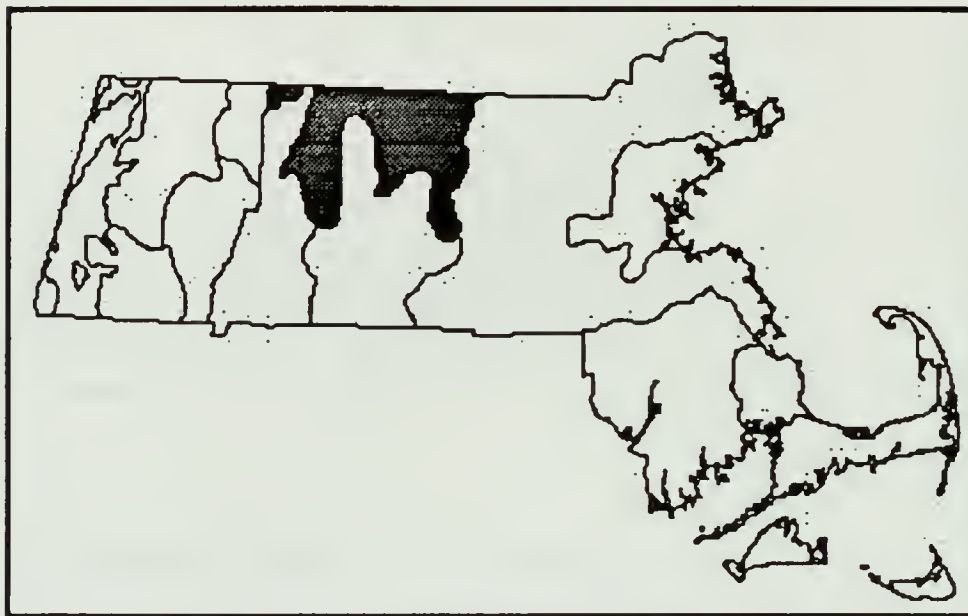
Other: Cedar/Hemlock type in New Jersey [Karlin 1988].

Author: J. Kearsley

Date: 7/21/99

Community Name:
Community ELCODE:
SRANK:
Tracked:

NORTHERN ATLANTIC WHITE CEDAR SWAMP
CP1B1A3000
S2
Yes

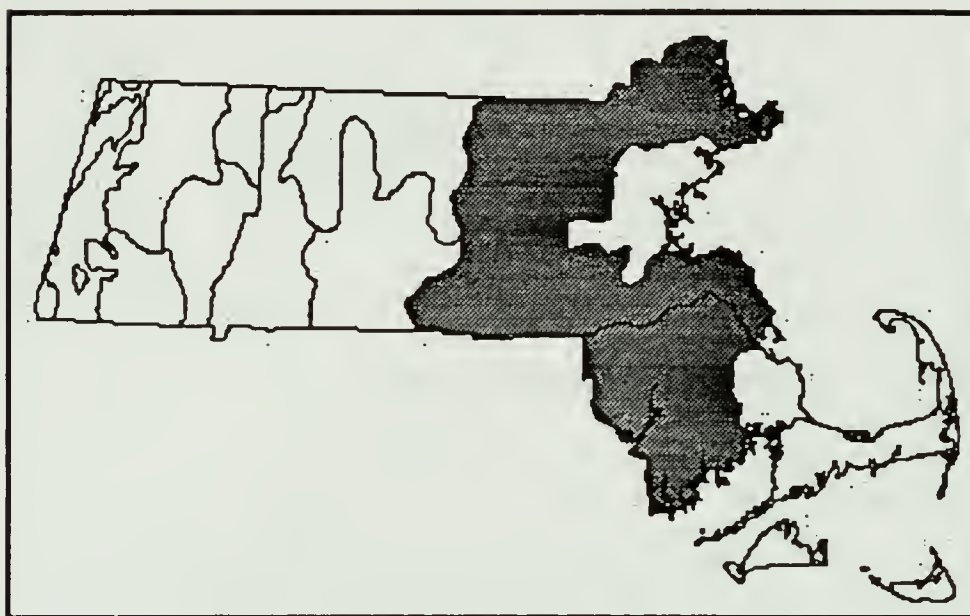


- Concept:** A variant of spruce-fir boreal swamps in which Atlantic white cedar is an associate in the tree canopy.
- Environmental setting:** Northern AWC swamps are restricted to basins at high elevations; the one described occurrence in Massachusetts occurs at an elevation of 1,110 feet and is currently the highest known elevation for Atlantic White-Cedar in the state. As with all AWC swamps, water-saturated peat overlies the mineral sediments, and standing water generally occurs for half of the growing season or longer. The water and soil are nutrient-poor, and particularly low in nitrogen and phosphorus. There is a high iron content in the soil; the iron, called "bog iron," was mined in the early days of manufacturing. Soil pH is acidic (3.1-5.5) and leaf litter decomposition is slow.
- Vegetation Description:** Northern conifers, such as black and red spruce (*Picea mariana* and *P. rubens*), and balsam fir (*Abies balsamea*) dominate the overstory, and Atlantic White-Cedar (*Chamaecyparis thyoides*) occurs as an associate. Shrubs and herbs are similar to those found in high-elevation Inland AWC swamps, especially mountain holly (*Nemopanthus mucronatus*), creeping snowberry (*Gaultheria procumbens*), and bunchberry (*Cornus canadensis*). Labrador tea (*Ledum groenlandicum*) and rhodora (*Rhododendron canadense*) are also common.
- Associations:** Motzkin (1991) described six AWC associations in Massachusetts. Northern AWC swamps are equivalent to his boreal evergreen swamp forest type.
- Habitat values for Associated Fauna:** Northern AWC swamps can function as vernal pool habitat if water remains standing for 2-3 months and they lack fish; these areas provide important amphibian breeding habitat.
- Associated rare plants:**
NONE KNOWN
- Associated rare animals:**
- | | | |
|--------------------------|----------------------|----|
| AMBYSTOMA JEFFERSONIANUM | JEFFERSON SALAMANDER | SC |
| HEMIDACTYLUM SCUTATUM | FOUR-TOED SALAMANDER | SC |
- Examples:** a site in Westminister.
- Threats:** See description under Coastal AWC swamps.
- Management needs:** See description under Coastal AWC swamps.
- Inventory need rank:** 3
- Inventory comments:** Inventory and vegetation classification completed by Glenn Motzkin in 1990. May be more sites in northern Worcester County.

Synonyms:
USNVC/TNC: Chamaecyparis thyoides-Picea rubens/Gaylussacia baccata/Gaultheria hispidula forest [CEGL006363].
MA [old name]: NNE Acidic seepage swamp, Atlantic white cedar association [CP3B2B1000].
ME: may be included within the Atlantic white cedar swamp community.
VT: not described.
NH: may be included within Coniferous basin swamp.
NY: not described.
CT: not described.
RI: not described.
Golet & Larson, 1974: Evergreen wooded swamp (WS-2).
Other:

Author: J. Kearsley **Date:** 7/21/99

Community Name: ALLUVIAL ATLANTIC WHITE CEDAR SWAMP
 Community ELCODE: CP1B1A4000
 SRANK: S2
 Tracked: Yes



Concept: Forested swamps occurring along low-gradient rivers where Atlantic white cedar is co-dominant with red maple in the overstory.

Environmental setting: Alluvial AWC swamps differ from other AWC wetlands in that they occur within the floodplain of rivers and streams or at the fringes of open marshy areas along ponds. They receive annual or semi-annual overbank flooding making them more mineral-rich than other AWC wetlands. As with all AWC swamps, water-saturated peat, generally about 1 m thick in alluvial examples, overlies the mineral sediments, and standing water generally occurs for half of the growing season or longer.

Vegetation Description: Alluvial AWC swamps are highly variable in their composition. Atlantic white-cedar (*Chamaecyparis thyoides*) and red maple (*Acer rubrum*) dominate the tree layer, and high-bush blueberry (*Vaccinium corymbosum*) and sweet pepperbush (*Clethra alnifolia*) occur in the shrub layer along with silky dogwood (*Cornus amomum*). The herb layer is comprised of species common to very wet, open or enriched sites, including sensitive fern (*Onoclea sensibilis*), royal fern (*Osmunda regalis*), bugleweed (*Lycopus* spp.), marsh fern (*Thelypteris palustris*), and marsh St. John's-wort (*Hypericum virginicum*).

Associations: Motzkin (1991) described six AWC associations in Massachusetts. Alluvial AWC swamps are equivalent to his Seasonally flooded type.

Habitat values for Associated Fauna: Alluvial AWC swamps can function as vernal pool habitat if water remains standing for 2-3 months and they lack fish; these areas provide important amphibian breeding habitat.

Associated rare plants:

LYCOPUS RUBELLUS	GYPSYWORT	E
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Associated rare animals:

AMBYSTOMA LATERALE	BLUE-SPOTTED SALAMANDER	SC
CLEMMYS GUTTATA	SPOTTED TURTLE	SC
CLEMMYS INSCULPTA	WOOD TURTLE	SC
CRANGONYX ABERRANS	MYSTIC VALLEY AMPHIPOD	SC
HEMIDACTYLUM SCUTATUM	FOUR-TOED SALAMANDER	SC
MITOURA HESSELI	HESSEL'S HAIRSTREAK	SC

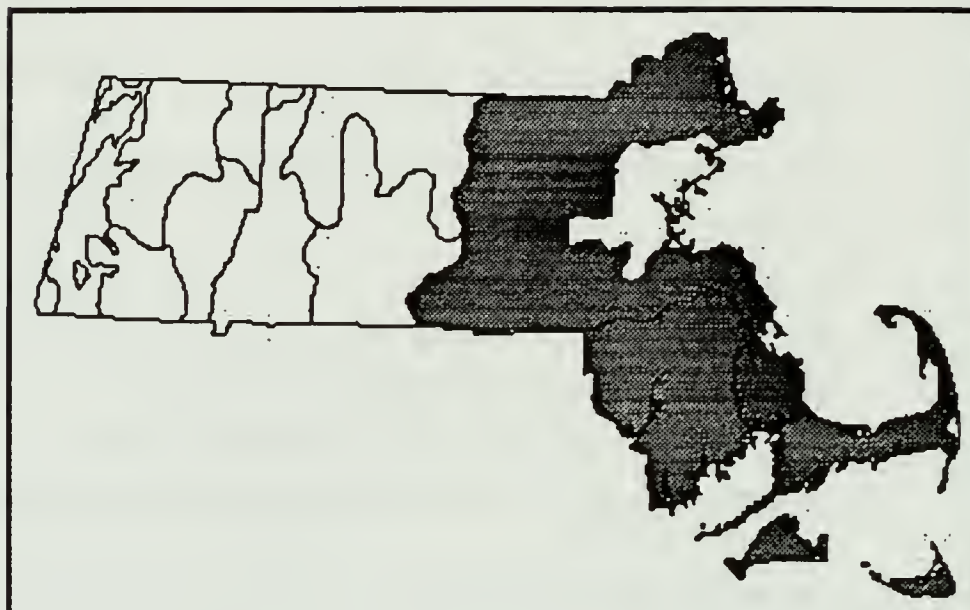
Examples: Known examples on the Canoe, Bungay, and Shingle Island Rivers.

Threats: See description under Coastal AWC swamps.

Management needs: See description under Coastal AWC swamps.
Inventory need rank: 3
Inventory comments: Inventory and vegetation classification completed by Glenn Motzkin in 1990.
Synonyms:
USNVC/TNC: Chamaecyparis thyoides-Acer rubrum/Vaccinium corymbosum/Triadenum virginicum forest [CEGL006364]
MA [old name]: SNE Streambottom forest, Atlantic white cedar association [CT2B2A1000]
ME: not described
VT: not described
NH: occur in state but are not described separately, included within Atlantic white cedar swamps
NY: included within Coastal plain Atlantic white cedar swamp
CT: Chamaecyparis thyoides/Vaccinium corymbosum community
RI: included within Atlantic white cedar swamp, Chamaecyparis thyoides-Acer rubrum-Betula alleghaniensis variant
Golet & Larson, 1974: Evergreen wooded swamp (WS-2)
Other:

Author: J. Kearsley **Date:** 7/21/99

Community Name: ATLANTIC WHITE CEDAR BOG
 Community ELCODE: CP1B1B2000
 SRANK: S2
 Tracked: Yes



Concept: Acidic forested peatlands with a nearly continuous heath shrub layer and an open canopy in which Atlantic white cedar is the characteristic tree species.

Environmental setting: Semi-forested level bogs with sphagnum mats. More information is needed on the physical characteristics of Atlantic white cedar forested bog communities.

Vegetation Description: Total canopy coverage is low, but Atlantic white cedar (AWC; *Chamaecyparis thyoides*) is dominant with scattered red maple (*Acer rubrum*). Other occasional associates are white pine (*Pinus strobus*), grey birch (*Betula populifolia*), pitch pine (*Pinus rigida*), and black spruce (*Picea mariana*). A low shrub layer is dominated by leatherleaf (*Chamaedaphne calyculata*) and sheep laurel (*Kalmia angustifolia*) mixed with clumps of tall shrubs including high-bush blueberry (*Vaccinium corymbosum*) and swamp azalea (*Rhododendron viscosum*). Other associated shrub species are (*Gaylussacia baccata*), rhodora (*Rhododendron canadense*), (*G. dumosa*), and bog rosemary (*Andromeda glaucophylla*). There is typically a well-formed Sphagnum moss layer below the shrubs, and large and small cranberry (*Vaccinium macrocarpon* and *V. oxycoccus*), sundews (*Drosera* spp.) and pitcher plants (*Sarracenia purpurea*) occur throughout.

Associations: Motzkin (1991) described six AWC associations in Massachusetts. AWC bogs are equivalent to his Cedar bog type.

Habitat values for Associated Fauna: The moats of AWC bogs can function as vernal pool habitat if water remains standing for 2-3 months and they lack fish; these areas provide important amphibian breeding habitat.

Associated rare plants:
 NONE KNOWN

Associated rare animals:

AMBYSTOMA LATERALE	BLUE-SPOTTED SALAMANDER	SC
MITOURA HESSELI	HESSEL'S HAIRSTREAK	SC
PAPAPEMA APPASSIONATA	PITCHER PLANT BORER MOTH	SC

Examples: Mashpee pine barrens, Mashpee.

Threats: See description under Coastal AWC swamps.

Management needs: See description under Coastal AWC swamps.

Inventory need rank: 3

Inventory comments: Inventory and vegetation classification completed by Glenn Motzkin in 1990.

Synonyms:

USNVC/TNC: included in *Chamaecyparis thyoides*/*Chamaedaphne calyculata* woodland [CEGL006321].

MA [old name]: not tracked.

ME: ?

VT: not described.

NH: ?

NY: not described.

CT: ?

RI: ?

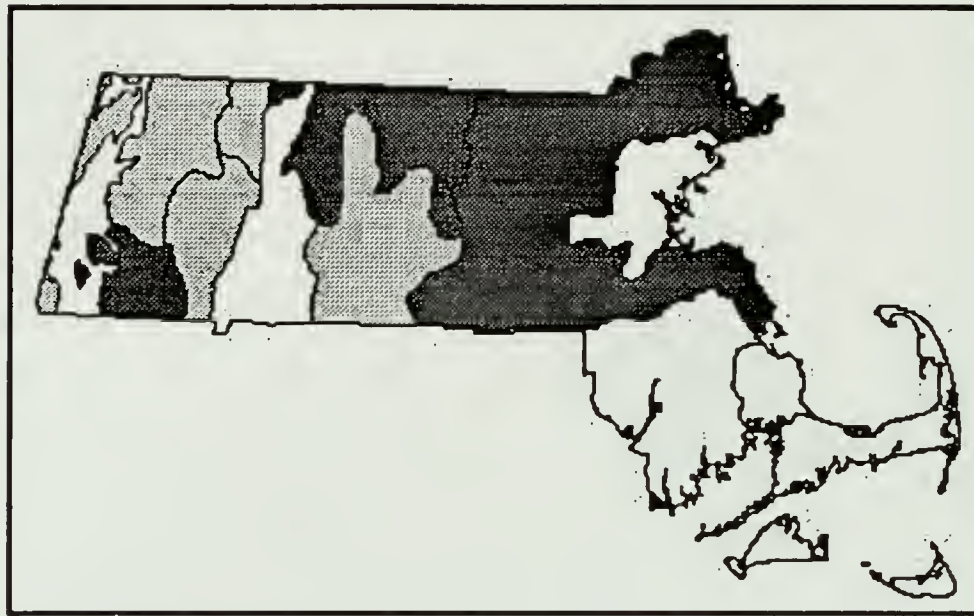
Golet & Larson, 1974:

Other:

Author: J. Kearsley

Date: 7/21/99

Community Name: **SPRUCE-TAMARACK BOG**
 Community ELCODE: CP1B1B1000
 SRANK: S2
 Tracked: Yes



- Concept:** Acidic forested peatlands with an overstory of black spruce and tamarack and an understory of heath shrubs on sphagnum moss.
- Environmental setting:** Forested bogs occur in a variety of physical settings, primarily in the north-central and western parts of the state. They occur in kettlehole depressions, watershed divides, and along pond margins. Forested bogs are late-successional peatlands that typically occur on thick peat deposits.
- Vegetation Description:** Black spruce (*Picea mariana*) and tamarack (*Larix laricina*) are dominant in the overstory. Red spruce (*Picea rubens*) can occur in place of black spruce. The trunks and branches are often covered and draped in lichens, especially *Usnea* spp. Other trees that occur in lesser amounts are white pine (*Pinus strobus*), pitch pine (*Pinus rigida*), and red maple (*Acer rubrum*), but red spruce (*Picea rubens*) can also occur. A mixture of tall shrubs and short, ericaceous shrubs provide nearly continuous cover in the understory. Labrador tea (*Ledum groenlandicum*) and bog-laurel (*Kalmia polifolia*) are good indicators of the community, but they do not always occur. Other common shrubs are mountain-holly (*Nemopanthus mucronatus*), wild raisin (*Viburnum nudum* var. *cassinoides*), and sheep-laurel (*Kalmia angustifolia*). The ground is covered in Sphagnum spp. moss with three-seeded bog sedge (*Carex trisperma*), three-leaved Solomon's seal (*Maianthemum trifolium*), bluebead-lily (*Clintonia borealis*), goldthread (*Coptis trifolia* ssp. *groenlandica*), and creeping snowberry (*Gaultheria hispidula*).
- Associations:** No associations have been described in Massachusetts.
- Habitat values for Associated Fauna:** The moats of forested bogs can function as vernal pool habitat if water remains standing for 2-3 months and they lack fish; these areas provide important amphibian breeding habitat.
- Associated rare plants:**
- | | | |
|-----------------------|-----------------|----|
| ARCEUTHOBIUM PUSILLUM | DWARF MISTLETOE | SC |
|-----------------------|-----------------|----|
- Associated rare animals:**
- NONE KNOWN
- Examples:** Poutwater Pond, MDC, Sterling.
- Threats:** More work is needed to identify threats to black spruce-tamarack forested bogs.
- Management needs:** More work is needed to assess the management needs of black spruce-tamarack forested bogs.
- Inventory need rank:** 1
- Inventory comments:** Statewide inventory will be important follow-up to 1998 inventory of non-forested acidic peatlands reported in Kearsley (1999).

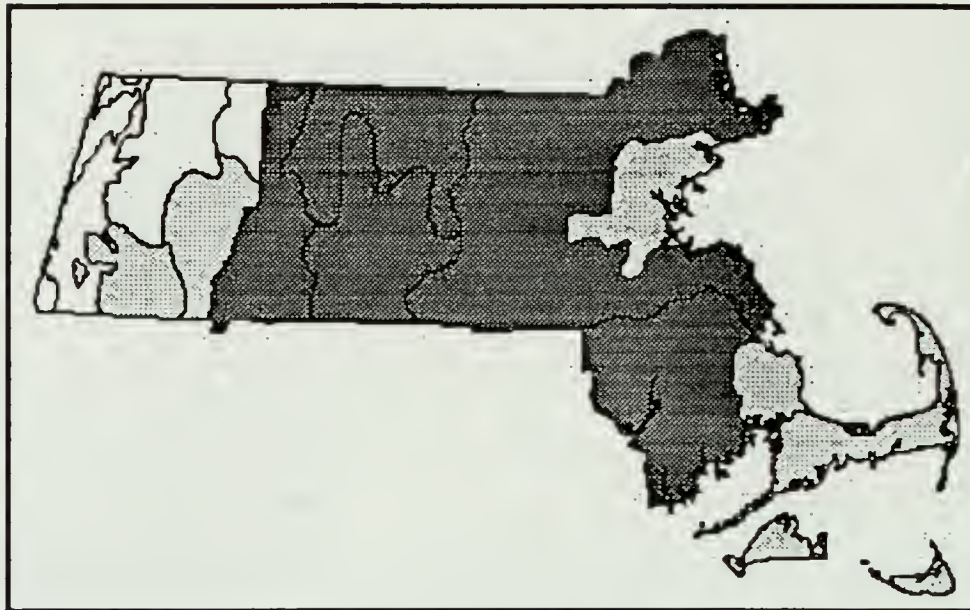
Synonyms:

USNVC/TNC: Picea mariana/Kalmia angustifolia/Sphagnum spp. Forest [CEGL006168]
MA [old name]: not described, part of Northern New England level bog [CP2C2B0000]
ME: Forested bog community
VT: Black spruce bog [woodland]
NH: Black spruce-larch basin swamp
NY: Black spruce-tamarack bog
CT: not described
RI: Black spruce bog
Golet & Larson, 1974: Wooded bog (BG-2)

Other:

Author: J. Kearsley **Date:** 7/21/99

Community Name: **RED MAPLE SWAMP**
 Community ELCODE: CP1A2A1000
 SRANK: S5
 Tracked: No



Concept: Acidic forested swamps with red maple dominant in the overstory. Red maple swamps are the most common forested wetlands in Massachusetts.

Environmental setting: Red maple swamps occur in a variety of physical settings. Golet et al. (1993) describe three basic types: hillside seeps and upland drainageways fed primarily by groundwater seepage and overland flow; seasonally flooded basin swamps in undrained basins; and alluvial swamps. The last category is classified separately in Massachusetts as Alluvial Swamp Forest. Depending on the physical setting, red maple swamps receive water through surface runoff, groundwater inputs, or stream and lake overflow. The hydrogeologic setting is the primary determinant of water regime and the plant community structure and composition. pH ranges from less than 4 to 7. Soils have shallow to thick organic layers overlying mineral sand s/silts.

Vegetation Description: Red maple is usually strongly dominant in the overstory, and often provides more than 90% of the canopy cover. A variable mixture of tree species co-occurs with red maple, including yellow birch (*Betula alleghaniensis*), black gum (*Nyssa sylvatica*), white ash (*Fraxinus americana*), white pine (*Pinus strobus*), American elm (*Ulmus americana*), and hemlock (*Tsuga canadensis*). Pin oak (*Quercus palustris*), and swamp white oak (*Quercus bicolor*). Atlantic white cedar (*Chamaecyparis thyoides*) is a common associate in coastal areas and locally at sites in central Massachusetts and the lower Connecticut Valley. When Atlantic white cedar is dominant in the overstory, the community is classified as an Atlantic white cedar swamp. The shrub layer of red maple swamps is often dense and well-developed, generally with >50% cover but it can be variable. In eastern Massachusetts, sweet pepperbush (*Clethra alnifolia*) and swamp azalea (*Rhododendron viscosum*) are the dominant shrubs. Other common shrubs are highbush blueberry (*Vaccinium corymbosum*) and common winterberry (*Ilex verticillata*), which are often dominant, and spicebush (*Lindera benzoin*); usually in richer areas, northern arrow-wood (*Viburnum dentatum* var. *lucidum*), speckled alder (*Alnus incana* ssp. *rugosa*), nannyberry (*Viburnum lentago*), and poison sumac (*Toxicodendron vernix*). The herbaceous layer is highly variable, but ferns are usually abundant. Cinnamon fern (*Osmunda cinnamomea*) is common; other ferns include sensitive fern (*Onoclea sensibilis*), royal fern (*Osmunda regalis*), marsh fern (*Thelypteris palustris*), and spinulose wood fern (*Dryopteris carthusiana*). Graminoids are common, mixed with a variety of herbaceous species. Some of the most common herbaceous species are skunk cabbage (*Symplocarpus foetidus*), false hellebore (*Veratrum viride*), spotted touch-me-not (*Impatiens capensis*), swamp dewberry (*Rubus hispidus*), marsh marigold (*Caltha palustris*), and the bugleweeds (*Lycopus* spp.). Rich variants of red maple swamps occur, apparently associated with groundwater seepage. Two rich variants are tracked separately: 1. "Calcareous seepage swamps" are black ash-tamarack-red maple associations with abundant calciphilic herbaceous species occurring on calcareous bedrock in western Massachusetts, and 2. "Black ash swamps" have black ash co-dominant in the canopy, a high diversity of herbaceous species, and appear to occur in areas with circumneutral seepage. There are also rich variants of red maple swamps that lack the black ash of "black ash seepage swamps" and the calciphiles of "calcareous seepage swamps." More information is needed on rich red maple swamps; they may warrant separate tracking.

Associations: No associations have been described in Massachusetts.

Habitat values for Associated Fauna: Red maple swamps can function as vernal pool habitat in sections that have two or three months of ponding and lack fish; these sections provide important amphibian breeding habitat.

Associated rare plants: [Many of the rare plants listed below occur only in rich variants of red maple swamps]

ASTER PRENANTHOIDES	CROOKED-STEM ASTER	SC
CAREX GRAYI	GRAY'S SEDGE	T
CLAYTONIA VIRGINICA	NARROW-LEAVED SPRING BEAUTY	T
CONIOSELINUM CHINENSE	HEMLOCK PARSLEY	SC
CYPRIPEDIUM CALCEOLUS VAR PARVIFLORUM	SMALL YELLOW LADY'S-SLIPPER	E
CYPRIPEDIUM REGINAE	SHOWY LADY'S-SLIPPER	SC
HYDROPHYLLUM CANADENSE	BROAD WATERLEAF	E
LOBELIA SIPHILITICA	GREAT BLUE LOBELIA	T
LYCOPUS RUBELLUS	GYPSYWORT	E
MALAXIS BRACHYPODA	WHITE ADDER'S-MOUTH	T
PEDICULARIS LANCEOLATA	SWAMP LOUSEWORT	E
PETASITES FRIGIDUS VAR PALMATUS	SWEET COLTSFOOT	T
SPHENOPHOLIS PENNSYLVANICA	SWAMP OATS	T
VIOLA BRITTONIANA	BRITTON'S VIOLET	T

Associated rare animals:

AMBYSTOMA JEFFERSONIANUM	JEFFERSON SALAMAND ER	SC
AMBYSTOMA LATERALE	BLUE-SPOTTED SALAMAND ER	SC
AMBYSTOMA OPACUM	MARbled SALAMAND ER	T
CIRCUS CYANEUS	NORTHERN HARRIER	T
CLEMMYS GUTTATA	SPOTTED TURTLE	SC
CRANGONYX ABERRANS	MYSTIC VALLEY AMPHIPOD	SC
DESMOCERUS PALLIATUS	ELDERBERRY LONG-HORNED BEETLE	SC
EMYDOIDEA BLAND INGHII	BLAND INGH'S TURTLE	T
GYRINOPHILUS PORPHYRITICUS	SPRING SALAMAND ER	SC
HEMIDACTYLUM SCUTATUM	FOUR-TOED SALAMAND ER	SC
PAPAPEMA SULPHURATA	WATER-WILLOW STEM BORER	T
SOREX PALUSTRIS	WATER SHREW	SC

Examples: Broad Meadow Brook W.S. MAS, Worcester, Apponagansett Swamp, New Bedford.

Threats: Conversion to agriculture; filling for development and highway construction; upland development adjacent to swamps impacts normal hydrology and geochemistry.

Management needs: Control of European buckthorn (*Rhamnus frangula*)

Inventory need rank: 2

Inventory comments:

Synonyms:

USNVC/TNC: similar to *Acer rubrum*-(*Chamaecyparis thyoides*)/*Rhododendron maximum* forest [CEGL006396] but without *R. maximum* in MA; more similar to *Acer rubrum*-*Nyssa sylvatica*-*Betula alleghaniensis* / *Sphagnum* spp. Forest [CEGL006014]

MA [old name]: Southern New England basin swamp [CP2B2A0000]

ME: Red maple swamp community

VT: Red maple-black ash swamp, red maple-black gum swamp, red maple-northern white cedar swamp

NH: Basin swamp

NY: Red maple-hardwood swamp

CT: *Acer rubrum*/*Lindera benzoin* community, *Acer rubrum*/*Onoclea sensibilis* community, *Acer rubrum*/*Ilex verticillata*-*Vaccinium corymbosum* community

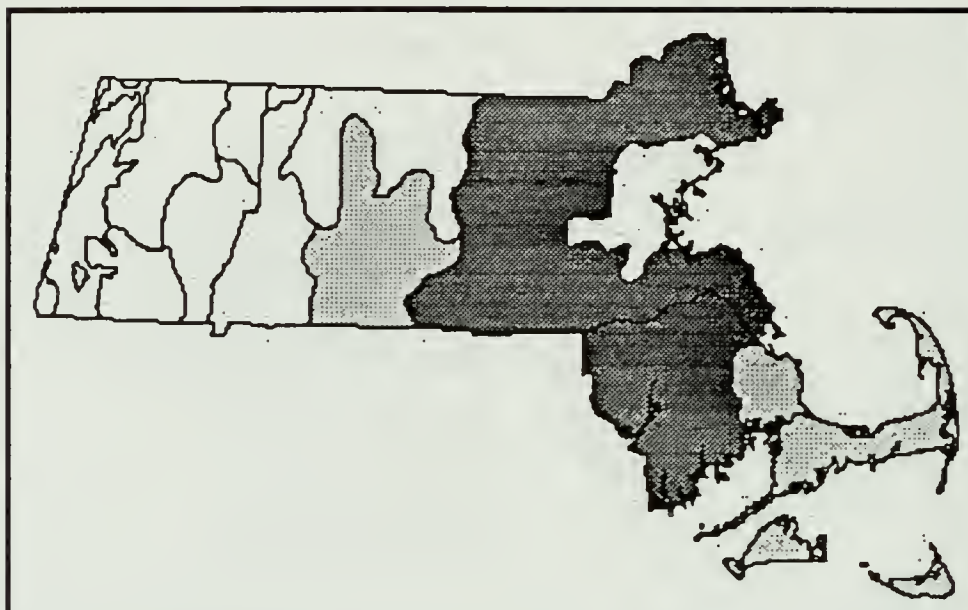
RI: *Acer rubrum*-deciduous shrub swamp

Golet & Larson, 1974: Deciduous wooded swamp (WS-1)

Author: J. Kearsley

Date: 7/21/99

Community Name: **ALLUVIAL RED MAPLE SWAMP**
Community ELCODE: CP1A2A1A00
SRANK: S3
Tracked: Yes



- Concept:** A richer variant of red maple swamp that occurs in low areas along rivers and streams that experience overbank flooding.
- Environmental setting:** Alluvial red maple swamp forests occur along mainstem sections of smaller rivers in eastern Massachusetts (*Nashua Assabet, Shawsheen, Concord, and Three Mile*). They experience overbank flooding, but they appear to be more poorly drained than true floodplain forests. Soils are typically silt loams with pronounced soil mottling and a surface organic layer.
- Vegetation Description:** The overstory of alluvial red maple swamps is characterized by a mixture of red maple (*A. rubrum*) and silver maple (*Acer saccharinum*; particularly along riverbanks) with lesser amounts of green ash (*Fraxinus pennsylvanica*) and/or swamp white oak (*Quercus bicolor*). Red oak (*Q. rubra*), white pine (*Pinus strobus*), and black cherry (*Prunus serotina*) occur in elevated sections. Unlike true floodplain forests, alluvial swamp forests have well-developed shrub layers composed of northern arrow-wood (*Viburnum dentatum* var. *lucidum*), silky dogwood (*Cornus amomum*), and the non-native plant European buckthorn (*Rhamnus frangula*). The herbaceous layer is often dominated by sensitive fern (*Onoclea sensibilis*) and false nettle (*Boehmeria cylindrica*) mixed with a rich assemblage of herbaceous species that commonly includes royal fern (*Osmunda regalis*), awned sedge (*Carex crinita*), and bugleweeds (*Lycopus* spp.).
- Associations:** One association was described in Kearsley [1998]: Type V-Alluvial swamp forests (*Acer rubrum*-*A. saccharinum*-*Q. bicolor* Association).
- Habitat values for** Alluvial red maple swamps, especially at the upland fringe or in old meander scars and oxbows, can function as vernal pool habitat if water remains standing for 2-3 months and they lack fish; these areas provide important amphibian breeding habitat. Riverine odonates use adjacent alluvial red maple swamps for shelter.

Associated rare plants:

BETULA NIGRA	RIVER BIRCH	- WL
CAREX TYPHINA	CAT-TAIL SEDGE	T

Associated rare animals:

CLEMMYS GUTTATA	SPOTTED TURTLE	SC
CLEMMYS INSCULPTA	WOOD TURTLE	SC
EMYDOIDEA BLAND INGII	BLAND ING'S TURTLE	T
GOMPHUS VASTUS	COBRA CLUBTAIL	SC
GOMPHUS VENTRICOSUS	SKILLET CLUBTAIL	SC

NEUROCORDULIA OBSOLETA	UMBER SHADOWDRAGON	SC
OPHIOGOMPHUS ASPERSUS	BROOK SNAKETAIL	SC
OPHIOGOMPHUS CAROLUS	RIFFLE SNAKETAIL	T
SOMATOCHLORA CINGULATA	LAKE EMERALD	SC
SOMATOCHLORA ELONGATA	SKI-TAILED EMERALD	SC
SOMATOCHLORA GEORGIANA	COPPERY EMERALD	E
SOMATOCHLORA KENNEDYI	KENNEDY'S EMERALD	E
SOMATOCHLORA LINEARIS	MOCHA EMERALD	SC

Examples: parts of Fort Devens, Nashua River, sections of the Blackstone and Concord Rivers.

Threats: Invasion of non-native plant species, including moneywort (*Lysimachia nummularia*) and European buckthorn (*Rhamnus frangula*).

Management needs: Removal of non-native plant species.

Inventory need rank: 2

Inventory comments:

Synonyms:

USNVC/TNC: Acer rubrum-Fraxinus (*pennsylvanica*, *americana*)/Lindera benzoin/Symplocarpus foetidus forest [CEGL006406]; Quercus bicolor-Acer rubrum/Carpinus caroliniana forest [CEGL006386]; Acer rubrum/Carex stricta-Onoclea sensibilis woodland [CEGL006119].

MA [old name]: Southern New England stream bottom forest [CT2B2A0000].

ME: included within Hardwood floodplain forest community and /or Red maple swamp community.

VT: not described.

NH: Red maple floodplain forest.

NY: similar to Silver maple-ash swamp.

CT: similar to Acer rubrum/Lindera benzoin community but with swamp white oak.

RI: may be included within Acer rubrum-deciduous shrub swamp.

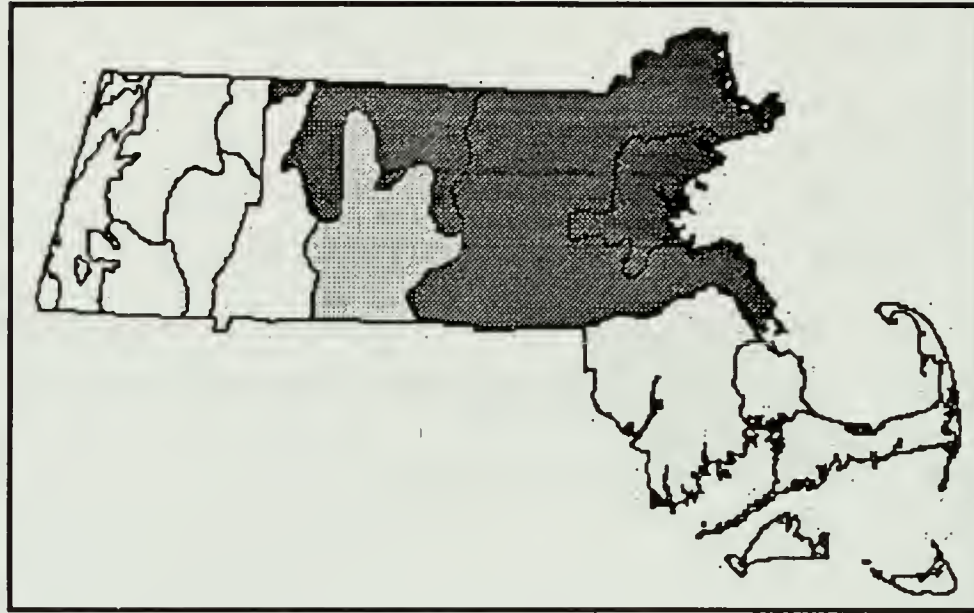
Golet & Larson, 1974: Deciduous wooded swamp (WS-1).

Other:

Author: J. Kearsley **Date:** 7/21/99

Community Name:
Community ELCODE:
SRANK:
Tracked:

BLACK ASH SWAMP
CP1A2A2000
S2
Yes



- Concept:** A variant of red maple swamps in which black ash (*Fraxinus nigra*) is co-dominant in the canopy. Black ash swamps are associated with circumneutral groundwater seepage.
- Environmental setting:** Black ash swamps typically occur in areas with circumneutral groundwater seepage. They can occur at the edge of river floodplains adjacent to the upland slope where seepage input occurs, as small seepy pockets within a larger matrix of red maple swamp, or at the headwaters of streams, which may be the typical location in northern and western parts of the state. The pH of black ash swamps in Essex Co. ranges between 7.0 and 7.4 [MacDougall, pers. comm.]. More information is needed on the physical characteristics of black ash seepage swamps.
- Vegetation Description:** Black ash (*Fraxinus nigra*) is co-dominant with red maple (*Acer rubrum*) in the overstory. There are lesser amounts of sugar maple (*Acer saccharum*), Eastern hemlock (*Tsuga canadensis*), yellow birch (*Betula alleghaniensis*), and white pine (*Pinus strobus*). Ironwood (*Carpinus caroliniana*) is common in the sub-canopy, but it does not always occur. Common shrubs are spicebush (*Lindera benzoin*), winterberry (*Ilex verticillata*), highbush blueberry (*Vaccinium corymbosum*), mountain holly (*Nemopanthus mucronata*), northern arrow-wood (*Viburnum dentatum* var. *lucidum*), and occasional witch hazel (*Hamamelis virginiana*). Skunk cabbage (*Symplocarpus foetidus*) and cinnamon fern (*Osmunda cinnamomea*) are common herb species. Other herbaceous associates include sensitive fern (*Onoclea sensibilis*), royal fern (*Osmunda regalis*), lady fern (*Athyrium filix-femina*), jack-in-the-pulpit (*Arisaema triphyllum*), tussock sedge (*Carex stricta*), swamp-saxifrage (*Saxifraga pensylvanica*), and jewelweed (*Impatiens capensis*). The micro-topography is hummock and hollow with abundant Sphagnum spp. moss, particularly on the hummocks. Black ash swamps occurring in Berkshire Co. or the Connecticut Valley that have species-rich herbaceous layers, with more than 40 species, and calcareous indicator species including delicate sedge (*Carex leptalea*), brome-like sedge (*Carex bromoides*), long-stalked sedge (*Carex pedunculata*), rough-leaved goldenrod (*Solidago patula*), and golden ragwort (*Senecio aureus*) are classified separately as "black ash-red maple-tamarack calcareous seepage swamps."
- Associations:** No associations have been described in Massachusetts.
- Habitat values for Associated Fauna:** Black ash swamps can function as vernal pool habitat if water remains standing for 2-3 months and they lack fish; these areas provide important amphibian breeding habitat.
- Associated rare plants:**
NONE KNOWN

Associated rare animals:

CLEMMYS GUTTATA	SPOTTED TURTLE	SC
CLEMMYS INSCULPTA	WOOD TURTLE	SC
EMYDOIDEA BLAND INGII	BLAND ING'S TURTLE	T
PAPAPEMA SP 2	OSTRICH FERN BORER MOTHS	SC

Examples: Cedar Swamp, Reading; Satan's Kingdom WMA, Northfield.

Threats: Known threats include alteration of natural seepage and logging. More information is needed to determine the greatest threats to black ash seepage swamps.

Management needs: More information is needed to assess the management needs of black ash seepage swamps.

Inventory need rank: 1

Inventory comments:

Synonyms:

USNVC/TNC: Fraxinus nigra-Acer rubrum/Nemopanthus mucronata-Vaccinium corymbosum forest [CEGL006220].

MA [old name]: Southern New England acidic seepage swamp, black ash swamp [CP3B2A1C00].

ME: not described.

VT: Red maple-black ash swamp.

NH: Calcareous/circumneutral hardwood seepage swamp.

NY: not described.

CT: not described.

RI: not described.

Golet & Larson, 1974: Deciduous wooded swamp (WS-1).

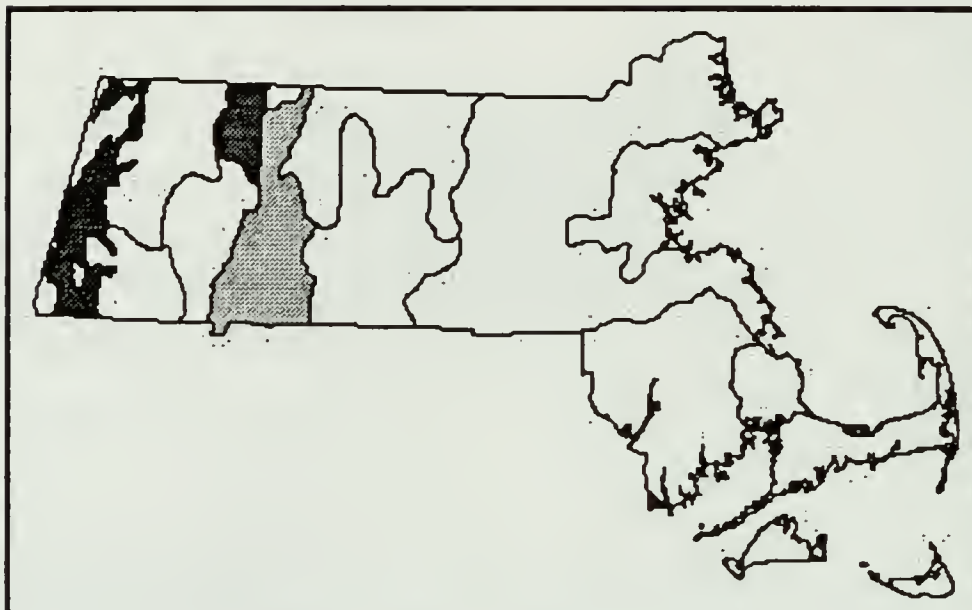
Other:

Author: J. Kearsley

Date: 7/21/99

Community Name:
Community ELCODE:
SRANK:
Tracked:

BLACK ASH-RED MAPLE-TAMARACK CALCAREOUS SEEPAGE SWAMP
CP1B2B0000
S2
Yes



Concept: Mixed deciduous-coniferous forested swamps occurring in areas where there is calcareous groundwater seepage. The species-rich herbaceous layer is characterized by calcium-loving species. Calcareous seepage swamps can also be called forested fens.

Environmental setting: The occurrence of calcareous or circumneutral groundwater seepage defines this community. The more calcareous the seepage, the more rare plant species are likely to be found. Soils are mineral but with a thin layer of peat accumulation at the surface. More information is needed on the physical characteristics of this community.

Vegetation Description: A variable mixture of deciduous and coniferous trees forms the canopy, but black ash (*Fraxinus nigra*), tamarack (*Larix laricina*), and red maple (*Acer rubrum*) are most common. Other associated tree species at low elevations, less than 1,000 ft., are bur oak (*Quercus macrocarpa*), yellow oak (*Q. muehlenbergii*), yellow birch (*Betula alleghaniensis*), American elm (*Ulmus americana*), white pine (*Pinus strobus*), and hemlock (*Tsuga canadensis*). At higher elevations, red spruce (*Picea rubens*), balsam fir (*Abies balsamea*), and Canada yew (*Taxus canadensis*) can also occur. Ironwood (*Carpinus caroliniana*) is characteristic of the subcanopy. The shrub layer can be dense, and characteristic species are poison sumac (*Toxicodendron vernix*) and alder-leaf buckthorn (*Rhamnus alnifolia*), mixed with speckled alder (*Alnus rugosa*), gray dogwood (*Cornus racemosa*), winterberry (*Ilex verticillata*), spicebush (*Lindera benzoin*), meadowsweet (*Spiraea latifolia*), and highbush blueberry (*Vaccinium corymbosum*). Shrubby cinquefoil (*Pentaphylloides floribunda*) often occurs in open areas. The herbaceous layer is diverse with many calciphilic (calcium-loving) species mixed in with other common wetland plants. Characteristic calciphiles are delicate sedge (*Carex leptalea*), brome-like sedge (*Carex bromoides*), long-stalked sedge (*Carex pedunculata*), rough-leaved goldenrod (*Solidago patula*), and golden ragwort (*Senecio aureus*). Other typical species in the herbaceous layer are skunk cabbage (*Symplocarpus foetidus*), sensitive fern (*Onoclea sensibilis*), royal fern (*Osmunda regalis*), jewelweed (*Impatiens capensis*), and naked mitrewort (*Mitella nuda*). This community type also has a concentration of state-protected rare plant species.

Associations: No associations have been described in Massachusetts.

Habitat values for Associated Fauna: Calcareous seepage swamps can function as vernal pool habitat if water remains standing for 2-3 months and they lack fish; these areas provide important amphibian breeding habitat.

Associated rare plants:

CAREX SCHWEINITZII	SCHWEINITZ'S SEDGE	E
CONIOSELINUM CHINENSE	HEMLOCK PARSLEY	SC
CYPRIPEDIUM REGINAE	SHOWY LADY'S-SLIPPER	SC
MALAXIS BRACHYPODA	WHITE ADDER'S-MOUTH	T

PYROLA ASARIFOLIA VAR PURPUREA	PINK PYROLA	E
QUERCUS MACROCARPA	MOSSY-CUP OAK	SC
QUERCUS MUEHLENBERGII	YELLOW OAK	SC
RIBES TRISTE	SWAMP RED CURRANT	- WL

Associated rare animals:

AMBYSTOMA JEFFERSONIANUM	JEFFERSON SALAMANDER	SC
CLEMMYS GUTTATA	SPOTTED TURTLE	SC
CLEMMYS INSCULPTA	WOOD TURTLE	SC
CLEMMYS MUHLENBERGII	BOG TURTLE	E
HEMIDACTYLUM SCUTATUM	FOUR-TOED SALAMANDER	SC
WILLIAMSONIA FLETCHERI	EBONY BOGHAUNTER	E

Examples: most examples occur in Berkshire County.

Threats: Logging, nutrient inputs such as road salts, damming by beavers, and alterations of water levels threaten this community. Water level disturbance can lead to the invasion by non-native plants, including the aggressive exotics purple loosestrife (*Lythrum salicaria*), Tatarian honeysuckle (*Lonicera tatarica*), and Morrow's honeysuckle (*Lonicera morrowii*). Phragmites (*Phragmites australis*) is also an aggressive exotic in disturbed forested fens.

Management needs: Removal/control of non-native plant species, especially phragmites.

Inventory need rank: 3

Inventory comments: Good plot data and community descriptions available. Ranking specifications need to be established.

Synonyms:

USNVC/TNC: Fraxinus nigra-Acer rubrum-(Larix laricina)/Rhamnus alnifolia forest [CEGL006009]; Fraxinus nigra-Acer rubrum/Nemopanthus mucronata-Vaccinium corymbosum forest [CEGL006220].

MA [old name]: SNE Calcareous Seepage Swamp [CP3B1A0000].

ME: not described.

VT: Tamarack-red maple forested fen.

NH: Calcareous/circumneutral hardwood seepage swamp; Hardwood-conifer seepage swamp.

NY: Rich hemlock-hardwood peat swamp; Red maple-tamarack peat swamp.

CT: similar to Acer rubrum-Fraxinus nigra/Ranunculus hispidus var. caricetorum community; Acer rubrum/Lindera benzoin community.

RI: not described.

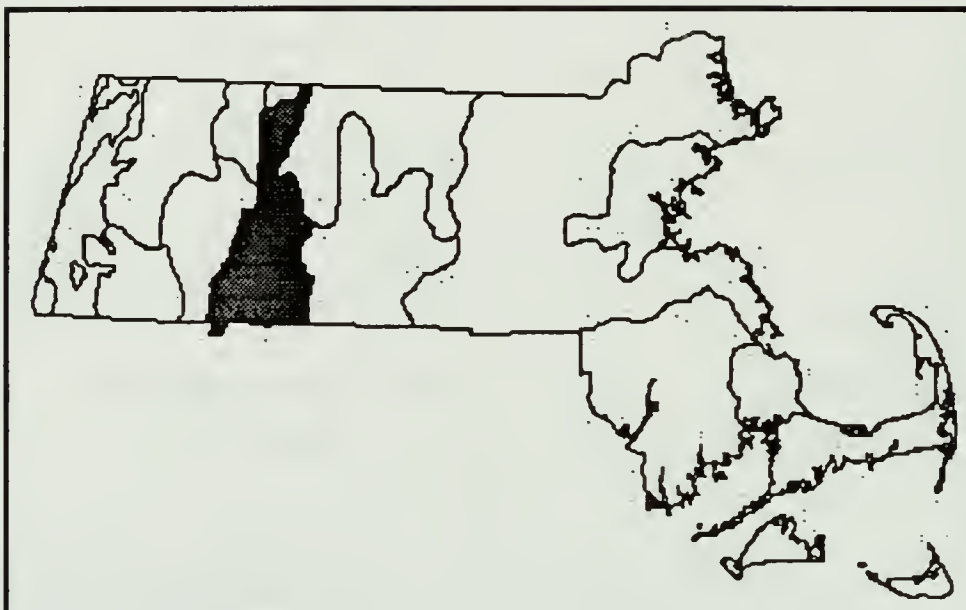
Golet & Larson, 1974: Deciduous wooded swamp (WS-1); Evergreen wooded swamp (WS-2).

Other: Forested fen community [Weatherbee 1996]; Rich forested Swamp [Motzkin 1995]

Author: J. Kearsley **Date:** 7/21/99

Community Name:
Community ELCODE:
SRANK:
Tracked:

BLACK GUM - PIN OAK - SWAMP WHITE OAK "PERCHED" SWAMP
CPIA2A3000
S2
Yes



Concept: A red maple-dominated basin swamp in which black gum, pin oak, and swamp white oak are important components of the overstory. This vegetation association is limited to lakebed sediments of glacial Lake Hitchcock in the Connecticut Valley.

Environmental setting: These swamp forests generally occur in basins that have little or no slope where deposits of lake-bottom clays are overlain by silt and sand. The lake-bottom clays appear to be impermeable which creates a "perched" water table isolated from groundwater. There may be some connection to the groundwater along the margins of these wetlands or, to a more limited degree, through slow vertical movement. Periodic flooding occurs as indicated by the lack of organic matter accumulation. More information is needed to determine if this association is restricted to areas of perched water tables.

Vegetation Description: Red maple (*Acer rubrum*) dominates the overstory, but the southern tree species—black gum (*Nyssa sylvatica*), pin oak (*Quercus palustris*), and swamp white oak (*Quercus bicolor*)—are co-dominant. Eastern hemlock (*Tsuga canadensis*) is a common associate. There is pronounced hummock-hollow topography, and most plants, except the sedges, are confined to the hummocks. The shrub layer is similar to other swamp forests. Common species include highbush blueberry (*Vaccinium corymbosum*), northern arrow-wood (*Viburnum dentatum* var. *lucidum*), common winterberry (*Ilex verticillata*) and serviceberry (*Amelanchier* spp.). The herbaceous layer is variable, but cinnamon fern (*Osmunda cinnamomea*) occurs at all known sites. Other common herbaceous species are Canada mayflower (*Maianthemum canadense* var. *canadense*), goldthread (*Coptis trifolia* ssp. *groenlandica*), Indian cucumber-root (*Medeola virginiana*), and various sedge species (*Carex* spp.).

Associations: No associations have been described in Massachusetts.

Habitat values for Associated Fauna: Perched swamps can function as vernal pools in sections that have extended periods of ponding, 2-3 months, and lack fish; these sections provide important amphibian breeding habitat.

Associated rare plants:

CLAYTONIA VIRGINICA	NARROW-LEAVED SPRING BEAUTY	T
LYGODIUM PALMATUM	CLIMBING FERN	SC
PETASITES FRIGIDUS VAR PALMATUS	SWEET COLTSFOOT	T

Associated rare animals:

AMBYSTOMA JEFFERSONIANUM	JEFFERSON SALAMAND ER	SC
AMBYSTOMA LATERALE	BLUE-SPOTTED SALAMAND ER	SC
CLEMMYS GUTTATA	SPOTTED TURTLE	SC
CLEMMYS INSCULPTA	WOOD TURTLE	SC
HEMIDACTYLIUM SCUTATUM	FOUR-TOED SALAMAND ER	SC

Examples: Lawrence Swamp, Amherst; Great Swamp, Whately.

Threats: It is likely that this community type once covered a larger area of the Connecticut Valley, but much of the lake bottom has been cleared and converted to agriculture. Only patches of these perched swamps remain. Current threats include alteration of water chemistry from road and farm runoff, in particular, the accumulation of road salts, ditching by land owners to drain water, and logging.

Management needs: Disturbed areas appear to have large amounts of European buckthorn (*Rhamnus frangula*). Efforts to prevent further disturbance may prevent the spread of this invasive plant species.

Inventory need rank: 3

Inventory comments: Inventory and community characterization completed by Karen Searcy et al. in 1993.

Synonyms:

USNVC/TNC: not described; most similar to *Quercus palustris*-*Acer rubrum*/*Osmunda cinnamomea* forest.

MA [old name]: Tupelo-pin oak-swamp white oak association [CT2F1A1000].

ME: not described.

VT: not described.

NH: not described.

NY: similar environmental setting to Perched swamp white oak swamp but with different species.

CT: *Acer rubrum*/*Onoclea sensibilis* community [has pin oak and swamp white oak as associates; occurs on glacial lake sediments].

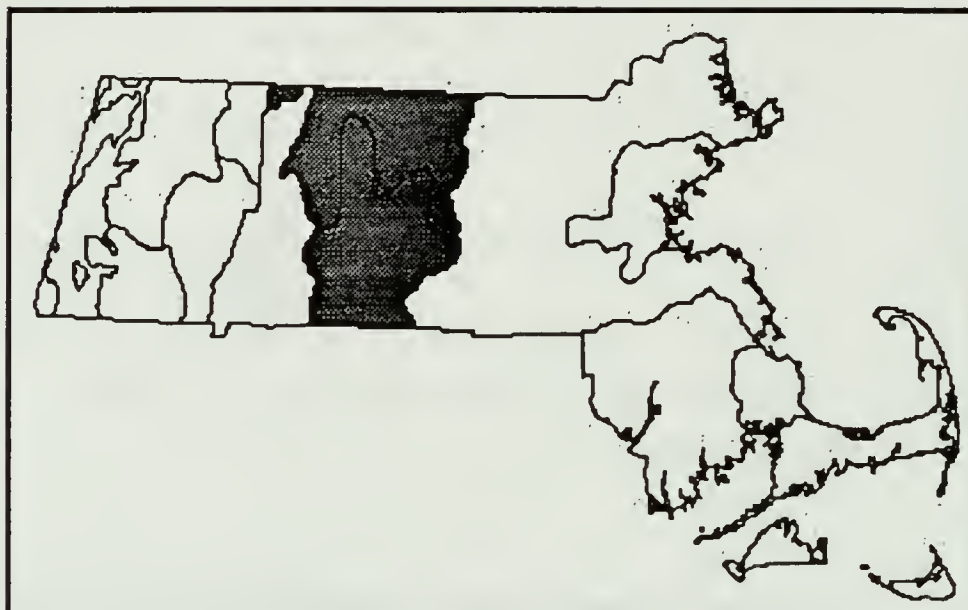
RI: probably included within *Acer rubrum*-deciduous shrub swamp.

Golet & Larson, 1974: Deciduous wooded swamp (WS-1).

Other:

Author: J. Kearsley **Date:** 7/21/99

Community Name: **BLACK GUM SWAMP**
 Community ELCODE: CP1B2A0000
 SRANK: S2
 Tracked: Yes



Concept: Forested acidic basin swamps with accumulations of peat. Black gum is the dominant canopy tree.

Environmental setting: Black gum swamps are forested hummocky peatlands that occur in poorly-drained basins. There can be small areas of seepage, usually at the edges of the basin, where seepage indicator plants such as black ash and bugleweed, occur. pH is strongly acidic and ranges from 3-5. More information is needed.

Vegetation Description: Black gum swamps have pronounced hummock-hollow topography, and woody vegetation is confined to the hummocks. The canopy is open, often in the 25-50% cover range. Black gum (*Nyssa sylvatica*) dominates the canopy, but red maple (*Acer rubrum*) and Eastern hemlock (*Tsuga canadensis*) are also abundant. Yellow birch (*Betula alleghaniensis*), white pine (*Pinus strobus*), red spruce (*Picea rubens*), and black ash (*Fraxinus nigra*) may also be common. The shrub layer is well-developed; typical species include common winterberry (*Ilex verticillata*), smooth winterberry (*Ilex laevigata*), mountain-laurel (*Kalmia latifolia*), common mountain-holly (*Nemopanthes mucronatus*), highbush blueberry (*Vaccinium corymbosum*), and wild raisin (*Viburnum nudum* var. *cassinoides*). Herbaceous species occur on the hummocks and include cinnamon fern (*Osmunda cinnamomea*), beggar-ticks (*Bidens frondosa*), goldthread (*Coptis trifolia* ssp. *groenlandica*), northern water-horehound (*Lycopus uniflorus*), swamp-dewberry (*Rubus hispidus*), marsh St. John's-wort (*Triadenum virginicum*), and Massachusetts fern (*Thelypteris simulata*). Wet hollows are typically lined with sedges including silvery bog-sedge (*Carex canescens* ssp. *arctiformis*), bladder-sedge (*Carex intumescens*), tussock-sedge (*Carex stricta*), and three-seeded bog sedge (*Carex trisperma*).

Associations: No associations have been described in Massachusetts.

Habitat values for Associated Fauna: Black gum swamps can function as vernal pool habitat if water remains standing for 2-3 months and they lack fish; these areas provide important amphibian breeding habitat.

Associated rare plants:

Associated rare animals:

CLEMMYS GUTTATA	SPOTTED TURTLE	SC
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Examples: Satan's Kingdom WMA, Northfield.

Threats: Hydrologic alterations threaten black gum swamps. Selective logging of trees other than black gum may have allowed the relative abundance of black gum to increase. More information is needed.

Management needs: More information is needed to assess the management needs for black gum swamps.

Inventory need rank: 2

Inventory comments:

Synonyms:

USNVC/TNC: Acer rubrum-Nyssa sylvatica-Betula alleghaniensis/Sphagnum spp. Forest [CEGL006014].

MA [old name]: Southern New England basin swamp, black gum association [CP2B2A1B00]; Southern New England acidic seepage swamp, black gum swamp [CP3B2A1B00].

ME: not described.

VT: Red maple-black gum swamp.

NH: Black gum-red maple basin swamp.

NY: not described.

CT: Acer rubrum-Nyssa sylvatica / Clethra alnifolia community.

RI: not described.

Golet & Larson, 1974: Deciduous wooded swamp (WS-1).

Other:

Author: J. Kearsley **Date:** 7/21/99

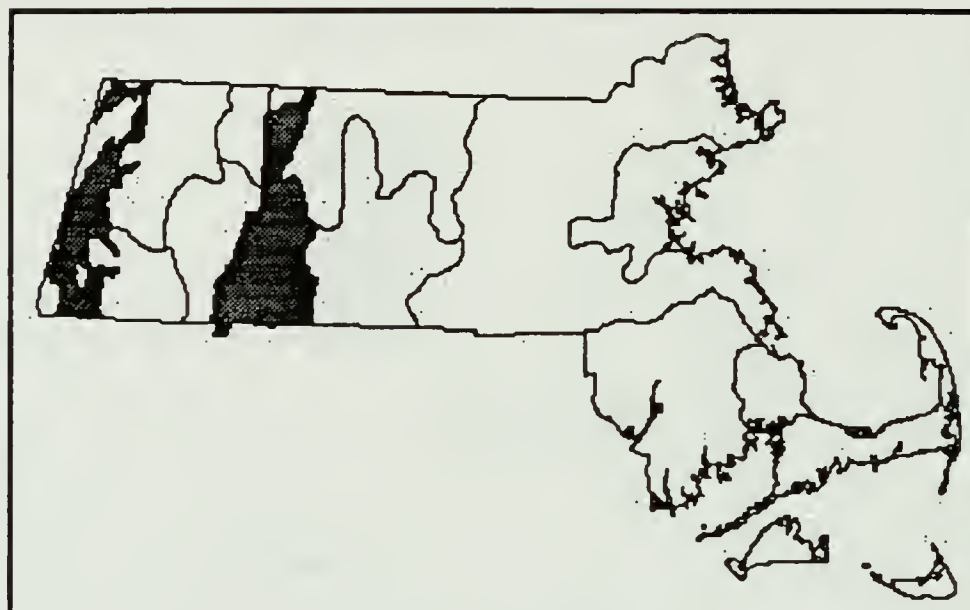
Community Name:
Community ELCODE:
SRANK:
Tracked:

MAJOR-RIVER FLOODPLAIN FOREST

CP1A2B1000

S2

Yes



Concept:

Silver maple-dominated forest community of alluvial floodplains of the Connecticut, Deerfield and Housatonic Rivers.

Environmental setting:

Major-river floodplain forests are known to occur along mainstem sections of large rivers, such as the Connecticut, Housatonic, and Deerfield Rivers in Massachusetts. Soils are predominantly sandy loams without soil mottles and without a surface organic layer. Flooding at these sites occurs annually and is usually severe. An island variant of major-river floodplain forests [Type I in Kearsley, 1998] occurs on elevated sections of riverine islands and riverbanks of major rivers where there are high levels of both natural and human disturbance.

Vegetation Description:

Major-river floodplain forests have silver maple (*Acer saccharinum*) strongly dominant in the overstory, with over 60% cover, mixed with lesser amounts of cottonwood (*Populus deltoides*). American elm (*Ulmus americana*) and/or slippery elm (*U. rubra*) occur in the subcanopy. Shrubs are generally lacking. The herbaceous layer is usually dominated by a 3-6 ft. [1-2 m] tall, dense cover of wood-nettles (*Laportea canadensis*). Ostrich fern (*Matteuccia struthiopteris*) is sometimes abundant. Whitegrass (*Leersia virginica*) is consistently represented, but in low amounts, typically <5% cover. Other common associates are woodreed (*Cinna arundinacea*) and jack-in-the-pulpit (*Arisaema triphyllum*). An island variant of major-river floodplain forests [Type I in Kearsley, 1998] has similar species, but silver maple is not dominant in the overstory and the herbaceous layer is typically strongly dominated by ostrich fern. The overstory is an even mix of silver maple, cottonwood, sycamore (*Platanus occidentalis*), and American ash (*Fraxinus americana*), with box elder (*Acer negundo*) and hackberry (*Celtis occidentalis*; on the Housatonic River) common in the subcanopy. Species typical of disturbed areas, such as staghorn sumac (*Rhus typhina*) and bittersweet (*Celastrus orbiculata*), are also common in this variant, as are the vines, riverbank grape (*Vitis riparia*) and Virginia creeper (*Parthenocissus quinquefolia*).

Associations:

Two associations were described in Kearsley (1998). They are: Type I- Riverine island floodplain forests (*Acer saccharinum*-*Populus deltoides*-*Acer negundo*-*Matteuccia struthiopteris* Association), and Type II-Major-river floodplain forests (*A. saccharinum*-*P. deltoides*-*Laportea canadensis* Association).

Habitat values for Associated Fauna:

Floodplain forests are insect-rich habitats that attract warblers, thrushes and other songbirds. In particular yellow-throated and warbling vireos, which like to nest in the canopies of riverside trees, are frequently observed in floodplain forest communities. Raptors such as bald eagles and red-shouldered hawks also use riverbank trees as perch sites. In spring floods, wood ducks and hooded mergansers like the shady edges of floodplain forests and the interior meander scar pools. Eastern comma butterflies feed on elm and nettles, and the shady riverbanks are patrolled by several dragonfly species such as beaked and fawn darners. Interior meander scars and sloughs function as vernal pools providing breeding habitat for many frog species, such as leopard and pickerel frogs, American toads, and mole salamanders. Floodplain forests also provide sheltered, riverside corridors for deer and migratory songbirds.

Associated rare plants:

MENISPERMUM CANADENSE	MOONSEED	- WL
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Associated rare animals:

CLEMMYS INSCULPTA	WOOD TURTLE	SC
DESMOCERUS PALLIATUS	ELDERBERRY LONG-HORNED BEETLE	SC
GOMPHUS FRATERNUS	MIDLAND CLUBTAIL	E
GOMPHUS VASTUS	COBRA CLUBTAIL	SC
GOMPHUS VENTRICOSUS	SKILLET CLUBTAIL	SC
HALIAEETUS LEUCOCEPHALUS	BALD EAGLE	E
NEUROCORDULIA OBSOLETA	UMBER SHADOWDRAGON	SC
OPHIOGOMPHUS ASPERSUS	BROOK SNAKETAIL	SC
OPHIOGOMPHUS CAROLUS	RIFFLE SNAKETAIL	T
POMATIOPSIS LAPIDARIA	RIVERBANK LOOPING SNAIL	E
SOMATOCHLORA CINGULATA	LAKE EMERALD	SC
SOMATOCHLORA ELONGATA	SKI-TAILED EMERALD	SC
SOMATOCHLORA GEORGIANA	COPPERY EMERALD	E
SOMATOCHLORA KENNEDYI	KENNEDY'S EMERALD	E
SOMATOCHLORA LINEARIS	MOCHA EMERALD	SC
STYLURUS AMNICOLA	RIVERINE CLUBTAIL	E
STYLURUS SCUDDERI	ZEBRA CLUBTAIL	E
STYLURUS SPINICEPS	A CLUBTAIL DRAGONFLY	T

Examples: Fannie Stebbins, East Longmeadow, Rainbow Beach, Northampton.

Threats: Current threats include alteration of natural hydrology through damming, loss of vegetated buffer, disturbance by trail cutting and the subsequent invasion of non-native plant species. In a 1997 statewide floodplain forest community inventory, non-native plant species were observed at all floodplain forest sites surveyed, but they appeared to be localized to areas where the canopy was opened, the herbaceous layer was cleared, and the soil was disturbed. Non-native plant species were most abundant in the island variant of major-river floodplain forests that are heavily used by campers and boaters for recreation. Japanese knotweed (*Polygonum cuspidatum*) currently poses the greatest threat to major-river floodplain forests because of its ability to spread rapidly and shade out all other herbaceous plants.

Management needs: The natural hydrologic regime that created these special communities and their natural closed-canopy forest structure must be maintained. There are no truly effective ways to eradicate Japanese knotweed once it has established. The best way to avoid its spread is to prevent its establishment by avoiding all clearing and disturbance within floodplain forest areas, particularly on the sandier banks.

Inventory need rank: 3

Inventory comments: Inventory and vegetation classification completed by Jennifer Kearsley in 1997.

Synonyms:

USNVC/TNC: *Acer saccharinum*-*Populus deltoides*/Matteuccia struthiopteris Forest [CEGL006147].

MA [old name]: Southern New England floodplain forest [CT2B1A0000].

ME: Hardwood floodplain forest community.

VT: Silver maple-ostrich fern riverine floodplain forest.

NH: Silver maple/wood nettle-ostrich fern floodplain forest.

NY: Floodplain forest.

CT: *Acer saccharinum*-*Populus deltoides* forests; *Acer saccharinum*/ *Eupatorium rugosum* community.

RI: Maple-sycamore floodplain forest.

Golet & Larson, 1974: Deciduous wooded swamp (WS-1).

Author: J. Kearsley

Date: 7/21/99

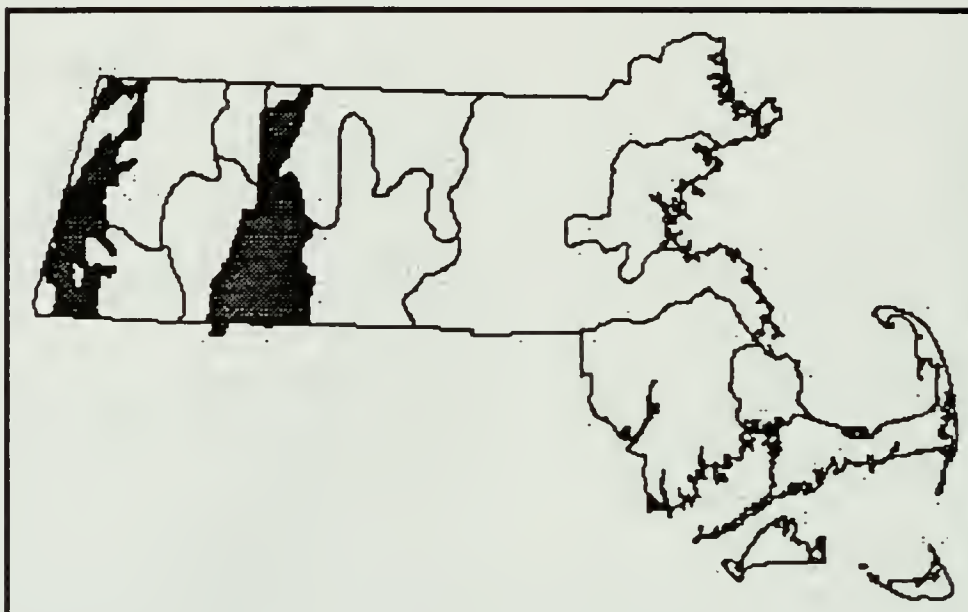
Community Name:
Community ELCODE:
SRANK:
Tracked:

TRANSITIONAL FLOODPLAIN FOREST

CP1A2B2000

S2

Yes



Concept: Silver maple-green ash-American elm forests occurring on alluvial soils. Transitional floodplain forests are intermediate in vegetation composition and soils between major- and small-river types.

Environmental setting: Transitional floodplain forests are known to occur on third-order or smaller tributaries of the Connecticut River, on portions of the Housatonic River, and in depressions within major-river floodplain forests of the Connecticut and Deerfield Rivers. Sites generally experience annual flooding. The severity of flooding, soil texture, and soil drainage of transitional floodplain forests is intermediate between major-river and small-river floodplain forests. Soils are either silt loams or very fine sand y loams, and soil mottling is generally present within 60 cm [2 ft.] of soil surface. A surface organic layer is typically absent.

Vegetation Description: Transitional floodplain forests have a vegetation association intermediate between major-river and small-river floodplain forests. Silver maple (*Acer saccharinum*) is dominant in the canopy, but unlike in major-river forests, cottonwood (*Populus deltoides*) is typically absent. Similar to small-river forests, green ash (*Fraxinus pennsylvanica*) and American elm (*Ulmus americana*) are present. A shrub layer is generally lacking; however, saplings of overstory trees are common. Vines are abundant with hog peanut (*Amphicarpaea bracteata*) most common. Wood-nettle (*Laportea canadensis*) is not dominant, but it is present in low amounts, about 5-15% cover. The herbaceous layer is typically an even mixture of wood-nettle, ostrich fern (*Matteuccia struthiopteris*), sensitive fern (*Onoclea sensibilis*), and false nettle (*Boehmeria cylindrica*).

Associations: One association was described in Kearsley (1998): Type III-Transitional floodplain forests (*A. saccharinum*-*Arisaema dracontium* Association).

Habitat values for Associated Fauna: Transitional floodplain forests often contain meander scars or sloughs that can function as vernal pools and provide important amphibian breeding habitat.

Associated rare plants:

ARISAEMA DRACONTIUM	GREEN DRAGON	T
CAREX GRAYI	GRAY'S SEDGE	T
CAREX TYPHINA	CAT-TAIL SEDGE	T
MENISPERMUM CANADENSE	MOONSEED	- WL

Associated rare animals:

AMBYSTOMA JEFFERSONIANUM	JEFFERSON SALAMAND ER	SC
AMBYSTOMA LATERALE	BLUE-SPOTTED SALAMAND ER	SC
CLEMMYS GUTTATA	SPOTTED TURTLE	SC

CLEMMYS INSCULPTA	WOOD TURTLE	SC
GOMPHUS FRATERNUS	MIDLAND CLUBTAIL	E
GOMPHUS VASTUS	COBRA CLUBTAIL	SC
GOMPHUS VENTRICOSUS	SKILLET CLUBTAIL	SC
HEMIDACTYLUM SCUTATUM	FOUR-TOED SALAMAND ER	SC
NEUROCORDULIA OBSOLETA	UMBER SHADOWDRAGON	SC
OPHIOGOMPHUS ASPERSUS	BROOK SNAKETAIL	SC
OPHIOGOMPHUS CAROLUS	RIFFLE SNAKETAIL	T
SOMATOCHLORA CINGULATA	LAKE EMERALD	SC
SOMATOCHLORA ELONGATA	SKI-TAILED EMERALD	SC
SOMATOCHLORA GEORGIANA	COPPERY EMERALD	E
SOMATOCHLORA GEORGIANA	COPPERY EMERALD	E
SOMATOCHLORA KENNEDYI	KENNEDY'S EMERALD	E
SOMATOCHLORA LINEARIS	MOCHA EMERALD	SC
STYLURUS AMNICOLA	RIVERINE CLUBTAIL	E
STYLURUS SCUDDERI	ZEBRA CLUBTAIL	E
STYLURUS SPINICEPS	A CLUBTAIL DRAGONFLY	T

Examples: lower Mill River, Hatfield; lower Sawmill River, Montague.

Threats: Threats are similar to those for major-river floodplain forests. Non-native plant species can be abundant in disturbed, open areas. The most common non-native plant species are moneywort (*Lysimachia nummularia*), forget-me-not (*Myosotis scorpioides*), and glossy buckthorn (*Rhamnus frangula*).

Management needs: All efforts should be made to mechanically remove non-native plant species and to prevent further clearing.

Inventory need rank: 3

Inventory comments: Inventory and vegetation classification completed by Jennifer Kearsley in 1997.

Synonyms:

USNVC/TNC: similar to Acer saccharinum-Ulmus americana/Onoclea sensibilis Forest [CEGL006001].

MA [old name]: Southern New England floodplain forest [CT2B1A0000].

ME: Hardwood floodplain forest community.

VT: may be included within Silver maple-sensitive fern-false nettle riverine floodplain forest.

NH: may be included within Silver maple/false nettle-wood reed-sedge floodplain forest.

NY: Floodplain forest.

CT: similar to Acer saccharinum/Onoclea sensibilis community [Matteuccia struthiopteris variant].

RI: Maple-sycamore floodplain forest.

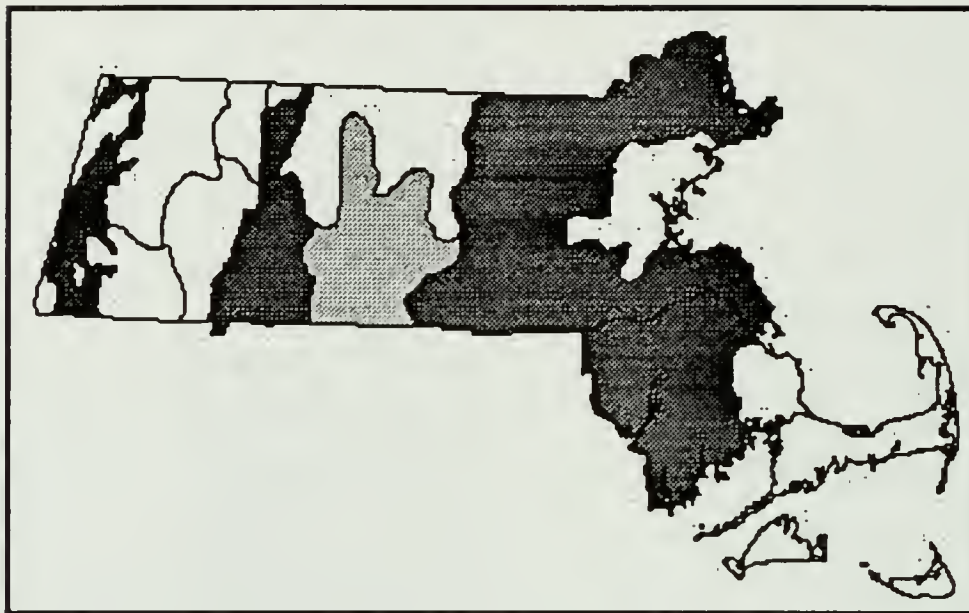
Golet & Larson, 1974: Deciduous wooded swamp (WS-1).

Other:

Author: J. Kearsley **Date:** 7/21/99

Community Name:
Community ELCODE:
SRANK:
Tracked:

SMALL-RIVER FLOODPLAIN FOREST
CP1A2B3000
S2
Yes



Concept: Silver maple/green ash-dominated forests occurring on alluvial soils of small rivers and streams.

Environmental setting: Small-river floodplain forests are known to occur on third-order or smaller tributaries of the Connecticut and Nashua Rivers, on small rivers of eastern Massachusetts where banks are low and overbank flooding occurs, such as the Ipswich, Assabet, Concord, Shawsheen, and Three Mile Rivers, and on edges of riverine islands of the Merrimack River. Annual flooding occurs, but the water volume and degree of scour are much less than in major-river floodplain forests. Soils are hydric silt loams and fine sandy loams with soil mottling within the top 60 cm [2 ft.] and sometimes with a surface organic layer.

Vegetation Description: As in major-river and transitional floodplain forest types, silver maple (*Acer saccharinum*) is dominant in the overstory of small-river floodplain forests, but the understory more closely resembles that of red maple-alluvial swamp forests. Cottonwood (*Populus deltoides*) and red maple (*Acer rubrum*) are both typically absent in the canopy of small-river floodplain forest communities. Pin oak (*Quercus palustris*) is a common canopy associate in the Connecticut River basin, and river birch (*Betula nigra*) in the Merrimack River basin. Small-river floodplain forests have a more substantial shrub layer than both major-river and transitional types, but less than alluvial swamp forests. The shrub layer consists mainly of silky dogwood (*Cornus amomum*) and buttonbush (*Cephalanthus occidentalis*). There is greater herbaceous plant diversity in small-river floodplain forests than in major-river and transitional types. Sensitive fern (*Onoclea sensibilis*) and false nettle (*Boehmeria cylindrica*) are most common, and associates include the moisture-loving plants, water hemlock (*Cicuta maculata*), swamp candles (*Lysimachia terrestris*), and water parsnip (*Sium suave*).

Associations: One association was described in Kearsley (1998): Type IV-Small-river floodplain forests (*Acersaccharinum-Fraxinus pennsylvanica-Quercus palustris* Association).

Habitat values for Associated Fauna: Small-river floodplain forests often contain meander scars or backwater sloughs that function as vernal pools and provide important amphibian breeding habitat.

Associated rare plants:

ARISAEMA DRACONTIUM	GREEN DRAGON	T
BETULA NIGRA	RIVER BIRCH	- WL
CAREX GRAYI	GRAY'S SEDGE	T
CAREX TYPHINA	CAT-TAIL SEDGE	T
CLAYTONIA VIRGINICA	NARROW-LEAVED SPRING BEAUTY	T
MENISPERMUM CANADENSE	MOONSEED	- WL
MIMULUS ALATUS	WINGED MONKEY-FLOWER	E
RUMEX VERTICILLATUS	SWAMP DOCK	T

Associated rare animals:

AMBYSTOMA JEFFERSONIANUM	JEFFERSON SALAMAND ER	SC
AMBYSTOMA LATERALE	BLUE-SPOTTED SALAMAND ER	SC
CINCINNATIA WINKLEYI	NEW ENGLAND SILTSNAIL	SC
CLEMMYS GUTTATA	SPOTTED TURTLE	SC
CLEMMYS INSCULPTA	WOOD TURTLE	SC
EMYDOIDEA BLAND INGII	BLAND ING'S TURTLE	T
GOMPHUS FRATERNUS	MIDLAND CLUBTAIL	E
GOMPHUS VASTUS	COBRA CLUBTAIL	SC
GOMPHUS VENTRICOSUS	SKILLET CLUBTAIL	SC
HEMIDACTYLIUM SCUTATUM	FOUR-TOED SALAMAND ER	SC
NEUROCORDULIA OBSOLETA	UMBER SHADOWDRAGON	SC
OPHIOGOMPHUS ASPERSUS	BROOK SNAKETAIL	SC
OPHIOGOMPHUS CAROLUS	RIFFLE SNAKETAIL	T
SOMATOCHLORA CINGULATA	LAKE EMERALD	SC
SOMATOCHLORA ELONGATA	SKI-TAILED EMERALD	SC
SOMATOCHLORA GEORGIANA	COPPERY EMERALD	E
SOMATOCHLORA GEORGIANA	COPPERY EMERALD	E
SOMATOCHLORA KENNEDYI	KENNEDY'S EMERALD	E
SOMATOCHLORA LINEARIS	MOCHA EMERALD	SC
STYLURUS AMNICOLA	RIVERINE CLUBTAIL	E
STYLURUS SCUDDERI	ZEBRA CLUBTAIL	E
STYLURUS SPINICEPS	A CLUBTAIL DRAGONFLY	T

Examples: small tributaries of the Connecticut River, South Hadley.

Threats: The non-native plant species, moneywort (*Lysimachia nummularia*), forget-me-not (*Myosotis scorpioides*), and glossy buckthorn (*Rhamnus frangula*), are most prevalent in small-river and transitional floodplain forest types, especially in disturbed areas.

Management needs: Removal of non-native plants is needed, especially in areas where they are competing with state-protected rare species.

Inventory need rank: 3

Inventory comments: Inventory and vegetation classification completed by Jennifer Kearsley in 1997.

Synonyms:

USNVC/TNC: similar to *Quercus palustris*-*Acer rubrum*/*Carex grayi*-*Geum canadense* forest [CEGL006185] and to *Acer saccharinum*/*Boehmeria cylindrica* forest [CEGL006176].

MA [old name]: Southern New England floodplain forest [CT2B1A0000].

ME: Hardwood floodplain forest community.

VT: Silver maple-sensitive fern-false nettle riverine floodplain forest.

NH: Silver maple/false nettle-wood reed-sedge floodplain forest.

NY: Floodplain forest.

CT: *Acer saccharinum*/*Boehmeria cylindrica* community, *Quercus palustris*-*Fraxinus pennsylvanica* forests.

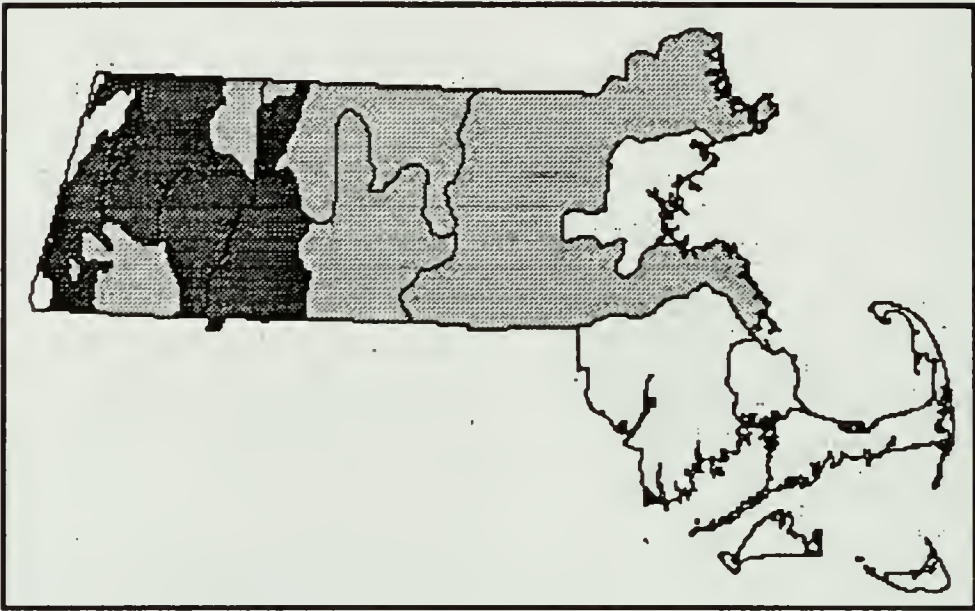
RI: similar to both the Maple-sycamore floodplain forest and the Red maple-pin oak floodplain forest.

Golet & Larson, 1974: Deciduous wooded swamp (WS-1).

Author: J. Kearsley

Date: 7/21/99

Community Name:	HIGH-TERRACE FLOODPLAIN FOREST
Community ELCODE:	CP1A2B4000
SRANK:	S2
Tracked:	Yes



Concept:	Mesic, deciduous hardwood forests of high alluvial terraces above the zone of annual flooding. This community type also occurs along riverbanks of high-gradient, northern rivers.	
Environmental setting:	High-terrace floodplain forests occur on raised banks adjacent to rivers and streams, on steep banks bordering high-gradient rivers in the western parts of the state, on high alluvial terraces, and on raised areas within major-river and small-river floodplain forests. They are river-influenced and mesic, but they typically are not flooded annually as indicated by the presence of a distinct surface, soil organic layer. Soils are typically silt loams.	
Vegetation Description:	The canopy is a mixture of floodplain taxa, such as red and silver maple (<i>Acer rubrum</i> and <i>A. saccharinum</i>), and mesic, deciduous hardwoods including sugar maple (<i>A. saccharum</i>), shagbark hickory (<i>Carya ovata</i>), black cherry (<i>Prunus serotina</i>), American elm (<i>Ulmus americana</i>), and basswood (<i>Tilia americana</i>). Ironwood (<i>Carpinus caroliniana</i>) typically forms an open subcanopy and is a good indicator species of this community type. The shrub layer varies from sparse to well-developed with arrowwood (<i>Viburnum dentatum</i>), nannyberry (<i>Viburnum lentago</i>), and winterberry (<i>Ilex verticillata</i>) most common mixed with variable amounts of non-native shrubs, including Japanese barberry (<i>Berberis thunbergii</i>) and buckthorn (<i>Rhamnus frangula</i> , <i>R. cathartica</i>). The herbaceous layer is a mixture of the characteristic floodplain forest ferns—sensitive fern (<i>Onoclea sensibilis</i>) and ostrich fern (<i>Matteuccia struthiopteris</i>)—and rich upland herbs, such as Canada mayflower (<i>Maianthemum canadense</i>), lady fern (<i>Athyrium filix-femina</i>), zigzag goldenrod (<i>Solidago flexicaulis</i>), white snakeroot (<i>Eupatorium rugosum</i>), jack-in-the-pulpit (<i>Arisaema triphyllum</i>) and bellwort (<i>Uvularia sessilifolia</i>). Other characteristic herbaceous taxa include honewort (<i>Cryptotaenia canadensis</i>), bottlebrush grass (<i>Hystrix patula</i>), floodplain avens (<i>Geum laciniatum</i>), jumpseed (<i>Tovara virginianum</i>), Wiegand's wild rye (<i>Elymus wiegandii</i>), trilliums (<i>Trillium</i> spp.), trout-lily (<i>Erythronium americanum</i>), and enchanter's nightshade (<i>Circaea lutetiana</i> ssp. <i>canadensis</i>). Virginia creeper (<i>Parthenocissus quinquefolia</i>) and poison ivy (<i>Toxicodendron radicans</i>) can also be abundant.	
Associations:	One association was described in Kearsley (1998): Type VI-Alluvial terrace forests (<i>Acer. rubrum</i> - <i>Carya ovata</i> - <i>Prunus serotina</i> Association).	
Habitat values for Associated Fauna:	High-terrace floodplain forests can contain low wet depressions that function as vernal pools and provide important amphibian breeding habitat.	
Associated rare plants:		
ACER NIGRUM	BLACK MAPLE	SC
CLAYTONIA VIRGINICA	NARROW-LEAVED SPRING BEAUTY	T
WALDSTEINIA FRAGARIOIDES	BARREN STRAWBERRY	SC

Associated rare animals:

AMBYSTOMA JEFFERSONIANUM	JEFFERSON SALAMAND ER	SC
AMBYSTOMA LATERALE	BLUE-SPOTTED SALAMAND ER	SC
CLEMMYS GUTTATA	SPOTTED TURTLE	SC
CLEMMYS INSCULPTA	WOOD TURTLE	SC
EMYDOIDEA BLAND INGI	BLAND ING'S TURTLE	T
HEMIDACTYLUM SCUTATUM	FOUR-TOED SALAMAND ER	SC

Examples: Mill River, Northampton.

Threats: Most high terraces have been converted to agriculture. Remaining examples are typically small and disturbed by selective logging and trail clearing. The lack of natural vegetated buffers make these communities highly susceptible to non-native plant invasions. Most known examples have non-native plant species comprising a substantial percentage of overall plant cover. Because these communities fall outside of wetland boundaries, they are not subject to wetland regulations making them targets for selective logging and clearing for agriculture.

Management needs: Removal of non-native species.

Inventory need rank: 1

Inventory comments: Highly fragmented community. Needs statewide inventory.

Synonyms:

USNVC/TNC: Acer saccharum/Hydrophyllum virginianum-Tovara virginiana Forest [CEGL006114].

MA [old name]: SNE Riverside/streamside mesic, deciduous forest [CT2F1A0000].

ME: included in Hardwood floodplain forest community.

VT: Sugar maple-basswood-ostrich fern riverine floodplain forest.

NH: Sugar Maple-Silver Maple-White Ash Floodplain Forest.

NY: included in Floodplain forest.

CT: Acer saccharum-Fraxinus americana/Carex sprengei community.

RI: not described.

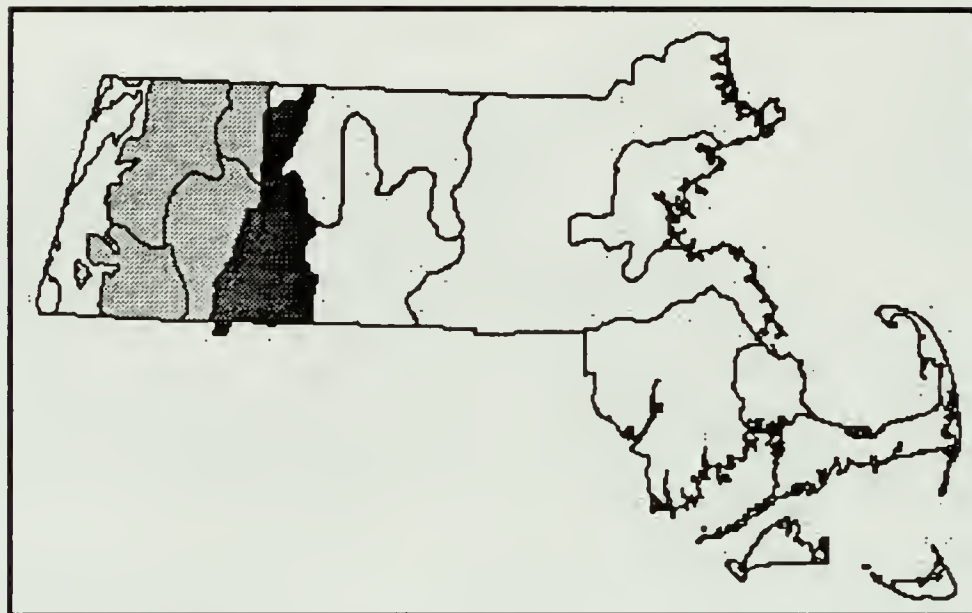
Golet & Larson, 1974:

Other:

Author: J. Kearsley

Date: 7/21/99

Community Name: **COBBLE BAR FOREST**
Community ELCODE: CP1A2B5000
SRANK: S2
Tracked: Yes



- Concept:** A variant of high-energy riverbanks characterized by open forests dominated by stunted sycamores and cottonwoods growing on sandy cobble bars.
- Environmental setting:** Cobble bar forests are limited to cobble substrates that are deposited by high-energy rivers. They are more severely flooded and scoured than floodplain forests. More information is needed on the environmental setting and hydrologic regime of cobble bar forests.
- Vegetation Description:** Open canopy forests dominated by sycamore (*Platanus occidentalis*) with associated cottonwood (*Populus deltoides*) and silver maple (*Acer saccharinum*). American elm (*Ulmus americana*) occurs in the subcanopy. Trees are generally younger than in other floodplain forest communities. More information is needed on this community type. In known examples on the Westfield River, exotic species are abundant in the understory. Most common are multiflora rose (*Rosa multiflora*), various exotic shrubby honeysuckles (*Lonicera* spp.), Oriental bittersweet (*Celastrus orbiculata*), and Japanese knotweed (*Polygonum cuspidatum*). Herbaceous species occur in the interstitial sand/silt between cobbles. Typical species include sensitive fern (*Onoclea sensibilis*), false Solomon's seal (*Maianthemum racemosum*), and horsetails (*Equisetum* spp.). Poison ivy (*Toxicodendron radicans*) and Virginia creeper (*Parthenocissus quinquefolia*) can be abundant. More information is needed.
- Associations:** No associations have been described in Massachusetts.
- Habitat values for Associated Fauna:** Provide habitat for riverine odonates.

Associated rare plants:

NONE KNOWN

Associated rare animals:

CICINDELA DUODECIMGUTTATA	TWELVE-SPOTTED TIGER BEETLE	SC
GOMPHUS FRATERNUS	MIDLAND CLUBTAIL	E
GOMPHUS VASTUS	COBRA CLUBTAIL	SC
GOMPHUS VENTRICOSUS	SKILLET CLUBTAIL	SC
NEUROCORDULIA OBSOLETA	UMBER SHADOWDRAGON	SC
OPHIOGOMPHUS ASPERSUS	BROOK SNAKETAIL	SC
OPHIOGOMPHUS CAROLUS	RIFFLE SNAKETAIL	T
SOMATOCHLORA CINGULATA	LAKE EMERALD	SC

SOMATOCHLORA ELONGATA	SKI-TAILED EMERALD	SC
SOMATOCHLORA GEORGIANA	COPPERY EMERALD	E
SOMATOCHLORA KENNEDYI	KENNEDY'S EMERALD	E
SOMATOCHLORA LINEARIS	MOCHA EMERALD	SC
STYLURUS AMNICOLA	RIVERINE CLUBTAIL	E
STYLURUS SCUDDERI	ZEBRA CLUBTAIL	E
STYLURUS SPINICEPS	A CLUBTAIL DRAGONFLY	T

Examples: lower Westfield River, Westfield.

Threats: This is a high disturbance habitat and non-native taxa are abundant.

Management needs: Maintenance of normal flooding intensity is needed to maintain community.

Inventory need rank: 2

Inventory comments: Inventory cobble bars of high-energy rivers—Connecticut, Deerfield, Westfield, Farmington. Need to decide if this should be tracked as its own community type or included as variant of major-river floodplain forests or high-energy riverbanks.

Synonyms:

USNVC/TNC: not described.

MA [old name]: included within Southern New England high-energy riverbank community [CT1E2A2000].

ME: not described.

VT: Successional riverine floodplain forest.

NH: not described.

NY: not described.

CT: may fall within Platanus occidentalis-Acer negundo forests heading but no communities have been described.

RI: not described.

Golet & Larson, 1974:

Other:

Author: J. Kearsley **Date:** 7/21/99

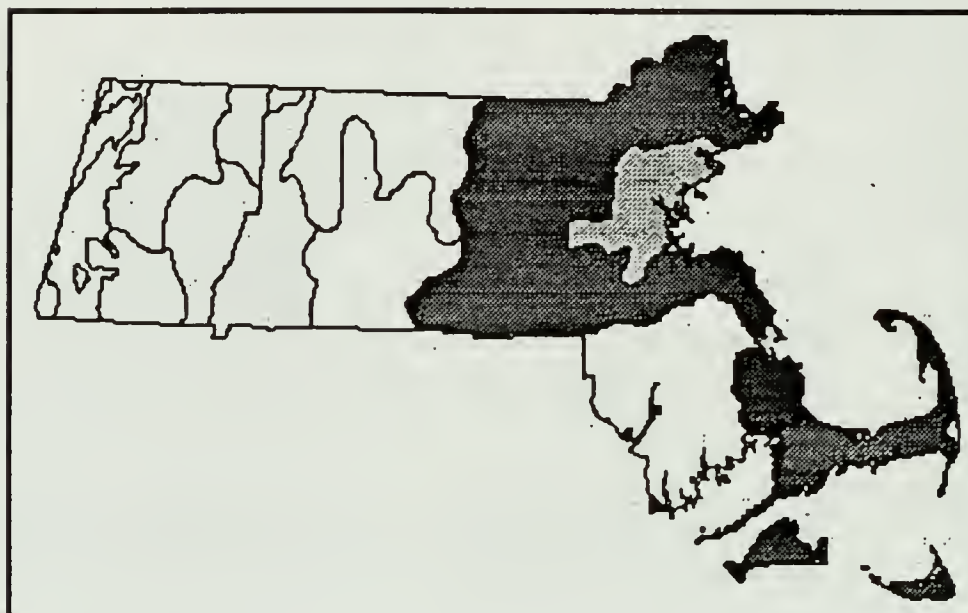
Community Name:
Community ELCODE:
SRANK:
Tracked:

COASTAL INTERDUNAL MARSH / SWALE

CP2A0A1100

S1

Yes



Concept:

Graminoid- or shrub-dominated coastal community occurring in shallow basins (*swales*) between sand dunes.

Environmental setting:

Interdunal swales are low, shallow depressions that form between sand dunes along the coast. They occur as part of a dune system, and the best examples are complexes of numerous swales. Soils generally have a thin, about 1 cm, organic layer over coarse sand. The water regime ranges from seasonally flooded to permanently inundated.

Vegetation Description:

Interdunal swales range from unvegetated pools to graminoid-dominated to low shrub-dominated communities. The most common type is a low shrub community dominated by large cranberry (*Vaccinium macrocarpon*; often with greater than 90% cover) with lesser amounts of bayberry (*Myrica pensylvanica*). Typical associates include various rushes (*Juncus pelocarpus*, *J. canadensis*, etc.), spatulate-leaved and thread-leaved sundews (*Drosera intermedia* and *D. filiformis*), beak sedges (*Rhynchospora capitellata* and *R. alba*), yellow-eyed grasses (*Xyris* spp.), St. John's-worts (*Hypericum* spp.), southern bog clubmoss (*Lycopodium adpressum*), and several orchid species such as rose pogonia (*Pogonia ophioglossoides*), grass-pink (*Calopogon pulchellus*), and nodding ladies'-tresses (*Spiranthes cernua*). Arethusa (*Arethusa bulbosa*) and ragged fringed orchis (*Platanthera lacera*) are two orchid species that occur occasionally. Graminoid-dominated swales are characterized by a mixture of rushes (*Juncus* spp.), beak-sedges (*Rhynchospora* spp.) and other graminoids. Some interdunal swales have large numbers of Plymouth gentian (*Sabatia kennedyana*). Scattered pitch pine (*Pinus rigida*) and sheep laurel (*Kalmia angustifolia*) can also occur.

Associations:

The coastal interdunal marsh/swale community includes the six interdunal swale vegetation associations that have been described for Massachusetts [Lundgren, 1998]. Those associations are: *Myrica pensylvanica*-*Vaccinium macrocarpon* swale; *Vaccinium macrocarpon*-graminoid swale (variants = *V. macrocarpon*-*Scirpus pungens*-*Panicum virgatum* swale; *V. macrocarpon*-*Rhynchospora capitellata* swale); *Juncus* spp. (*J. greenei*, *J. pelocarpus*, *J. canadensis*, *J. balticus*) swale; *Juncus* spp.-(*Cyperus*) swale; *Scirpus pungens*-*Juncus* swale; and *Scirpus pungens*-*Triglochin* brackish swale.

Habitat values for Associated Fauna

Interdunal swales can function as vernal pool habitat if water remains standing for 2-3 months and they lack fish; these swales provide important amphibian breeding habitat, particularly for toads, including American, Fowler's, and spadefoot toads. Interdunal swales have a high habitat value to birds and mammals for food, cover, and nesting sites.

Associated rare plants:

ARETHUSA BULBOSA
DROSERA FILIFORMIS
SABATIA KENNEDYANA

ARETHUSA
THREAD-LEAVED SUNDEW
PLYMOUTH GENTIAN

T
- WL
SC

Associated rare animals:

SCAPHIOPUS HOLBROOKII

EASTERN SPADEFOOT

T

Examples: Sand y Neck, Barnstable.

Threats: Invasion of non-native species, especially phragmites (*Phragmites australis*) and purple loosestrife (*Lythrum salicaria*).

Management needs: Control the spread of phragmites and purple loosestrife.

Inventory need rank: 3

Inventory comments:

Synonyms:

USNVC/TNC: Vaccinium macrocarpon-Myrica pensylvanica dwarf-shrubland [CEGL006141]; Spartina patens seasonally flooded herbaceous vegetation [CEGL006342]

MA [old name]: Coastal interdunal marsh/swale [CP2A2A0000]

ME: not described

VT: not described

NH: coastal interdunal marsh/swale

NY: Maritime interdunal swales

CT: not described

RI: not described

Golet & Larson, 1974: may fall within Compact shrub swamp (SS-3)

Other:

Author: J. Kearsley

Date: 7/21/99

Community Name: **DEEP EMERGENT MARSH**
Community ELCODE: CP2A0A1200
SRANK: S4
Tracked: No



Concept: Tall graminoid/emergent herbaceous wetlands occurring on saturated, mucky mineral soils that are seasonally inundated and permanently saturated

Environmental setting: Deep emergent marshes generally form in broad, flat areas bordering low-energy rivers and streams or along pond and lake margins. The soils are a mixture of organic and mineral components. There is typically a layer of well-decomposed organic muck at the surface overlying mineral soil. There is standing or running water during the growing season and throughout much of the year. Water depth averages between 6 in. and 3 ft. Deep emergent marshes are associated with shrub swamps, and the two communities intergrade.

Vegetation Description: Tall graminoids, like broad-leaved cat-tail (*Typha latifolia*) and phragmites (*Phragmites australis*), often form extensive dense stands. Narrow-leaved cat-tail (*Typha angustifolia*) occurs in more alkaline sites or in saline areas along roads [Weatherbee, 1996]. Other characteristic graminoids include wool-grass (*Scirpus cyperinus*), common threesquare (*Scirpus pungens*), Canada bluejoint (*Calamagrostis canadensis* var. *canadensis*), rice cut-grass (*Leersia oryzoides*), and tussock-sedge (*Carex stricta*). Herbaceous associates include arrow-leaf tearthumb (*Polygonum sagittatum*), bulblet water-hemlock (*Cicuta bulbifera*), swamp-candles (*Lysimachia terrestris*), beggar-ticks (*Bidens* spp.), bedstraw (*Galium* spp.), common arrowhead (*Sagittaria latifolia* var. *latifolia*), slender-leaved goldenrod (*Euthamia tenuifolia*) and marsh-fern (*Thelypteris palustris* var. *pubescens*). Nutrient-rich sites in Berkshire County typically have cat-tails mixed with soft-stemmed bulrush (*Scirpus tabernaemontani*), hard-stemmed bulrush (*S. acutus*), river-horsetail (*Equisetum fluviatile*), marsh-cinquefoil (*Comarum palustre*), sweet-flag (*Acorus calamus*), bristly sedge (*Carex comosa*), lakeside sedge (*C. lacustris*), and giant bur-reed (*Sparganium eurycarpum*) among others [Weatherbee, 1996].

Associations: No associations have been described in Massachusetts.

Habitat values for Associated Fauna: Deep emergent marshes are excellent waterfowl habitat and also provide important habitat for frogs and newts, especially leopard, pickerel, green and bull frogs, and red-spotted newts. Wood frogs may use areas of deep emergent marsh that are fish free.

Associated rare plants:

CAREX ALOPECOIDEA	FOXTAIL SEDGE	T
LUDWIGIA SPHAEROCARPA	ROUND-FRUITED FALSE-LOOSESTRIFE	T
POLYGONUM SETACEUM VAR INTERJECTUM	STRIGOSE KNOTWEED	SC
SCIRPUS FLUVIATILIS	RIVER BULRUSH	SC

Associated rare animals:

ARDEA HERODIAS	GREAT BLUE HERON	- WL
BOTAURUS LENTIGINOSUS	AMERICAN BITTERN	E
CIRCUS CYANEUS	NORTHERN HARRIER	T
CISTOTHORUS PALUSTRIS	MARSH WREN	- WL
CLEMMYS GUTTATA	SPOTTED TURTLE	SC
CLEMMYS INSCULPTA	WOOD TURTLE	SC
EMYDOIDEA BLAND INGII	BLAND ING'S TURTLE	T
GALLINULA CHLOROPUS	COMMON MOORHEN	SC
IXOBRYCHUS EXILIS	LEAST BITTERN	E
PODILYMBUS PODICEPS	PIED-BILLED GREBE	E
RALLUS ELEGANS	KING RAIL	T
SOREX PALUSTRIS	WATER SHREW	SC

Examples: Quinebaug River, Quaboag River WMA

Threats: Deep emergent marshes are threatened by filling and dredging, impoundments that alter natural water-level fluctuations, and nutrient inputs from adjacent roads, fields, or septic systems. Purple loosestrife (*Lythrum salicaria*), an aggressive non-native species, can be abundant in deep emergent marshes throughout the state. Phragmites is also a problem.

Management needs: Removal of purple loosestrife and phragmites.

Inventory need rank: 2

Inventory comments: Statewide inventory of marshes and wet meadows is needed.

Synonyms:

USNVC/TNC: Phalaris arundinacea Eastern Herbaceous Vegetation [CEGL006335]; Phragmites australis semipermanently flooded ruderal herbaceous vegetation [CEGL004141]; Typha (angustifolia, latifolia)-(Scirpus spp.) eastern herbaceous vegetation [CEEGL006153]; Pontederia cordata-Peltandra virginica semipermanently flooded herbaceous vegetation [CEGL004291].

MA [old name]: Southern New England nutrient-poor streamside/lakeside marsh [CP4A2A.0000]; Southern New England nutrient-rich streamside/lakeside marsh [CP4A1A0000].

ME: Cattail marsh community.

VT: Cattail marsh; Deep rush marsh.

NH: Deep emergent marsh.

NY: Deep emergent marsh.

CT: not described.

RI: Semipermanently flooded (deep) emergent marsh.

Golet & Larson, 1974: Robust deep marsh (DM-4); narrow-leaved deep marsh (DM-5); broad-leaved deep marsh (DM-6).

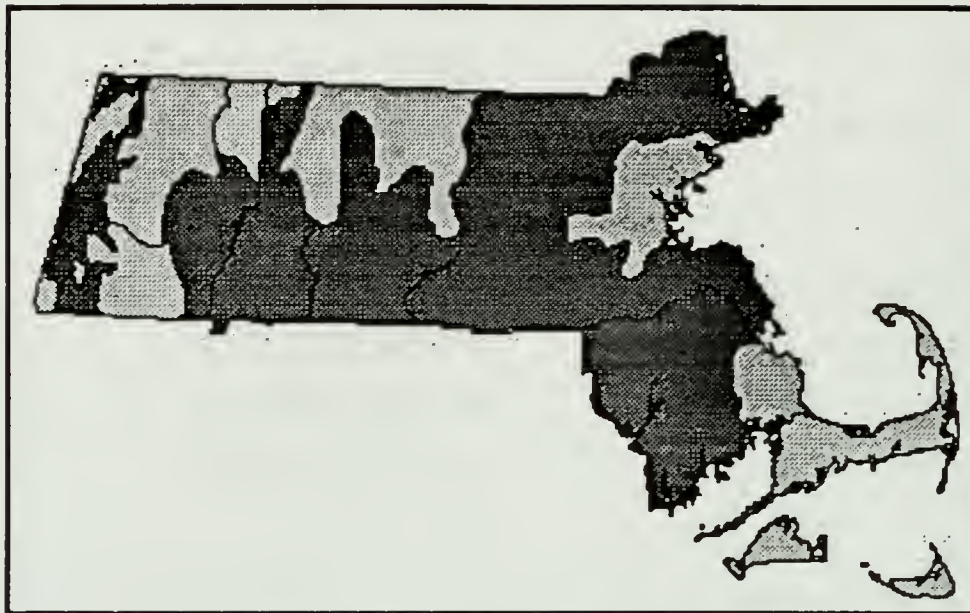
Other: Robust emergent marsh [Weatherbee, 1996].

Author: J. Kearsley

Date: 7/21/99

Community Name:
Community ELCODE:
SRANK:
Tracked:

SHALLOW EMERGENT MARSH
CP2A0A1300
S4
No



Concept: Grass, sedge, and /or rush-dominated wetlands on mucky mineral soils that are seasonally inundated and permanently saturated.

Environmental setting: Shallow emergent marshes occur in similar settings to deep emergent marshes, i.e. in broad, flat areas bordering low-energy rivers and streams, often in backwater sloughs, or along pond and lake margins. Unlike deep emergent marshes, shallow marshes commonly occur in abandoned beaver flowages, and in some states they are named "Abandoned beaver meadows" or "beaver flowage communities." The soils are a mixture of organic and mineral components. There is typically a layer of well-decomposed organic muck at the surface overlying mineral soil. There is standing or running water during the growing season and throughout much of the year, but water depth is less than deep emergent marshes and averages less than 6 in.

Vegetation Description: Vegetation composition is similar to deep emergent marshes except that shorter grasses, sedges and rushes dominate. Cat-tails, phragmites, and wool-grass, the dominants of deep emergent marshes, can occur but are never dominant. Tussock forming species, like tussock sedge (*Carex stricta*) and Canada bluejoint (*Calamagrostis canadensis* var. *canadensis*), often cover broad areas and form a hummock-hollow topography. Reed canary grass (*Phalaris arundinacea*) can also occur. It is common to see tussock sedge-dominated marshes in old beaver flowages mixed with scattered shrubs like alder and spiraea. The shallow water typically has a mixture of bur-reeds (*Sparganium* spp.), sedges (*Carex* spp.), and rice cut-grass (*Leersia oryzoides*). Floating leaved plants, like the water-lilies (*Nymphaea odorata* and *Nuphar* spp.), and submergents, like pondweeds (*Potamogeton* spp.), occur in open areas, and duckweed (*Lemna* spp.) is abundant in still water. Based on species composition alone, it can be difficult to differentiate shallow emergent marshes and wet meadows, but they occur in different physical settings and hydrologic regimes [see concept description for wet meadows. More community data are needed on these communities to determine the indicator species of each.

Associations: No associations have been described in Massachusetts.

Habitat values for Associated Fauna: Shallow emergent marshes are excellent habitat for muskrats. As with deep emergent marshes shallow emergent marshes provide important habitat for frogs and newts.

Associated rare plants:

ELEOCHARIS OBTUSA VAR OVATA	OVATE SPIKE-SEDGE	E
SAGITTARIA CUNEATA	WAPATO	E

Associated rare animals:

BOTAURUS LENTIGINOSUS	AMERICAN BITTERN	E
CIRCUS CYANEUS	NORTHERN HARRIER	T
CISTOTHORUS PALUSTRIS	MARSH WREN	- WL
CLEMMYS GUTTATA	SPOTTED TURTLE	SC
CLEMMYS INSCULPTA	WOOD TURTLE	SC
EMYDOIDEA BLAND INGHII	BLAND INGH'S TURTLE	T
GALLINULA CHLOROPUS	COMMON MOORHEN	SC
IXOBRYCHUS EXILIS	LEAST BITTERN	E
PODILYMBUS PODICEPS	PIED-BILLED GREBE	E
RALLUS ELEGANS	KING RAIL	T
SOREX PALUSTRIS	WATER SHREW	SC

Examples: Nashua River marsh; perimeter of several ponds along Trout Brook; Quaboag River WMA

Threats: Shallow emergent marshes are threatened by filling and dredging, impoundments that alter natural water-level fluctuations, and nutrient inputs from adjacent roads, fields, or septic systems. The invasion and spread of purple loosestrife (*Lythrum salicaria*) alters natural community structure and composition.

Management needs: Efforts are needed to control the spread of purple loosestrife.

Inventory need rank: 2

Inventory comments: Statewide inventory of marshes and wet meadows is needed.

Synonyms:

USNVC/TNC: Carex stricta flooded herbaceous vegetation [CEGL004121]; maybe Scirpus acutus-Carex lasiocarpa herbaceous vegetation [CEGL006358].

MA [old name]: Southern New England nutrient-poor streamside/lakeside marsh [CP4A2A0000]; Southern New England nutrient-rich streamside/lakeside marsh [CP4A1A0000].

ME: Beaver flowage community; sedge meadow community?

VT: Shallow emergent marsh.

NH: Shallow emergent marsh [which they have subdivided into 5 subtypes: reed-grass meadow, tussock sedge meadow, medium sedge meadow, bulrush meadow, short graminoid-forb marsh].

NY: Shallow emergent marsh.

CT: not described.

RI: Seasonally flooded (*shallow*) emergent marsh.

Golet & Larson, 1974: Robust shallow marsh (SM-1); narrow-leaved shallow marsh (SM-2); broad-leaved shallow marsh (SM-3).

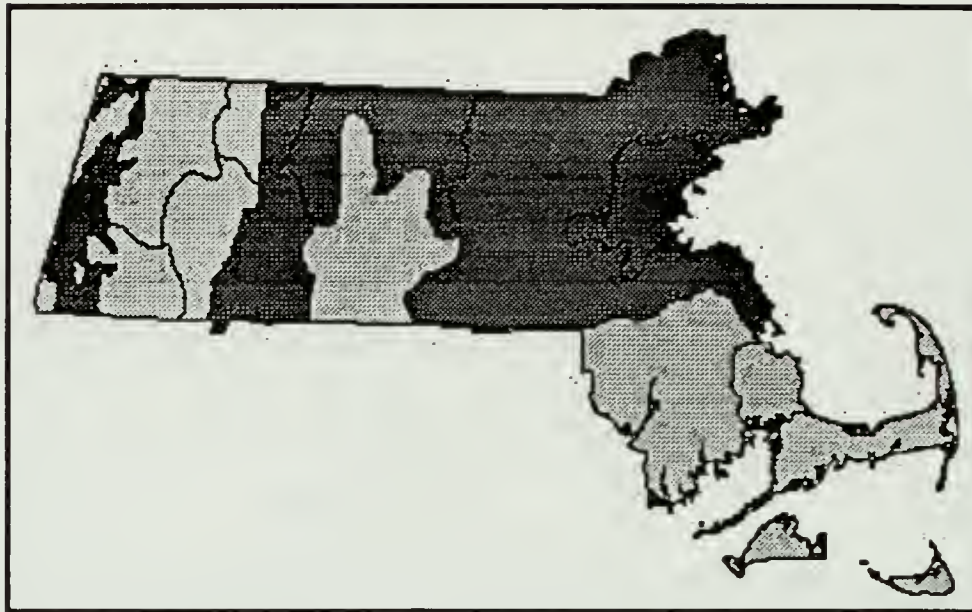
Other: Acidic and circumneutral graminoid marshes [Weatherbee 1996]

Author: J. Kearsley

Date: 7/21/99

Community Name:
Community ELCODE:
SRANK:
Tracked:

WET MEADOW
CP2A0A2000
S4
No



- Concept:** Graminoid/emergent herbaceous communities that are similar to deep and shallow emergent marshes except that they are temporarily rather than seasonally flooded. The soil is saturated during the growing season but not generally inundated. Repeated disturbance, usually from grazing or mowing, keeps these communities open.
- Environmental setting:** Wet meadows occur in lake basins, wet depressions, along streams, and in sloughs and other backwater areas with impeded drainage along rivers. The mucky mineral soils are permanently saturated and flood occasionally, standing water is not present throughout the growing season as in deep and shallow emergent marshes. As these communities flood only temporarily, continued disturbance is necessary to prevent encroachment by woody plants. More information is needed on the physical and biological characteristics of wet meadow and marsh communities.
- Vegetation Description:** Tussock-forming sedges, such as tussock-sedge (*Carex stricta*) or marsh-sedge (*Carex lacustris*), are often dominant, with over 50% of the cover, with variable proportions of other graminoids and herbaceous species. Canada bluejoint (*Calamagrostis canadensis* var. *canadensis*), wool-grass (*Scirpus cyperinus*), slender woolly-fruited sedge (*Carex lasiocarpa* var. *americana*), slender spike-sedge (*Eleocharis tenuis*), stalked wool-grass (*Scirpus pedicellatus*), rice cut-grass (*Leersia oryzoides*), and brown beak-sedge (*Rhynchospora capitellata*) are typical of wet meadows. Characteristic herbaceous associates include erect water smartweed (*Polygonum amphibium* var. *emersum*), pickerel-weed (*Pontederia cordata* var. *cordata*), river-horsetail (*Equisetum fluviatile*), nodding bur-marigold (*Bidens cernua*), spotted joe-pye-weed (*Eupatorium maculatum*), northern blue flag (*Iris versicolor*), and sweet flag (*Acorus calamus*). Calcareous wet meadows have calciphilic species, including red-footed spike-sedge (*Eleocharis erythropoda*), delicate sedge (*Carex leptalea*), fen-sedge (*Carex tetanica*), and beaked-sedge (*Carex utriculata*). More information is also needed on calcareous wet meadows in order to clarify their relationship to calcareous sloping fens and calcareous seepage marshes [both of which are described in the calcareous peatlands section due to their accumulation of peat]. Wet meadows are very closely related to shallow emergent marshes, but typically have more uniform vegetation, i.e. often a single sedge species dominates. Wet meadows are called "sedge meadows" in many other states, but "wet meadow" is used in Massachusetts because of known occurrences of meadows dominated by rice cut-grass and other non-sedge species.
- Associations:** No associations have been described in Massachusetts.
- Habitat values for Associated Fauna:** Wet meadows can function as vernal pool habitat if water remains standing for 2-3 months; these areas provide important amphibian breeding habitat.
- Associated rare plants:**
- | | | |
|-------------------|-----------------|------|
| CAREX ALOPECOIDEA | FOXTAIL SEDGE | T |
| CAREX BUSHII | BUSH'S SEDGE | E |
| CAREX BUXBAUMII | BUXBAUM'S SEDGE | - WL |
| CAREX EXILIS | BOG-SEDE | - WL |

CAREX HAYDENII	HAYDEN'S SEDGE	- WL
CAREX SCHWEINTZII	SCHWEINTZ'S SEDGE	E
CAREX TRICHOCARPA	HAIRY-FRUITED SEDGE	T
ELEOCHARIS OBTUSA VAR OVATA	OVATE SPIKE-SEDE	E
ELEOCHARIS ERYTHROPODA	RED-FOOTED SPIKE-SEDE	-WL
GENTIANA CRINITA	FRINGED GENTIAN	- WL
OPHIOGLOSSUM PUSILLUM	ADDER'S-TONGUE FERN	T
PEDICULARIS LANCEOLATA	SWAMP LOUSEWORT	E
PLATANThERA FLAVA VAR HERBIOLA	PALE GREEN ORCHIS	T
SCIRPUS LONGII	LONG'S BULRUSH	E
SCIRPUS PENDULUS	PENDULOUS BULRUSH	- WL

Associated rare animals:

AMBYSTOMA JEFFERSONIANUM	JEFFERSON SALAMAND ER	SC
AMBYSTOMA LATERALE	BLUE-SPOTTED SALAMAND ER	SC
AMBYSTOMA OPACUM	MARbled SALAMAND ER	T
AMMODRAMUS HENSLOWII	HENSLOW'S SPARROW	E
BARTRAMIA LONGICAUDA	UPLAND SAND PIPER	E
BOTAURUS LENTIGINOSUS	AMERICAN BITTERN	E
CIRCUS CYANEUS	NORTHERN HARRIER	T
DESMOCERUS PALLIATUS	ELDERBERRY LONG-HORNED BEETLE	SC
EULIMNADIA AGASSIZII	AGASSIZ'S CLAM SHRIMP	E
HEMIDACTYLIUM SCUTATUM	FOUR-TOED SALAMAND ER	SC
LIMNADIA LENTICULARIS	AMERICAN CLAM SHRIMP	SC
SCAPHIOPUS HOLBROOKII	EASTERN SPADEFOOT	T
SYNAPTOMYS COOPERI	SOUTHERN BOG LEMMING	SC

Examples: White Brook; Russell Cove, Hadley.

Threats: Wet meadows are threatened by filling and dredging, and by nutrient inputs from adjacent roads, fields, or septic systems. The invasion and spread of purple loosestrife (*Lythrum salicaria*) alters community structure and composition.

Management needs: Efforts are needed to control the spread of purple loosestrife. Continue activity that has kept the community open, e.g. fall mowing.

Inventory need rank: 2

Inventory comments: Statewide inventory of marshes and wet meadows is needed.

Synonyms:

USNVC/TNC: ??

MA [old name]: Southern New England nutrient-rich streamside/lakeside marsh [CP4A1A0000].

ME: Sedge meadow community.

VT: Sedge meadow.

NH: Shallow emergent marsh [which they have subdivided into 5 subtypes: reed-grass meadow, tussock sedge meadow, medium sedge meadow, bulrush meadow, short graminoid-forb marsh].

NY: Sedge meadow.

CT: not described.

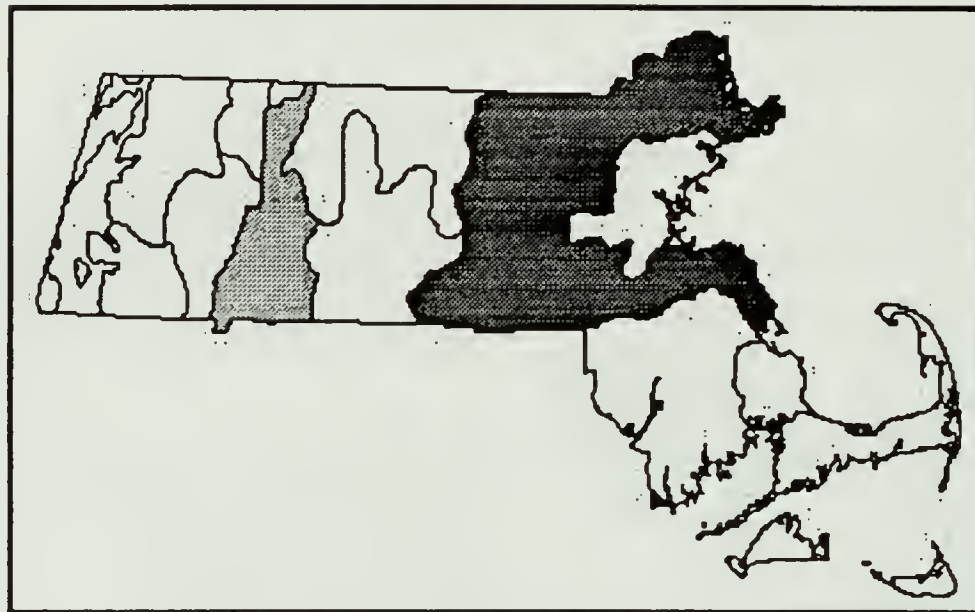
RI: not described.

Golet & Larson, 1974: Ungrazed meadow (M-1); grazed meadow (M-2).

Author: J. Kearsley

Date: 7/21/99

Community Name: **KETTLEHOLE WET MEADOW**
 Community ELCODE: CP2A0A2100
 SRANK: S3
 Tracked: Yes



- Concept:** Graminoid/emergent herbaceous or mixed shrub/herbaceous communities that are restricted to small, usually less than five acres, seasonally inundated, kettle depressions in sandy glacial outwash.
- Environmental setting:** Kettlehole wet meadows are a variant of wet meadows that are restricted to glacial kettleholes in sandy outwash soils that have seasonal water level fluctuations. They are seasonally inundated by local runoff and ground water fluctuations, and they typically have no inlet or outlet. For most of the summer, they look like shallow ponds, but by late summer they are covered by emergent vegetation. Soils are typically shallow, mucky peats. Deep peat does not develop due to the seasonal drawdown of water. The hydrology of kettlehole wet meadows is similar to coastal plain ponds. Both are characterized by a series of plant associations occurring along a gradient from the higher, drier margins to the lower, wetter centers.
- Vegetation Description:** Sedges and rushes are dominant, and characteristic species include Canada rush (*Juncus canadensis*), pondshore rush (*Juncus pelocarpus*), bayonet rush (*Juncus militaris*), needle spike sedge (*Eleocharis acicularis*), Small's spike sedge (*Eleocharis smallii*), Torrey's bullesedge (*Scirpus torreyi*) and various sedge (*Carex*) species. Shorter plants, like pipewort (*Eriocaulon aquaticum*), are found growing beneath the cover of sedges and rushes. Grasses, such as creeping bent grass (*Agrostis stolonifera*), and some broad-leaved emergents, including arrowhead (*Sagittaria engelmanniana*), nodding bur-marigold (*Bidens cernua*), beggar's ticks (*Bidens tripartita*) and common St. John's wort (*Hypericum perforatum*), also occur. The wettest, muckiest areas have floating-leaved aquatic plants, including white water lily (*Nymphaea odorata*) and mermaid-weed (*Proserpinaca palustris*). When water levels are high, mannagrass (*Glyceria pallida* and *G. acutifolia*) is common, with yellow pond-lily (*Nuphar variegata*) and pickerel-weed (*Pontederia cordata*) occurring in deeper water. Kettlehole wet meadows are typically fringed with shrubs, such as leatherleaf (*Chamaedaphne calyculata*), high-bush blueberry (*Vaccinium corymbosum*), buttonbush (*Cephalanthus occidentalis*) and water willow (*Decodon verticillatus*), and with trees such as tupelo (*Nyssa sylvatica*) and red maple (*Acer rubrum*). Common meadow-beauty (*Rhexia virginica*) and various species of sphagnum moss (*Sphagnum* spp.) also grow along the edges. Kettlehole wet meadows are best visited in the late-summer when water levels are down, and the basin is covered by a dense growth of narrow-leaved emergents.
- Associations:** No associations have been described in Massachusetts.
- Habitat values for Associated Fauna:** Kettlehole wet meadows can function as vernal pool habitat if water remains standing for 2-3 months; these areas provide important amphibian breeding habitat. The sedges, bulrushes and grasses of kettlehole wet meadows provide a food resource for waterfowl and other marsh birds.

Associated rare plants:

SCIRPUS TORREYI

TORREY'S BULLEDGE

- WL

Associated rare animals:

AMBYSTOMA LATERALE	BLUE-SPOTTED SALAMAND ER	SC
AMBYSTOMA OPACUM	MARBLED SALAMAND ER	T
DESMOCERUS PALLIATUS	ELDERBERRY LONG-HORNED BEETLE	SC
HEMIDACTYLUM SCUTATUM	FOUR-TOED SALAMAND ER	SC
SCAPHIOPUS HOLBROOKII	EASTERN SPADEFOOT	T
SYNAPTOMYS COOPERI	SOUTHERN BOG LEMMING	SC

Examples: There are currently three tracked sites, one in Douglas State Forest in Douglas and two in Minuteman National Park in Concord. More sites undoubtedly exist.

Threats: Alterations to natural water-level fluctuations. The sites for which we have vegetation data have surprisingly few non-native plant species, and exotics may not currently threaten these communities.

Management needs: More information is needed on the physical and hydrological processes associated with Kettlehole wet meadows in order to make educated management recommendations. It is known that seasonal water level fluctuations play an important role in the occurrence of the community. Spring high-water levels prevent encroachment of woody shrubs and trees, and late-summer low-water levels allow characteristic narrow-leaved emergents to appear. Any alteration in natural water level fluctuations, such as groundwater withdrawal, would negatively affect the community. Inland Basin Marshes may be prone to burning during low water periods, but the role of fire in community dynamics is not known.

Inventory need rank: 1

Inventory comments: Statewide inventory needed to clarify relationship to marshes; wet meadows; inland acidic pondshore/lakeshores; and coastal plain ponds.

Synonyms:
USNVC/TNC:

MA [old name]: SNE Inland basin marsh [CP2A3A0000].

ME: not described.

VT: not described.

NH: Inland Basin Marsh.

NY: not described.

CT: not described.

RI: not described.

Golet & Larson, 1974: Ungrazed meadow (M-1); grazed meadow (M-2).

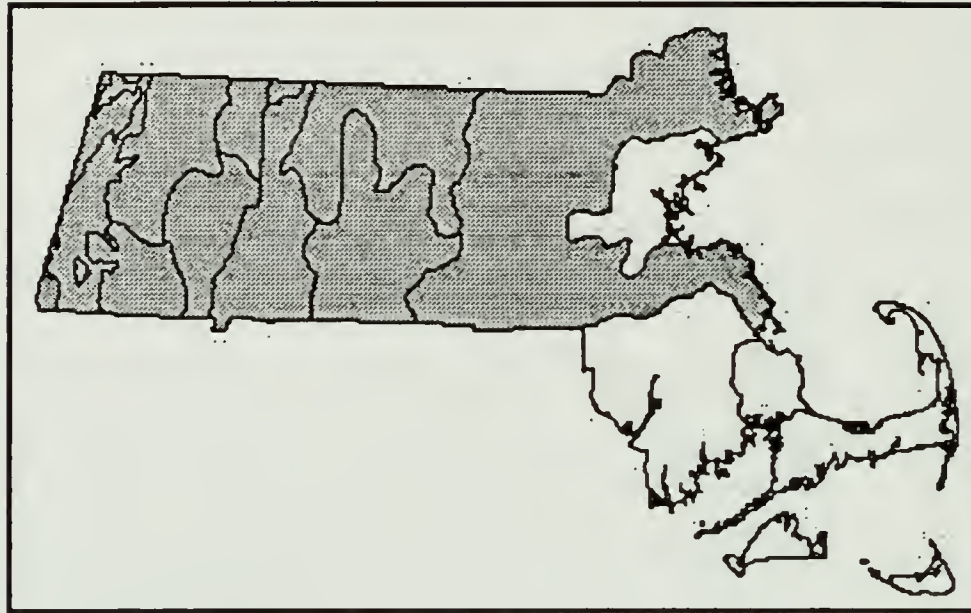
Other:

Author: J. Kearsley

Date: 7/21/99

Community Name:
Community ELCODE:
SRANK:
Tracked:

INLAND ACIDIC PONDShORE/LAKESHORE
CP2A0B1100
S4
No



- Concept:** Sparsely vegetated exposed gravelly, sandy or muddy shores of acidic, inland lakes and ponds that experience seasonal drawdown of water levels.
- Environmental setting:** Inland acidic pondshores/lakeshores are submerged or saturated for a significant part of the year or continuously in wet years. Plants of the community emerge during low water periods. More information is needed.
- Vegetation Description:** Vegetative cover may be sparse and species composition is variable. An exposed pondshore in Holyoke has mixed graminoid vegetation with Philadelphia panic-grass (*Panicum philadelphicum*), flat-stemmed panic-grass (*Panicum rigidulum* var. *rigidulum*), fall panic-grass (*Panicum dichotomiflorum* var. *dichotomiflorum*), southern ticklegrass (*Agrostis hyemalis*), rice cut-grass (*Leersia oryzoides*), lakeshore hemicarpha (*Hemicarpha micrantha*), autumn-fimbry (*Fimbristylis autumnalis*), awned flatsedge (*Cyperus squarrosus*), and other associated herbs including northern water-horehound (*Lycopus uniflorus*), beggar-ticks (*Bidens frondosa*), slender gerardia (*Agalinus tenuifolia*), and golden pert (*Gratiola aurea*). More information is needed on characteristic vegetation of acidic pondshores.
- Associations:** No associations have been described in Massachusetts.
- Habitat values for Associated Fauna:**
- Associated rare plants:**
- | | | |
|------------------------|--------------------------|----|
| ELEOCHARIS INTERMEDIA | INTERMEDIATE SPIKE-SEDGE | T |
| ORONTIUM AQUATICUM | GOLDEN CLUB | T |
| PANICUM PHILADELPHICUM | PHILADELPHIA PANIC-GRASS | SC |
| ROTAIA RAMOSIOR | TOOTH CUP | E |
- Associated rare animals:**
- | | | |
|----------------------|-------------------------|----|
| ENALLAGMA LATERALE | NEW ENGLAND BLUET | SC |
| ENALLAGMA RECURVATUM | PINE BARRENS BLUET | T |
| FERRISSIA WALKERI | WALKER'S LIMPET | SC |
| GAVIA IMMER | COMMON LOON | SC |
| PAPAPEMA SULPHURATA | WATER-WILLOW STEM BORER | T |

Examples: Ashley Pond, Holyoke.

Threats: More information is needed to assess the threats to acidic pondshore/lakeshore communities. Probable threats include trampling from ORVs, alteration of normal water-level fluctuations, and shoreline development.

Management needs: More information is needed to assess the management needs of acidic pondshore/lakeshore communities.

Inventory need rank: 2

Inventory comments: Statewide inventory needed.

Synonyms:

USNVC/TNC: ?

MA [old name]: Inland New England acidic pond shore/lake shore community [CP1A200000].

ME: not described.

VT: Outwash plain pondshore.

NH: Inland sandy pondshore/lakeshore (outwash plain pondshore).

NY: Inland non-calcareous lakeshore.

CT: not described.

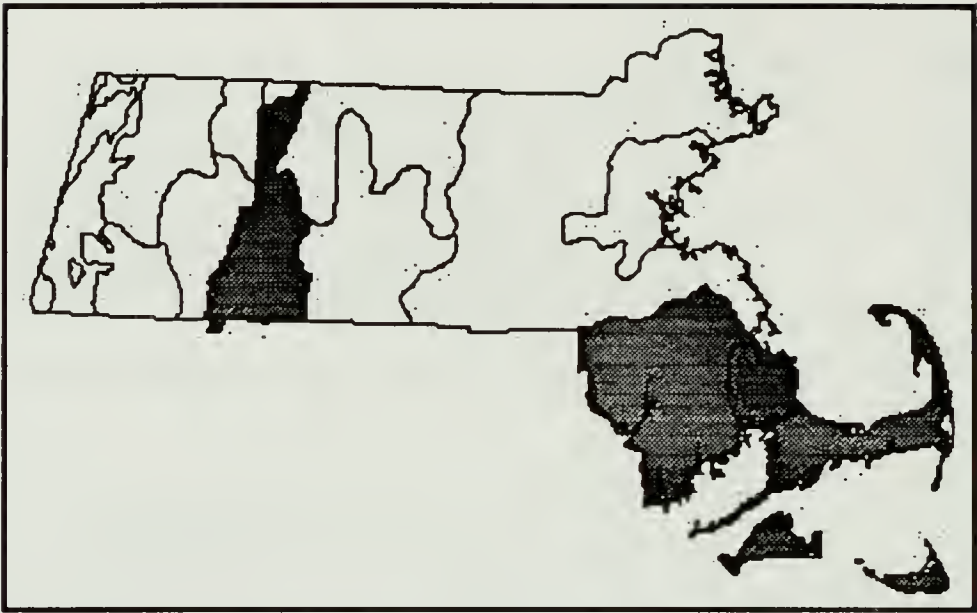
RI: not described.

Golet & Larson, 1974:

Other:

Author: J. Kearsley **Date:** 7/21/99

Community Name: COASTAL PLAIN PONDSHORE
Community ELCODE: CP2A0B1200
SRANK: S2
Tracked: Yes



Concept: Herbaceous communities of exposed pondshores, most commonly in southeastern Massachusetts in areas of oak and oak pine forests. characterized by a distinct coastal plain flora.

Environmental setting: Shallow, highly acidic groundwater ponds in glacial outwash, usually with no inlet or outlet. Water rises and falls with changes in the water table, typically leaving an exposed shoreline in late summer. In wet years, the pondshore may remain inundated. Substrate varies from sand - cobble to muck.

Vegetation Description: Vegetation zonation is correlated with flooding regime. A characteristic zonation pattern from dry to waterline, is as follows: 1. upland oak forest, 2. Shrub border dominated by highbush blueberry (*Vaccinium corymbosum*) associated with sweet pepperbush (*Clethra alnifolia*), and green briar (*Smilax rotundifolia*), 3. Emergent exposed pondshore dominated by coastal plain flat-topped goldenrod (*Euthamia tenuifolia*), pondshore rush (*Juncus pelocarpus*), rose coreopsis (*Coreopsis rosea*) and golden pert (*Gratiola aurea*), with beaksedge (*Rhynchospora* spp.), lance-leaf violet (*Viola lanceolata*), and dwarf St. John's-wort (*Hypericum mutilum*), 4. Semipermanently flooded zone characterized by one or more of the following: bayonet rush (*Juncus militaris*), spike-sedge (*Eleocharis* spp.), pipewort (*Eriocaulon aquaticum*), and 5. Hydromorphic rooted vegetation in deeper water including yellow water-lily (*Nuphar variegata*), white water-lily (*Nymphaea odorata*) and Robbins' spike-sedge (*Eleocharis robbinsii*). Not every pond has every zone, and zones vary in width and species composition from year to year. Coastal plain pondshores have an abundance of state-protected and globally restricted rare plants.

Associations: USNVC/TNC coastal plain pond associations include plot data from Massachusetts coastal plain pondshores.

Habitat values for Coastal plain pondshores and ponds provide habitat for at least 43 rare animal and plant species.

Associated Fauna: Coastal plain pondshores are important habitat for over 45 species of dragonflies and damselflies. They are also important habitat for painted, musk, spotted, snapping, and the federally endangered Plymouth red belly turtles. Larger ponds are used by migrating and wintering waterfowl, including common and hooded mergansers, goldeneye, and bufflehead. Coastal plain ponds support warm-water fish and freshwater mussels. They function as vernal pool habitat when fish are absent.

Associated rare plants:

DICHANTHELIUM WRIGHTIANUM	WRIGHT'S PANIC-GRASS	SC
DROSER A FILIFORMIS	THREAD-LEAVED SUNDEW	- WL
ELEOCHARIS MELANOCARPA	BLACK-FRUITED SPIKE-RUSH	- WL
ELEOCHARIS TRICOSTATA	THREE-ANGLED SPIKE-SEDGE	E
EUPATORIUM LEUCOLEPIS VAR NOVAE-ANGLIAE	NEW ENGLAND BONESET	E
FUIRENA PUMILA	UMBRELLA-GRASS	- WL
HYPERICUM ADPRESSUM	CREEPING ST. JOHN'S-WORT	T
JUNCUS BIFLORUS	TWO-FLOWERED RUSH	E
LACHNANTHES CAROLIANA	REDROOT	SC
POLYGONUM PURITANORUM	PONDSHORE KNOTWEED	SC

RHEXIA MARIANA	MARYLAND MEADOW BEAUTY	E
RHYNCHOSPORA INUNDATA	INUNDATED HORNED-SEDGE	T
RHYNCHOSPORA NITENS	SHORT-BEAKED BALD-SEDGE	T
RHYNCHOSPORA SCIRPOIDES	LONG-BEAKED BALD-SEDGE	SC
RHYNCHOSPORA TORREYANA	TORREY'S BEAK-SEDGE	E
SABATIA CAMPANULATA	SLENDER MARSH PINK	E
SABATIA KENNEDYANA	PLYMOUTH GENTIAN	SC
SAGITTARIA TERES	TERETE ARROWHEAD	SC
SCLERIA RETICULARIS	RETICULATE NUT-RUSH	- WL
UTRICULARIA BIFLORA	TWO-FLOWERED BLADDERWORT	T

Associated rare animals:

ALASMIDONTA UNDULATA	TRIANGLE FLOATER	SC
AMBYSTOMA LATERALE	BLUE-SPOTTED SALAMANDER	SC
ANAX LONGIPES	COMET DARNER	SC
CLEMMYS GUTTATA	SPOTTED TURTLE	SC
ENALLAGMA LATERALE	NEW ENGLAND BLUET	SC
ENALLAGMA RECURVATUM	PINE BARRENS BLUET	T
FERRISSIA WALKERI	WALKER'S LIMPET	SC
LEPTODEA OCHRACEA	TIDEWATER MUCKET	SC
LIGUMIA NASUTA	EASTERN POND MUSSEL	SC
PANDION HALIAETUS	OSPREY	- WL
PSEUDEMYD R. RUBRIVENTRIS POP 1	RED-BELLIED TURTLE	E
SPONGILLA ASPINOSA	SMOOTH BRANCHED SPONGE	SC

Examples: Hyannis Ponds, WMA, Barnstable; Myles Standish State Forest, Carver; Nickerson State Park, Brewster.

Threats: Multiple threats affect coastal plain pondshore communities. The greatest threat is from overdevelopment of coastal Massachusetts which impacts pondshores directly through housing and recreation and indirectly through water withdrawal. Shrub and tree encroachment threaten pondshore vegetation in areas with heavy water withdrawal.

Management needs: Natural hydrology needs to be maintained. Periodic high water prevents tree / shrub encroachment, and seasonal low water is necessary to expose the pondshore. Vehicle use should be prohibited along pondshores.

Inventory need rank: 2

Inventory comments: Community information and ranking specifications needed.

Synonyms:

USNVC/TNC: The following USNVC/TNC associations are known to occur in Massachusetts, and are included within the broad category of coastal plain pondshore community. They are listed according to the zones in which they occur. Shrub border (zone 2) includes *Vaccinium corymbosum*/Sphagnum spp. shrubland [CEGL006190] and a typically narrow band of *Calamagrostis canadensis*-*Dichanthelium meridionale* herbaceous vegetation [CEGL006243]. The emergent exposed pondshore (zone 3) is characterized by one or more of the following: *Rhexia virginica*-*Panicum verrucosum* herbaceous vegetation [CEGL006264]; *Rhexia virginica*-*Crotalaria sagittalis* herbaceous vegetation [CEGL006300]; and *Rhynchospora capitellata*-*Sabatia kennedyana* herbaceous vegetation [CEGL006210]. The semipermanently flooded zone (zone 4) has *Lysimachia terrestris*-*Dulichium arundinaceum* herbaceous vegetation [CEGL006035]; *Juncus militaris* herbaceous vegetation [CEGL006345]; *Eleocharis (obtusata, flavescent)*-*Eriocaulon aquaticum* herbaceous vegetation [CEGL006261]; and *Eleocharis flavescent*-*Xyris difformis* herbaceous vegetation [CEGL006400]. Open water (zone 5) is common to other ponds in MA and includes *Nuphar lutea* ssp. *advena* herbaceous vegetation [CEGL004324] and *Nymphaea odorata*-*Eleocharis robbinsii* herbaceous vegetation [CEGL006086].

MA [old name]: New England coastal plain pondshore [CP1A100000].

ME: not described.

VT: not described.

NH: Coastal plain pondshore.

NY: Outwash plain pondshore.

CT: not described?.

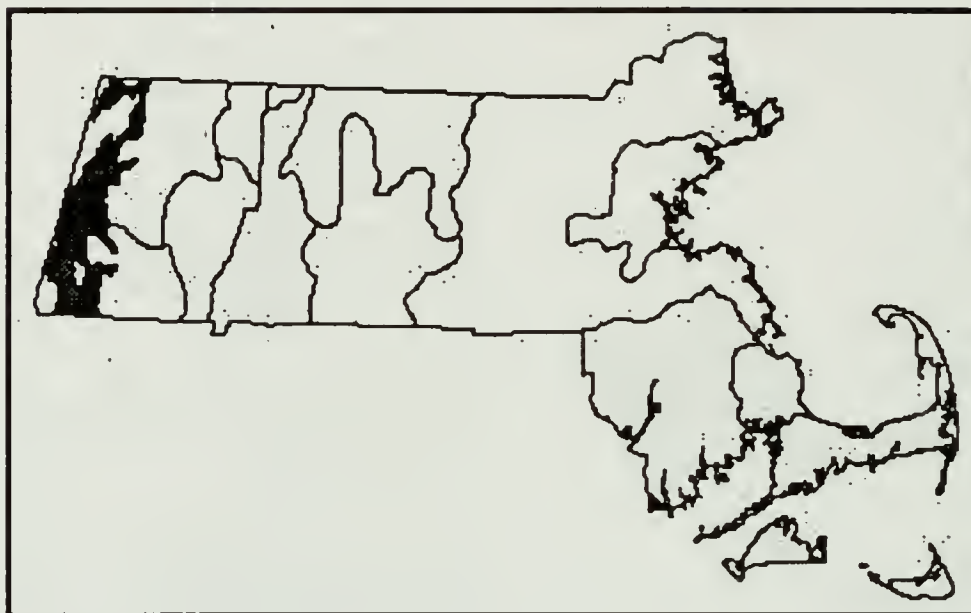
RI: Coastal plain pond shore.

Author: J. Kearsley

Date: 7/21/99

Community Name:
Community ELCODE:
SRANK:
Tracked:

CALCAREOUS PONDSHORE/LAKESHORE
CP2A0B1300
S2
Yes



Concept: Sparsely vegetated exposed gravelly, sandy or muddy shores of calcareous or circumneutral, inland lakes and ponds that experience seasonal drawdown of water levels.

Environmental setting: Calcareous pondshores/lakeshores are submerged or saturated for a significant part of the year or continuously in wet years. Plants of the community emerge during low water periods.

Vegetation Description: Probable community type. No information is currently available on calcareous pond/lakeshores in Massachusetts. Inventory and community descriptions are needed. Ponds contain Chara beds.

Associations: No associations have been described in Massachusetts.

Habitat values for Associated Fauna: Listed animals below are of the calcareous pond, not the shore line.

Associated rare plants:
NONE KNOWN

Associated rare animals:

ENALLAGMA CARUNCULATUM	TULE BLUET	SC
PYRGULOPSIS LUSTRICA	PILSBRY'S SPIRE SNAIL	E
VALVATA SINCERA	BOREAL TURRET SNAIL	E

Examples: Ponds in Berkshire County, such as Stockbridge Bowl, may have a shoreline community developed.

Threats: More information is needed to assess the threats to calcareous pondshore/lakeshore communities. Probable threats include disturbance from ORVs, alteration of normal water-level fluctuations, and shoreline development. Exotic species and indiscriminate control of aquatic plants are both problems.

Management needs: More information is needed to assess the management needs of calcareous pondshore/lakeshore communities.

Inventory need rank: 1

Inventory comments: Community descriptions for Berkshire County pondshores are needed.

Synonyms:

USNVC/TNC:

MA [old name]: New England calcareous pond shore/lake shore community [CP1B000000].

ME: not described
VT: not described
NH: not described
NY: Inland calcareous lakeshore.
CT: not described
RI: not described

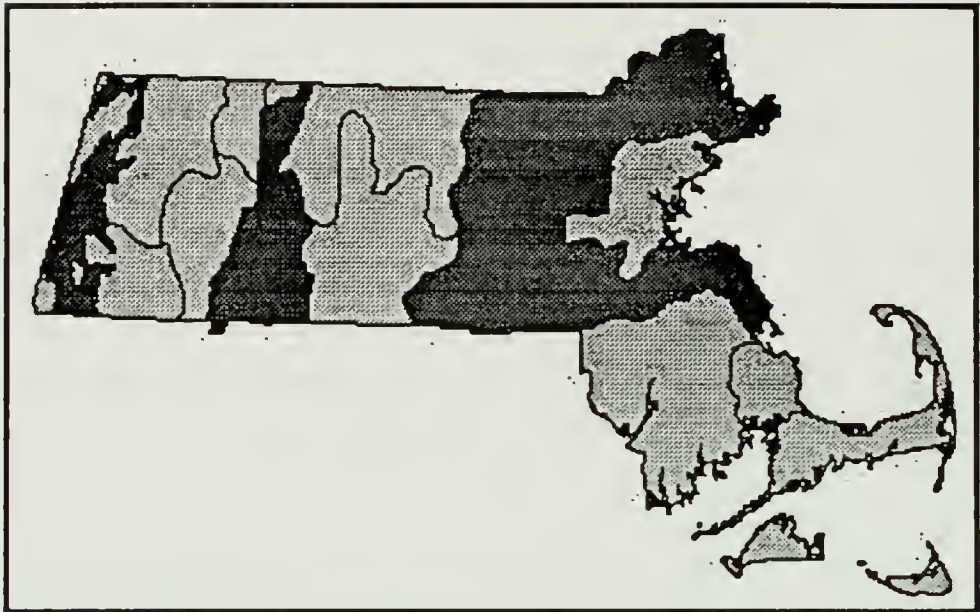
Golet & Larson, 1974:

Other:

Author: J. Kearsley

Date:7/21/99 [PCS modified 3/31/00]

Community Name: MUD FLAT
Community ELCODE: CP2A0B2100
SRANK: S4
Tracked: No



Concept: Sparsely vegetated herbaceous community dominated by low, usually annual herbs occurring on muddy streambanks or in shallow water of river backwaters and old oxbow ponds.

Environmental setting: Shallow water or open mud flats along streams, in backwaters, abandoned channels, lagoons, and oxbow ponds. Inundation by spring floods does occur, and the mucky, silty mineral soils are poorly drained.

Vegetation Description: Although often sparsely vegetated, mudflats typically have a high species richness (*i.e.* number of species). Winged (*Mimulus alatus*) and long-stalked (*Mimulus ringens*) monkey-flowers are good indicator species. Large and lesser water-plantains (*Alisma plantago-aquatica* var. *americanum* and var. *parviflorum*), arrowheads (*Sagittaria* spp.), arrow-arum (*Peltandra virginica*), and bur-reeds (*Sparganium* spp.) are often dominant. Other associated species include sensitive fern (*Onoclea sensibilis*), false nettle (*Boehmeria cylindrica*), clearweed (*Pilea pumila*), water-hemlock (*Cicuta maculata*), sweet flag (*Acorus americanus*), wild calla (*Calla palustris*), water-parsnip (*Sium suave*), ditch-stonecrop (*Penthorum sedoides*), water-purslane (*Ludwigia palustris*), awned sedge (*Carex crinita*), river horsetail (*Equisetum fluviatile*), smartweeds (*Polygonum* spp.), and duckweeds (*Lemna* spp.). Floodplain forest trees, such as silver maple (*Acer saccharinum*) and American elm (*Ulmus americana*), often overhang these communities providing partial cover.

Associations: No associations have been described in Massachusetts.

Habitat values for Associated Fauna:

Associated rare plants:

ELEOCHARIS INTERMEDIA	INTERMEDIATE SPIKE-SEDGE	T
MIMULUS ALATUS	WINGED MONKEY-FLOWER	E

Associated rare animals:

FERRISSIA WALKERI	WALKER'S LIMPET	SC
POMATIOPSIS LAPIDARIA	RIVERBANK LOOPING SNAIL	E

Examples: Bennett Meadow WMA; Gill; Hop Brook, Lee; Cone Brook, Richmond.

Threats: True forget-me-not (*Myosotis scorpioides*) and moneywort (*Lysimachia nummularia*) are mat-forming, non-native plant species that can appear to be crowding out native plants. Purple loosestrife (*Lythrum salicaria*) can also occur in these habitats.

Management needs: Eradication of moneywort and true forget-me-not, especially in areas where they are associated with winged monkey-flower, a state-protected rare plant species.

Inventory need rank: 2

Inventory comments:

Synonyms:

USNVC/TNC: River mud flats sparse vegetation [CEGL002314].

MA [old name]: not described.

ME: similar to Riverine emergent community.

VT: River mud shore community.

NH: not described.

NY: not described.

CT: not described.

RI: not described.

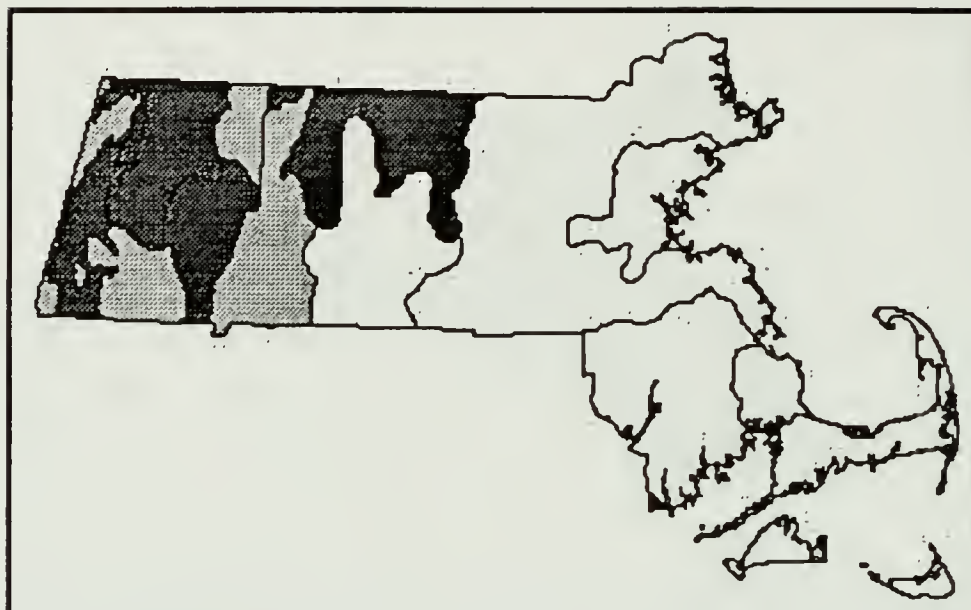
Golet & Larson, 1974: not described.

Other:

Author: J. Kearsley

Date: 7/21/99

Community Name: **RIVERSIDE SEEP**
Community ELCODE: CP2A0B2200
SRANK: S2
Tracked: Yes



- Concept:** Mixed herbaceous community occurring on rocky edges of rivers where flood and ice scour maintain an open community and groundwater discharge provides mineral enrichment.
- Environmental setting:** Riverside seeps occur at the base of steep riverbanks where groundwater seeps out of the bottom of the upland slope. Mineral-rich seepage leads to a high species diversity and periodic flooding from the river helps to prevent woody shrub encroachment. Calcareous (*limey*) riverside seeps occur along the Connecticut River in New Hampshire and Vermont and are characterized by their fen-like conditions and calcium-loving plant species, particularly false asphodel (*Tofieldia glutinosa*), Kalm's lobelia (*Lobelia kalmii*), and grass-of-Parnassus (*Parnassia glauca*). Comparable riverine limey seep communities are not known to occur in Massachusetts [Motzkin 1993]. The known occurrences of riverside seeps in Massachusetts along the Westfield and Deerfield Rivers lack the calcareous conditions and indicators of limey seeps to the north. More information is needed on the water chemistry of riverside seeps in Massachusetts, and on the range of conditions and species assemblages present in the Commonwealth. Riverside seeps are often associated with riverside outcrop communities and high-energy riverbank, i.e. gravel bar, communities.
- Vegetation Description:** The wettest spots are typically mossy with a mixture of herbs and sedges. Characteristic herbs include spotted Joe-pye-weed (*Eupatorium maculatum*), boneset (*Eupatorium perfoliatum*), orange jewelweed (*Impatiens capensis*), and fringed loosestrife (*Lysimachia ciliata*). Yellow monkey flower (*Mimulus moschatus*), Canadian burnet (*Sanguisorba canadensis*), and golden alexanders (*Zizia aurea*) are indicative of minerotrophic conditions, and they are good indicator species of the community type. The non-native plants, colt's foot (*Tussilago farfara*) and purple loosestrife (*Lythrum salicaria*), can also be abundant in the community. Graminoids known to occur in riverside seeps include wool-grass (*Scirpus cyperinus*), marsh-rush (*Juncus canadensis*), soft rush (*Juncus effusus*), green-fruited bur-reed (*Sparganium erectum*), sallow sedge (*Carex lurida*), northern awned-sedge (*Carex gynandra*), and seep-sedge (*Carex scabrata*). The vegetation composition described here is probably limited to sites occurring in the western part of the state.
- Associations:** No associations have been described in Massachusetts.
- Habitat values for Associated Fauna:**
- Associated rare plants:**
- | | | |
|--------------------------|---------------------|------|
| ALNUS VIRIDIS SSP CRISPA | MOUNTAIN ALDER | SC |
| CAREX TRICHOCARPA | HAIRY-FRUITED SEDGE | T |
| HALENIA DEFLEXA | SPURRED GENTIAN | E |
| JUNCUS NODOSUS | KNOTTED RUSH | - WL |
| MIMULUS MOSCHATUS | MUSKFLOWER | T |

Associated rare animals:

NONE KNOWN

Examples: Westfield River in Cummington.

Threats: It is not known to what extent dam construction and the resulting altered hydrology has affected the occurrence of riverside seep communities. These communities are disturbed by trampling from recreation which leads to the invasion of non-native plant species. Purple loosestrife can be dominant where disturbance is high.

Management needs: Removal of non-native plant species and maintenance of natural flooding regimes.

Inventory need rank: 1

Inventory comments: Statewide inventory is needed.

Synonyms:

USNVC/TNC: not described.

MA [old name]: New England Riverside Seep Community.

ME: Riverside Seep Community.

VT: Calcareous Riverside.

NH: Calcareous Riverside Seep Community, Acidic Riverside Seep Community.

NY: Riverside Ice Meadow.

CT: not described.

RI: not described.

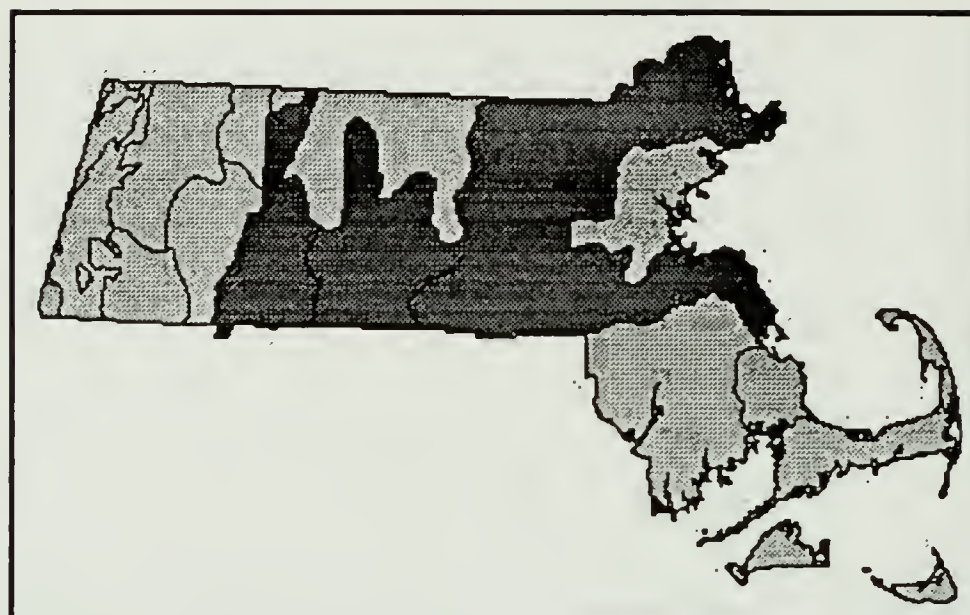
Golet & Larson, 1974:

Other:

Author: J. Kearsley

Date: 7/21/99

Community Name: **LOW-ENERGY RIVERBANK**
 Community ELCODE: CP2A0B2300
 SRANK: S4
 Tracked: No



- Concept:** Open herbaceous/graminoid communities occurring on sandy or silty mineral soils of river and streambanks that do not experience severe flooding or ice scour.
- Environmental setting:** Low-energy rivers are smaller, low-gradient rivers that do not experience severe flooding. The riverbanks are generally sandy or silty. They lack the cobble substrate of high-energy areas and the muddy soils of open mud flats. These communities occur on mineral soil rather than the peaty or mucky soil that characterizes alluvial marshes and wet meadows. More information is needed.
- Vegetation Description:** The species composition is variable but the structure is always an open mixture of herbaceous and graminoid species with occasional scattered shrubs and trees at the inland margin. Common species are reed canary-grass (*Phalaris arundinacea*), which can be dominant, cockspur-grass (*Echinochloa muricata*), fall panic-grass (*Panicum dichotomiflorum*), rice cut-grass (*Leersia oryzoides*), Canada bluejoint (*Calamagrostis canadensis* var. *canadensis*), St. John's-wort (*Hypericum* spp.), smartweeds (*Polygonum* spp.), and various goldenrod species (*Solidago* spp.). Species typical of disturbed areas, such as cocklebur (*Xanthium strumarium* var. *canadense*) are common in both high and low-energy riverbank communities. Low-energy riverbanks are more sparsely vegetated than marshes and wet meadows.
- Associations:** No associations have been described in Massachusetts.
- Habitat values for Associated Fauna:** Can provide turtle nesting habitat, and can be used by riverine odonates
- Associated rare plants:**
NONE KNOWN
- Associated rare animals:**
- | | | |
|------------------------|--------------------|----|
| CLEMMYS INSCULPTA | WOOD TURTLE | SC |
| GOMPHUS FRATERNUS | MIDLAND CLUBTAIL | E |
| GOMPHUS VASTUS | COBRA CLUBTAIL | SC |
| GOMPHUS VENTRICOSUS | SKILLET CLUBTAIL | SC |
| NEUROCORDULIA OBSOLETA | UMBER SHADOWDRAGON | SC |
| OPHIOGOMPHUS ASPERSUS | BROOK SNAKETAIL | SC |
| OPHIOGOMPHUS CAROLUS | RIFFLE SNAKETAIL | T |
| SOMATOCHLORA CINGULATA | LAKE EMERALD | SC |

SOMATOCHLORA ELONGATA	SKI-TAILED EMERALD	SC
SOMATOCHLORA GEORGIANA	COPPERY EMERALD	E
SOMATOCHLORA KENNEDYI	KENNEDY'S EMERALD	E
SOMATOCHLORA LINEARIS	MOCHA EMERALD	SC
STYLURUS AMNICOLA	RIVERINE CLUBTAIL	E
STYLURUS SCUDDERI	ZEBRA CLUBTAIL	E
STYLURUS SPINICEPS	A CLUBTAIL DRAGONFLY	T

Examples: Banks of the Nashua River in Ft. Devens.

Threats: Invasion by non-native plant species is the greatest threat to the community.

Management needs: Non-native plant species removal.

Inventory need rank: 2

Inventory comments: Inventory and community descriptions are needed.

Synonyms:

USNVC/TNC: similar to Phalaris arundinacea Eastern Herbaceous Vegetation.

MA [old name]: SNE low-energy riverbank community [CT1E2B1000].

ME: not described.

VT: similar to Rivershore grassland.

NH: similar to Riverside meadow community.

NY: not described.

CT: ?

RI: not described.

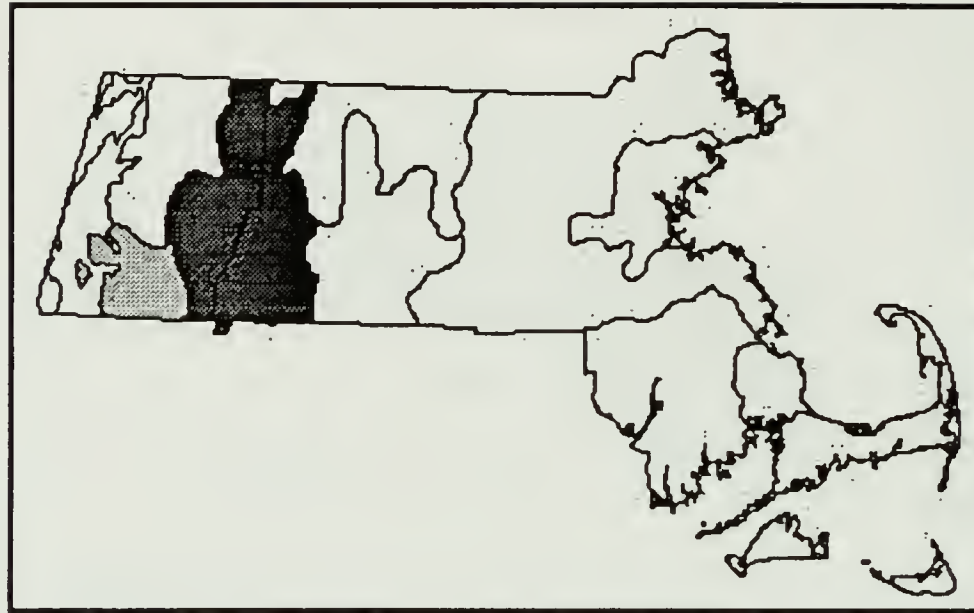
Golet & Larson, 1974:

Other:

Author: J. Kearsley **Date:** 7/21/99

Community Name:
Community ELCODE:
SRANK:
Tracked:

HIGH-ENERGY RIVERBANK
CP2A0B2400
S3
Yes



- Concept:** Sparse, open herbaceous/graminoid communities occurring on cobble and sand substrates of steep-gradient, fast-flowing rivers that experience severe flooding and ice scour.
- Environmental setting:** High-energy riverbank environments are created by the alluvial deposition of cobbles, sand and silt during high spring flood events, and they are shaped by continued annual flood events and winter ice scour. Differences in severity of scouring and flooding create a gradient of substrate types from the river's edge to the upland transition. Scouring and flooding are most intense at the river's edge, especially the upstream end of riverine islands, which receive the full force of ice floes and debris-laden flood waters. In the fast-moving water, only large cobbles are heavy enough to drop out of suspension. As the water crosses the cobblebar it slows down and smaller particles drop out, creating a continuum from cobbles and pebbles to sand and silt. That continuum correlates to a the change in vegetation communities.
- Vegetation Description:** Vegetation zonation within high-energy riverbank communities corresponds to substrate type and severity of flooding. On open cobbles, false dragonhead (*Physostegia virginiana*), cocklebur (*Xanthium strumarium*), beggar's ticks (*Bidens* spp.) and lady's thumb (*Polygonum persicaria*, an exotic) are dominant. As the percent sand increases, water horsetail (*Equisetum fluviatile*) and clasping dogbane (*Apocynum cannabinum* var. *hypericifolium*) occur, and there is typically a distinct band of switchgrass (*Panicum virgatum*). In the still sandier areas, mixed grasslands of switchgrass, big and little bluestem (*Andropogon gerardii* and *Schizachyrium scoparium*), Indian grass (*Sorghastrum nutans*), and goldenrods (*Solidago* spp.) are found. Intense flooding and ice scour prevents establishment and growth of trees or tall shrubs; cobble bars that do have a tree canopy (cover >30%) are classified separately as cobble bar forests. Short shrubs such as shadbush (*Amelanchier sanguinea*), silky dogwood (*Cornus amomum*), sand bar willow (*Salix exigua*) and sand bar cherry (*Prunus pumila* var. *depressa*) form a vegetation zone on the sandiest sections, typically bordering floodplain forests that occupy siltier soils.

Associations: No associations have been described in Massachusetts.

Habitat values for Associated Fauna: Riverine odonates use these areas as way stations.

Associated rare plants:

ALNUS VIRIDIS SSP CRISPA	MOUNTAIN ALDER	SC
ASTER TRADESCANTII	TRADESCANT'S ASTER	SC
CAREX LENTICULARIS	SHORE SEDGE	T
DESCHAMPSIA CESPITOSA SSP GLAUCA	TUFTED HAIRGRASS	E
PRUNUS PUMILA VAR DEPRESSA	SAND BAR CHERRY	SC

SALIX EXIGUA	SAND BAR WILLOW	SC
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Associated rare animals:

CICINDELA DUODECIMGUTTATA	TWELVE-SPOTTED TIGER BEETLE	SC
GOMPHUS FRATERNUS	MIDLAND CLUBTAIL	E
GOMPHUS VASTUS	COBRA CLUBTAIL	SC
GOMPHUS VENTRICOSUS	SKILLET CLUBTAIL	SC

Examples: Excellent examples of the community type in Massachusetts can be found on the upstream ends of the Sunderland Island s north of Sunderland Bridge on the Connecticut River.

Threats: The two major threats to high-energy river communities are alteration of natural flooding regimes due to river control projects and the invasion of non-native plant species. High-energy riverbank environments are created by severe flooding and ice scour, and these natural disturbance regimes are necessary to maintain the community. Because of the community's exposure to flooding, it is susceptible to colonization by exotic plants, such as purple loosestrife (*Lythrum salicaria*) and lady's thumb (*Polygonum persicaria*), that have their seeds washed in from upstream sources. Trampling from campers and boaters creates further disturbance and favors fast-growing exotic plants.

Management needs: Where possible, highly invasive exotic plants should be mechanically removed. Management to reduce non-native plant species throughout a drainage basin will help preserve the native plant communities of high-energy riverbanks. Natural hydrologic regimes should be maintained.

Inventory need rank: 3

Inventory comments: Good information available for Connecticut and Deerfield Rivers. Inventories needed for Westfield and Farmington Rivers.

Synonyms:

USNVC/TNC: not described [loosely similar to Hudsonia tomentosa-Paronychia argyrocoma dwarf-shrubland].

MA [old name]: SNE High-energy riverbanks [CT1E2A1000].

ME: High-energy riverbank community.

VT: River cobble shore community.

NH: Riverside Sand /Gravel Barrens.

NY: similar to Cobble shore and Riverside sand /gravel bar.

CT: not described.

RI: similar to Riverside sand /gravel bar.

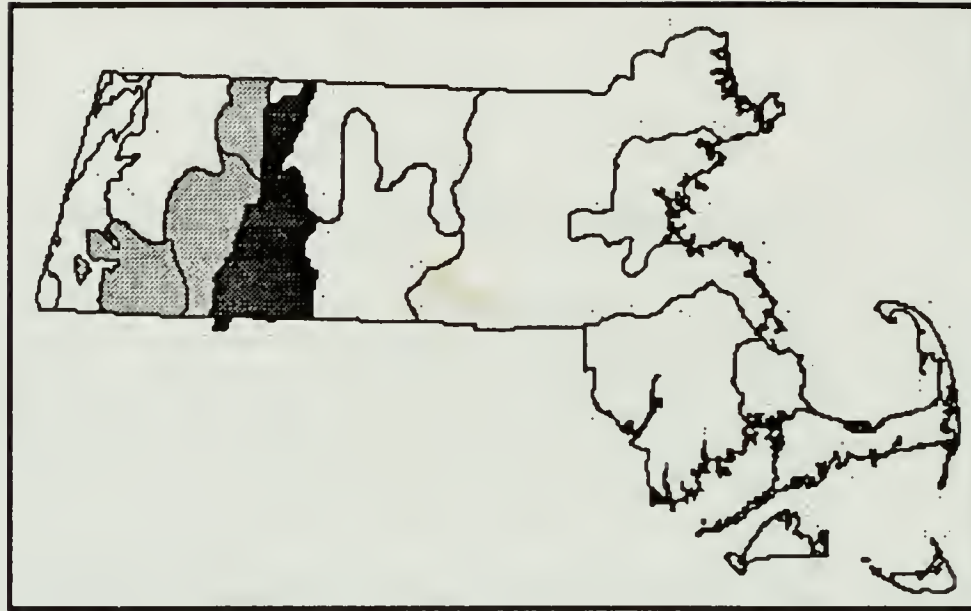
Golet & Larson, 1974:

Other:

Author:	J. Kearsley	Date:	7/21/99
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Community Name:
Community ELCODE:
SRANK:
Tracked:

RIVERINE POINTBAR AND BEACH
CP2A0B2500
S3
Yes



Concept: Sparsely vegetated exposed sandy beaches of major rivers.

Environmental setting: A poorly defined community type that is similar to high-energy riverbank communities but occurs on river-deposited sands rather than cobbles. Riverine pointbars/beaches may best be considered a sub-type of high-energy riverbanks. They are also associated with riverside outcrops and floodplain forests. More information is needed.

Vegetation Description: Open sand bars with sparse herbaceous and graminoid vegetation cover. Much of the community may be bare sand with only scattered plants, such as tall beggar's ticks (*Bidens vulgata*). Higher margins typically have smartweeds (*Polygonum* spp.), cocklebur (*Xanthium strumarium*), and graminoids, including soft-stemmed spike-sedge (*Eleocharis obtusa*), Smith's club-sedge (*Scirpus smithii*), awned flatsedge (*Cyperus squarrosus*), pondshore-flatsedge (*Cyperus dentatus*), and lovegrass (*Eragrostis* spp.). Sand bar willow (*Salix exigua*), a state-protected plant species, can occur along the higher margins. More information on species composition is needed. The Hudsonia riverside barrens of New Hampshire and southern Maine are not known to occur in Massachusetts.

Associations: No associations have been described in Massachusetts.

**Habitat values for
Associated Fauna:**

Associated rare plants:

ELEOCHARIS INTERMEDIA	INTERMEDIATE SPIKE-SEDGE	T
ELEOCHARIS OBTUSA VAR OVATA	OVATE SPIKE-SEDGE	E
SALIX EXIGUA	SAND BAR WILLOW	SC

Associated rare animals:

CICINDELA DUODECIMGUTTATA	TWELVE-SPOTTED TIGER BEETLE	SC
CICINDELA PURITANA	PURITAN TIGER BEETLE	E
GOMPHUS FRATERNUS	MIDLAND CLUBTAIL	E
GOMPHUS VASTUS	COBRA CLUBTAIL	SC
GOMPHUS VENTRICOSUS	SKILLET CLUBTAIL	SC
STYLURUS SPINICEPS	A CLUBTAIL DRAGONFLY	T

Examples: sandy beach on Connecticut River at Hatfield bend, Hatfield; Connecticut River at Pauchaug Meadows WMA Northfield; Rainbow Beach, Northampton.

Threats: Trampling from campers and boaters negatively impacts both the plant and animal communities of riverine pointbar and beach communities. Alterations to normal flooding regimes can impact alluvial deposition, resulting in expansion or reduction of beach size.

Management needs: Cocklebur (*Xanthium strumarium*) and Japanese knotweed (*Polygonum cuspidatum*) removal may be necessary from areas used as larval habitat by Puritan tiger beetles. The two species grow quickly and shade large areas thus eliminating habitat for the tiger beetles. More information is needed to assess the management needs for pointbars and beaches.

Inventory need rank: 1

Inventory comments: Inventory riverbends of major rivers. Community descriptions and plot data are needed.

Synonyms:

USNVC/TNC: not described.

MA [old name]: not described.

ME: River beach community.

VT: Riverside sand /gravel community.

NH: Riverside sand /gravel barren.

NY: similar to Riverside sand /gravel bar.

CT: not described.

RI: included within Riverside sand /gravel bar.

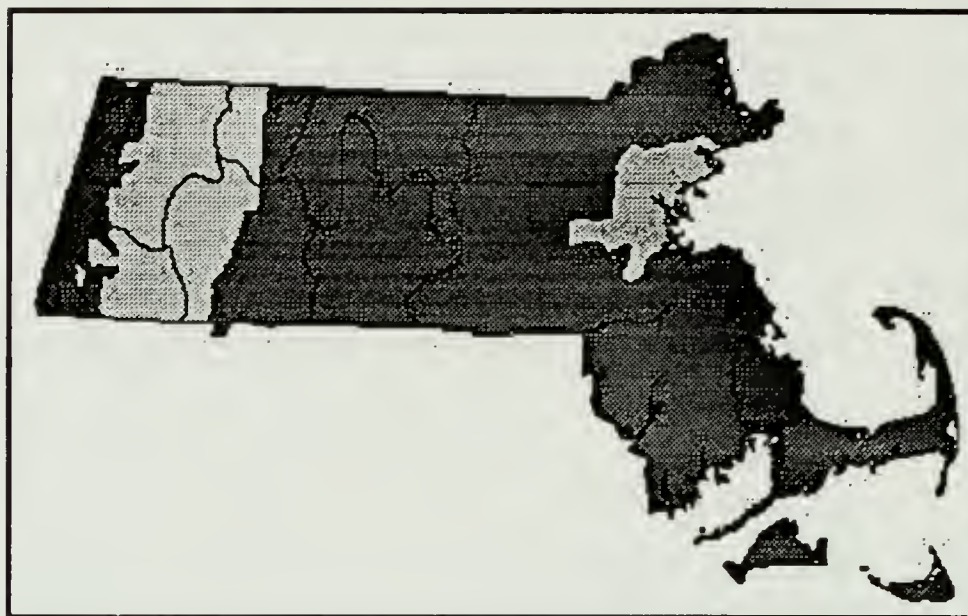
Golet & Larson, 1974:

Other:

Author: J. Kearsley **Date:** 7/21/99

Community Name:
Community ELCODE:
SRANK:
Tracked:

SHRUB SWAMP
CP2A0C0000
S5
No



Concept:

Shrub-dominated wetlands occurring on mineral or mucky mineral soils that are seasonally or temporarily flooded.

Environmental setting:

Shrub swamps are common and widespread. They occur in basin depressions, at pond margins, and along river and streamsides. They can be found in any flat area where the water table is at or above the soil surface for most of the year. Soils are generally well-decomposed organic mucks that are permanently saturated but only seasonally or temporarily inundated. Shrub swamps are often found in the transition zone between emergent marshes and swamp forests. More information is needed on their physical characteristics.

Vegetation Description:

Shrub swamps are highly variable communities that probably can be divided into several types; however, there is currently not enough information available to separate vegetation types. Shrub swamps typically have a mixture of the following shrub species: speckled alder (*Alnus incana* ssp. *rugosa*), smooth alder (*Alnus serrulata*), highbush blueberry (*Vaccinium corymbosum*), meadowsweet (*Spiraea alba* var. *latifolia*), buttonbush (*Cephalanthus occidentalis*), winterberry (*Ilex verticillata*), sweet gale (*Myrica gale*), swamp azalea (*Rhododendron viscosum*), silky dogwood (*Cornus amomum*), northern arrow-wood (*Viburnum dentatum* var. *lucidum*), maleberry (*Lyonia ligustrina*), and the non-native shrub European alder-buckthorn (*Rhamnus frangula*). Scattered red maple (*Acer rubrum*) or gray birch (*Betula populifolia*) saplings also occur. Richer shrub swamps in areas with circumneutral water are often dominated by spicebush (*Lindera benzoin*). Some shrub swamps are dominated by a single species, such as black willow (*Salix nigra*) riverside thickets [which may best be included with floodplain forests], highbush blueberry thickets, or buttonbush swamps. Highbush blueberry thickets that occur on peat are described separately in the peatlands section; with more data, other types may also be split off and described as distinct community types. Since shrubs often form dense thickets, the herbaceous layer of shrub swamps is often sparse and species-poor. A mixture of the following species is typical: common arrowhead (*Sagittaria latifolia* var. *latifolia*), skunk cabbage (*Symplocarpus foetidus*), cinnamon fern (*Osmunda cinnamomea*), sensitive fern (*Onoclea sensibilis*), and royal fern (*Osmunda regalis*), sedges (*Carex* spp.), and Sphagnum spp. moss. More inventory work is needed.

Associations:

No associations have been described in Massachusetts.

**Habitat values for
Associated Fauna:**

Shrub swamps often function as vernal pool habitat in sections that have extended periods of ponding (2-3 months) and lack fish; these sections provide important amphibian breeding habitat.

Associated rare plants:

BIDENS DISCOIDEA

SMALL BEGGAR-TICKS

- WL

SALIX PEDICELLARIS

BOG-WILLOW

- WL

Associated rare animals:

AMBYSTOMA JEFFERSONIANUM	JEFFERSON SALAMAND ER	SC
AMBYSTOMA LATERALE	BLUE-SPOTTED SALAMAND ER	SC
AMBYSTOMA OPACUM	MARBLED SALAMAND ER	T
CLEMMYS GUTTATA	SPOTTED TURTLE	SC
CLEMMYS INSCULPTA	WOOD TURTLE	SC
DESMOCERUS PALLIATUS	ELDERBERRY LONG-HORNED BEETLE	SC
EMYDOIDEA BLAND INGII	BLAND ING'S TURTLE	T
HEMIDACTYLUM SCUTATUM	FOUR-TOED SALAMAND ER	SC
PAPAPEMA SULPHURATA	WATER-WILLOW STEM BORER	T
SCAPHIOPUS HOLBROOKII	EASTERN SPADEFOOT	T
SYNURELLA CHAMBERLAINI	COASTAL SWAMP AMPHIPOD	SC

Examples: parts of 1000 Acre Swamp, Athol and Phillipston.

Threats: Invasion by purple loosestrife (*Lythrum salicaria*).

Management needs: More information is needed to assess the management needs of shrub swamps.

Inventory need rank: 2

Inventory comments: Inventory and vegetation classification needed to describe variants.

Synonyms:

USNVC/TNC: Salix nigra flooded shrubland [CEGL003901]; Alnus incana swamp shrubland [CEGL002381]; Alnus serrulata eastern shrubland [CEGL005082]; Cephalanthus occidentalis semipermanently flooded shrubland [CEGL003908]; Decodon verticillatus semipermanently flooded shrubland [CEGL005089].

MA [old name]: not described separately.

ME: Shrub swamp community, Black willow-alder swamp community.

VT: Alluvial shrub swamp/woodland ; shrub swamp; buttonbush swamp (*kettle basin shrub swamp*).

NH: Shrub swamps.

NY: Shrub swamp.

CT: Salix nigra/Panicum dichotomiflorum community, Alnus rugosa-Salix spp. Community, Alnus rugosa-Cornus amomum-Ilex verticillata community, Cephalanthus occidentalis-Salix sericea community, Cephalanthus occidentalis/Glyceria canadensis community, Decodon verticillatus shrubland s.

RI: Scrub/shrub wetland.

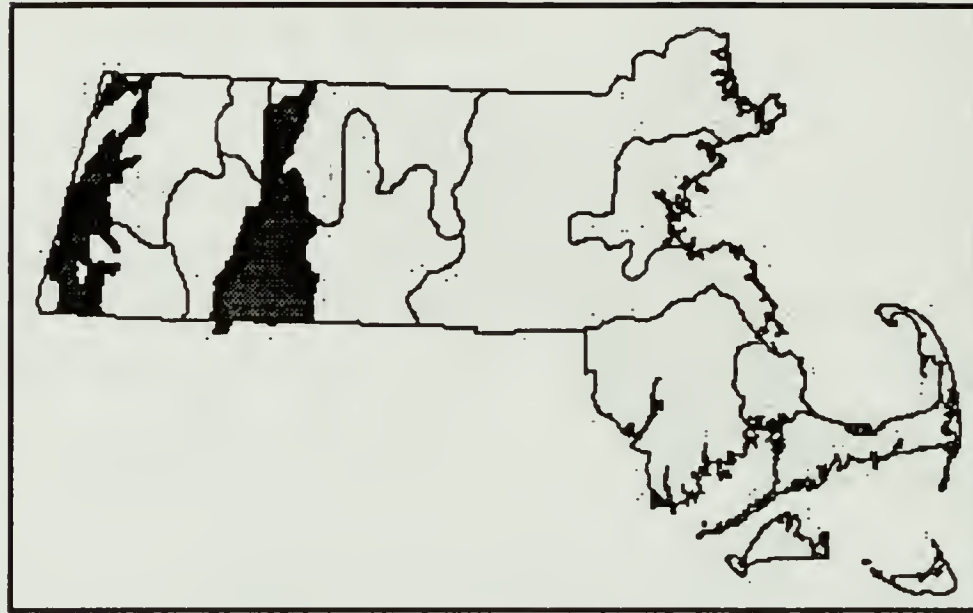
Golet & Larson, 1974: Sapling shrub swamp (SS-1); bushy shrub swamp (SS-2); compact shrub swamp (SS-3); aquatic shrub swamp (SS-4).

Other: Acidic and circumneutral shrub swamps differentiated by Weatherbee (1992) for Berkshire County.

Author: J. Kearsley

Date: 7/21/99

CALCAREOUS SLOPING FEN
CP2B0A1000
S2
Yes



Concept:	Open, sedge-dominated wetlands occurring on slight to moderate slopes where there is calcareous groundwater seepage. Calcareous sloping fens are the most nutrient- and species-rich of the three calcareous fen communities described in Massachusetts. They are rare species "hot spots" with many associated rare plant and animal species.
Environmental setting:	Extremely rich fen communities occurring in areas that are slightly to moderately sloping with calcareous groundwater seepage that is often visible as distinct rivulets. Where there is heavy groundwater discharge, the mineral soil is exposed. There can also be small hummocks of organic matter accumulation. Sites that are more highly disturbed have less woody shrub growth.
Vegetation Description:	Low graminoid/herbaceous communities dominated by sedges, such as inland prickly sedge (<i>Carex interior</i>), delicate sedge (<i>C. leptalea</i>), yellow sedge (<i>C. flava</i>), and porcupine-sedge (<i>C. hystericina</i>). Typical herbaceous associates include grass-of-Parnassus (<i>Parnassia glauca</i>), rough-leaved goldenrod (<i>Solidago patula</i>), fen-goldenrod (<i>S. purshii</i>), and marsh-fern (<i>Thelypteris palustris</i> var. <i>pubescens</i>). There is a sparse tree and shrub cover. Common trees and shrubs include white pine (<i>Pinus strobus</i>), tamarack (<i>Larix laricina</i>), shrubby cinquefoil (<i>Pentaphylloides floribunda</i>), autumn-willow (<i>Salix serissima</i>), and alder-leaf buckthorn (<i>Rhamnus alnifolia</i>).
Associations:	Seven calcareous fen vegetation associations have been described for western New England and adjacent New York state [Motzkin, 1994]. Calcareous sloping fens are equivalent to Motzkin's <i>Carex interior</i> - <i>Carex leptalea</i> - <i>Carex flava</i> type [Group III].
Habitat values for Associated Fauna	Calcareous sloping fens can function as vernal pool habitat if water remains standing for 2-3 months; these sections provide important amphibian breeding habitat. Several state-protected rare turtle species inhabit calcareous sloping fens. Regionally rare ant species are also known to occur in this community type.

CAREX STERILIS	DIOECIOUS SEDGE	T
CAREX TETANICA	FEN SEDGE	SC
CYPRIPEDIUM CALCEOLUS VAR PARVIFLORUM	SMALL YELLOW LADY'S-SLIPPER	E
EQUISETUM SCIRPOIDES	DWARF SCOURING-RUSH	SC
ERIOPHORUM GRACILE	SLENDER COTTONGRASS	T
JUNCUS NODOSUS	- WL	
LOBELIA KALMII	- WL	

PETASITES FRIGIDUS VAR PALMATUS	SWEET COLTSFOOT	T
SALIX CANDIDA	HOARY WILLOW	- WL
SALIX SERISSIMA	AUTUMN WILLOW	- WL
SPIRANTHES ROMANZOFFIANA	HOODED LADIES'-TRESSES	E

Associated rare animals:

CLEMMYS GUTTATA	SPOTTED TURTLE	SC
CLEMMYS INSCULPTA	WOOD TURTLE	SC
CLEMMYS MUHLENBERGII	BOG TURTLE	E
GAMMARUS PSEUDOLIMNAEUS	NORTHERN SPRING AMPHIPOD	SC
STYGOBROMUS BOREALIS	TACONIC CAVE AMPHIPOD	E
WILLIAMSONIA FLETCHERI	EBONY BOGHAUNTER	E

Examples: Several examples in Berkshire County. Massachusetts contains some of the best examples of calcareous fens in New England.

Threats: Changes in groundwater quality and quantity, and any human activities that disturb the vegetation, substrate, or water supply. In disturbed areas, cattails may displace calcium-loving species. Beaver activity threatens calcareous fen communities by altering surface water chemistry. There is evidence to suggest that ponding of water by beaver dams may increase the water's relative acidity possibly due to the accumulation of organic acids or to dilution from acid rain [Motzkin, 1992].

Management needs: Fires, grazing, and /or mowing may be necessary to maintain open fen habitats. More information is needed.

Inventory need rank: 3

Inventory comments: Inventory and classification completed by Glenn Motzkin in 1991.

Synonyms:

USNVC/TNC: Pentaphylloides floribunda/Carex (sterilis, hystericina, flava) shrub herbaceous vegetation [CEGL006326].

MA [old name]: SNE Calcareous sloping fen [CP3A1A1000].

ME: not described.

VT: Rich Fen (Calcareous Fen).

NH: Calcareous Sloping Fen.

NY: Rich Sloping Fen.

CT: Carex interior-Carex leptalea-Carex flava temperate grasslands [Carex sterilis/Potentilla fruticosa community].

RI: not described.

Golet & Larson, 1974:

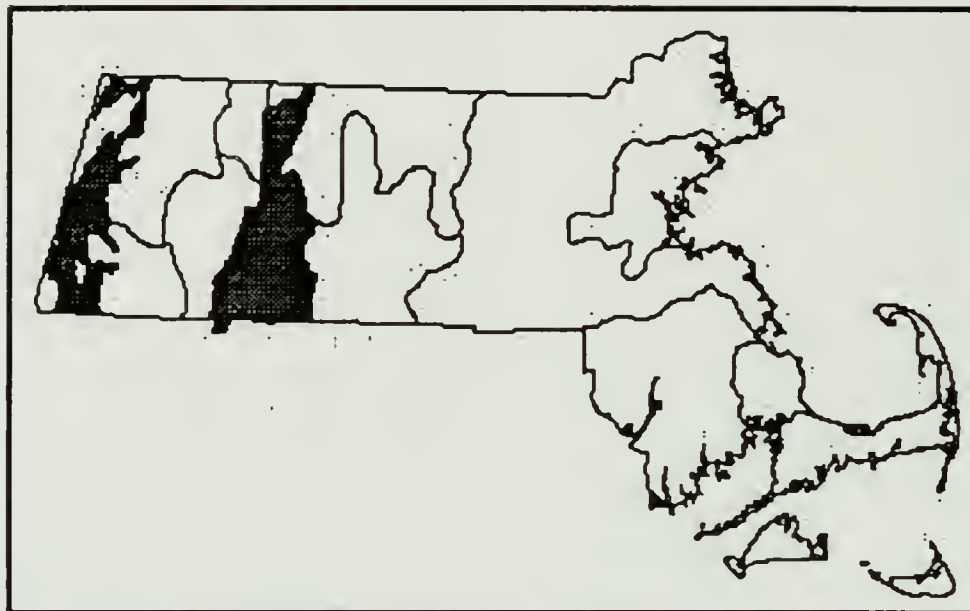
Other: Group III [Motzkin, 1994]; Sloping graminoid fen community [Weatherbee & Crow, 1992, Weatherbee 1996].

Author: J. Kearsley

Date: 7/21/99

Community Name:
Community ELCODE:
SRANK:
Tracked:

CALCAREOUS SEEPAGE MARSH
CP2B0A2000
S2
Yes



Concept: Mixed herbaceous/graminoid/shrub wetlands that experience some calcareous groundwater seepage. Calcareous seepage marshes are intermediate in richness of the three calcareous fen communities described in Massachusetts.

Environmental setting: Marsh community with some calcareous seepage. This community type is found in a variety of physical settings—in basins, in canopy gaps in rich forested swamps, in current or former beaver drainages, or in level to slightly sloping sites associated with sloping fens. There is typically 50-200+ cm of moderate to well-decomposed organic sediments.

Vegetation Description: Open emergent community with scattered shrubs, such as swamp-birch (*Betula pumila*), hoary willow (*Salix candida*), meadowsweet (*Spiraea latifolia*), and poison-sumac (*Toxicodendron vernix*). The herbaceous layer is a mixture of typical marsh species, including marsh sedge (*Carex lacustris*), tussock sedge (*C. stricta*), and marsh fern (*Thelypteris palustris*). Other characteristic species are phragmites (*Phragmites australis*), cat-tails (*Typha angustifolia* and *T. latifolia*), purple loosestrife (*Lythrum salicaria*), Labrador-bedstraw (*Galium labradoricum*), and swamp loosestrife (*Lysimachia thyrsiflora*). Calcareous seepage marshes are distinguished from other emergent marshes by the presence of calciphilic (*calcium-loving*) species, including swamp birch, hoary willow, shrubby cinquefoil (*Pentaphylloides floribunda*), and fen-bedstraw (*Galium labradoricum*).

Associations: Seven calcareous fen vegetation associations have been described for western New England and adjacent New York state [Motzkin, 1994]. Calcareous seepage marshes include four of Motzkin's associations [all grouped in his Group II]: 1. *Betula pumila* type with a well-developed shrub layer, 2. *Carex lacustris* type which lacks extensive woody cover, 3. *Carex stricta* type with higher frequency and cover of *C. stricta*, and 4. *Typha angustifolia*-*Carex lasiocarpa* type which has less *Pentaphylloides floribunda* than the other types.

Habitat values for Associated Fauna: Calcareous seepage marshes can function as vernal pool habitat in sections that have two to three months of ponding and lack fish; these sections provide important amphibian breeding habitat.

Associated rare plants:

BETULA PUMILA	SWAMP BIRCH	T
GALIAM LABRADORICUM	LABRADOR BEDSTRAW	SC
SALIX CANDIDA	HOARY WILLOW	- WL

Associated rare animals:

CLEMMYS GUTTATA	SPOTTED TURTLE	SC
CLEMMYS INSCULPTA	WOOD TURTLE	SC

Examples: Greene Swamp, Sunderland [B] associated with Calcareous seepage swamp and with narrow calcareous sloping fen.

Threats: See description of threats under Calcareous sloping fen.

Management needs: See description of management needs for Calcareous sloping fens.

Inventory need rank: 3

Inventory comments: Inventory and classification completed by Glenn Motzkin in 1991. More information is needed to clarify the relationship between seepage marshes, other marshes, and intermediate fens (including both acidic fens and calcareous basin fens).

Synonyms:

USNVC/TNC: includes *Cornus amomum*-*Salix candida*/*Pentaphylloides floribunda*/*Carex stricta* shrubland [CEGL006359].

MA [old name]: SNE Seepage Marsh [CP3C100000].

ME: not described.

VT: not described.

NH: not described.

NY: similar to Medium fen.

CT: *Potentilla fruticosa*-*Betula pumila*/*Carex lacustris* community.

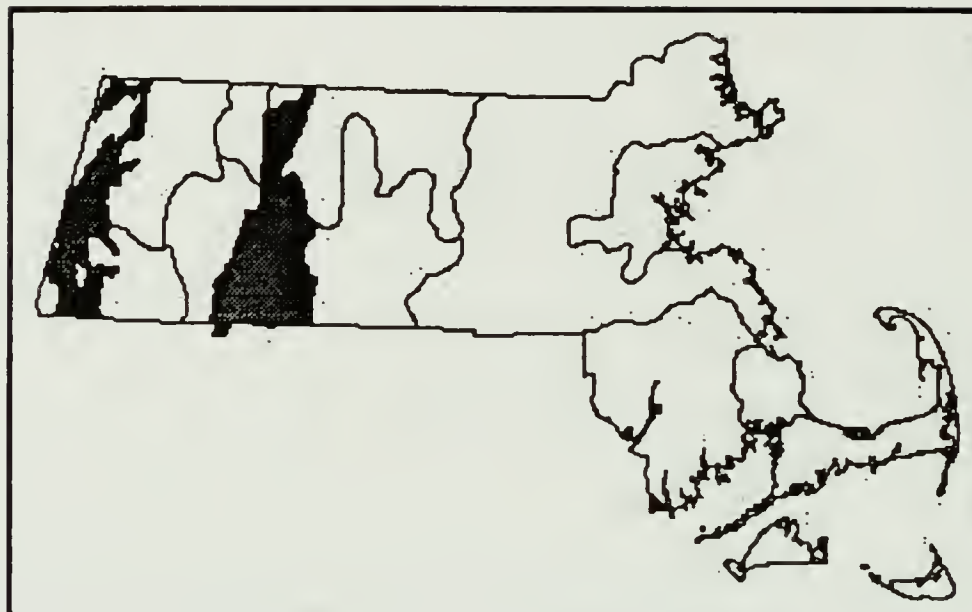
RI: not described.

Golet & Larson, 1974:

Other: Group II [Motzkin, 1994].

Author: J. Kearsley **Date:** 7/21/99

CALCAREOUS BASIN FEN
CP2B0A3000
S1
Yes



Associated rare plants:

CAREX CHORDORRHIZA	CREeping SEDGE	E
SALIX PEDICELLARIS	BOG WILLOW	- WL
SCIRPUS ACUTUS	HARD-STEMMED BULL SEDGE	- WL

Associated rare animals:

CLEMMYS GUTTATA	SPOTTED TURTLE	SC
CLEMMYS INSCULPTA	WOOD TURTLE	SC
WILLIAMSONIA FLETCHERI	EBONY BOGHAUNTER	E

Examples: Kampoosa Bog, Stockbridge.

Threats: See threats under Calcareous sloping fen.

Management needs: See management needs for Calcareous sloping fen.

Inventory need rank: 3

Inventory comments: Inventory and classification completed by Glenn Motzkin in 1991.

Synonyms:

USNVC/TNC: Myrica gale-Pentaphylloides floribunda/Carex lasiocarpa-Cladium mariscoides shrub herbaceous alliance [CEGL006068].

MA [old name]: SNE calcareous basin fen [CP3A1B1000].

ME: similar to Circumneutral fen community.

VT: similar to Intermediate Fen.

NH: Calcareous level fen.

NY: Rich Graminoid Fen.

CT: Carex lasiocarpa-Carex aquatilis community.

RI: not described.

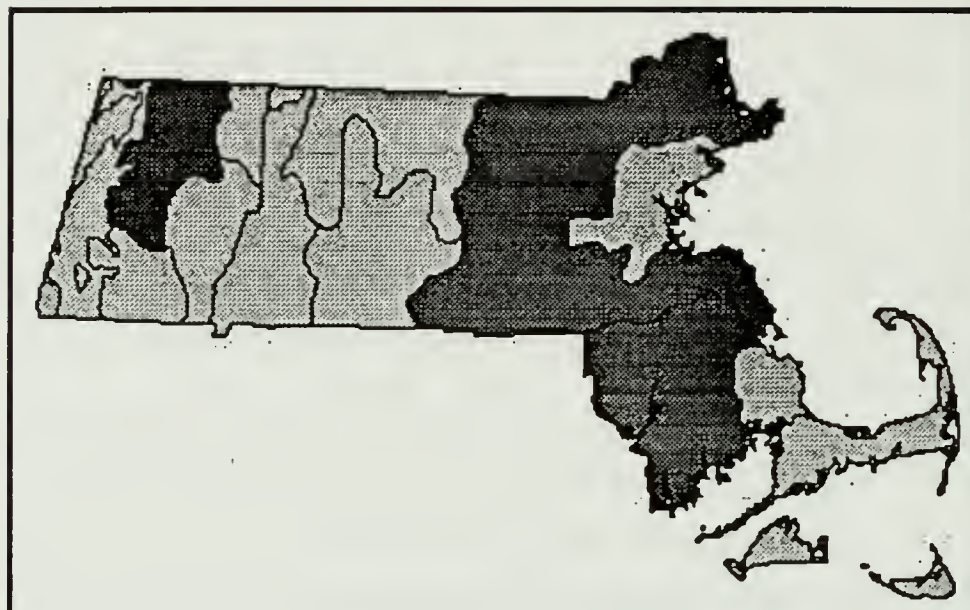
Golet & Larson, 1974:

Other: Group I [Motzkin, 1994].

Author: J. Kearsley

Date: 7/21/99

Community Name: **ACIDIC GRAMINOID FEN**
Community ELCODE: CP2B0B1000
SRANK: S3
Tracked: Yes



- Concept:** Mixed graminoid/herbaceous acidic peatlands that experience some groundwater and /or surface water flow but no calcareous seepage. Shrubs occur in clumps but are not dominant throughout.
- Environmental setting:** Acidic graminoid fens are sedge-/sphagnum-dominated peatlands that are weakly minerotrophic [mineral-rich]. Acidic graminoid fens typically have some surface water inflow and some groundwater connectivity. Inlets and outlets are usually present, and standing water is present throughout much of the growing season. Peat mats are quaking and often unstable. More information is needed on peat characteristics and hydrology.
- Vegetation Description:** Acidic graminoid fens are differentiated from acidic shrub fens by their abundance of graminoid species and lack of extensive leatherleaf (*Chamaedaphne calyculata*) and water-willow (*Decodon verticillatus*). Beaked sedge (*Carex utriculata*) and slender woolly-fruited sedge (*Carex lasiocarpa* var. *americana*) are often dominant. Other good indicator species are white beak-sedge (*Rhynchospora alba*), twig-sedge (*Cladium mariscoides*), and pondshore-rush (*Juncus pelocarpus*). Characteristic herbaceous species include arrow-arum (*Peltandra virginica*) and rose pogonia (*Pogonia ophioglossoides*). Large cranberry (*Vaccinium macrocarpon*) can be abundant. There is patchy tree and shrub cover, including swamp azalea (*Rhododendron viscosum*), sweet pepper-bush (*Clethra alnifolia*), poison sumac (*Toxicodendron vernix*), red maple (*Acer rubrum*), and Atlantic white cedar (*Chamaecyparis thyoides*). Coastal sites also have bayberry (*Myrica pennsylvanica*).
- Associations:** One association has been described in Massachusetts: the *Clethra alnifolia*-*Carex utriculata*-*Carex lasiocarpa* var. *americana* acidic graminoid fen association [TYPE H; described in Kearsley, 1999].
- Habitat values for Associated Fauna:** Acidic graminoid fens can function as vernal pool habitat in sections that have two to three months of ponding and lack fish; these sections provide important amphibian breeding habitat.

Associated rare plants:

ARETHUSA BULBOSA	ARETHUSA	T
CAREX LIMOSA	MUD-SEDGE	- WL
SCIRPUS LONGII	LONG'S BULRUSH	E
XYRIS MONTANA	NORTHERN YELLOW-EYED GRASS	- WL

Associated rare animals:

CISTOTHORUS PALUSTRIS	MARSH WREN	- WL
CLEMMYS GUTTATA	SPOTTED TURTLE	SC
DESMOCERUS PALLIATUS	ELDERBERRY LONG-HORNED BEETLE	SC

EMYDOIDEA BLAND INGII	BLAND ING'S TURTLE	T
PAPAIPEMA APPASSIONATA	PITCHER PLANT BORER MOTH	SC
PAPAIPEMA STENOCELIS	CHAIN FERN BORER MOTH	SC
SYNAPTOMYS COOPERI	SOUTHERN BOG LEMMING	SC
VERTIGO PERRYI	OLIVE VERTIGO	SC
WILLIAMSONIA LINTNERI	RINGED BOGHAUNTER	E

Examples: Grassy Pond, Acton.

Threats: Nutrient enrichment from runoff from roads, lawns, septic systems, and agricultural fields. Other threats are alterations to the natural hydrology and trampling.

Management needs: Cattails appear to proliferate in areas that experience road and /or lawn runoff. Efforts should be made to minimize runoff into these communities.

Inventory need rank: 1

Inventory comments: Given high priority as follow-up to 1998 bog inventory. Also need to look at Scirpus longii sites and potential sea level fens.

Synonyms:

USNVC/TNC: in part Chamaedaphne calyculata/Carex lasiocarpa-Utricularia spp. Shrub Herbaceous Vegetation but no leatherleaf.

MA [old name]: SNE acidic basin fen [CP3A2B1000].

ME: included in Acidic fen community.

VT: similar to Poor fen.

NH: similar to Coastal/southern acidic fen and to Boreal/transitional acidic sloping fen.

NY: includes Inland poor fen and Coastal plain poor fen.

CT: Chamaedaphne calyculata/Carex utriculata var. rostrata community.

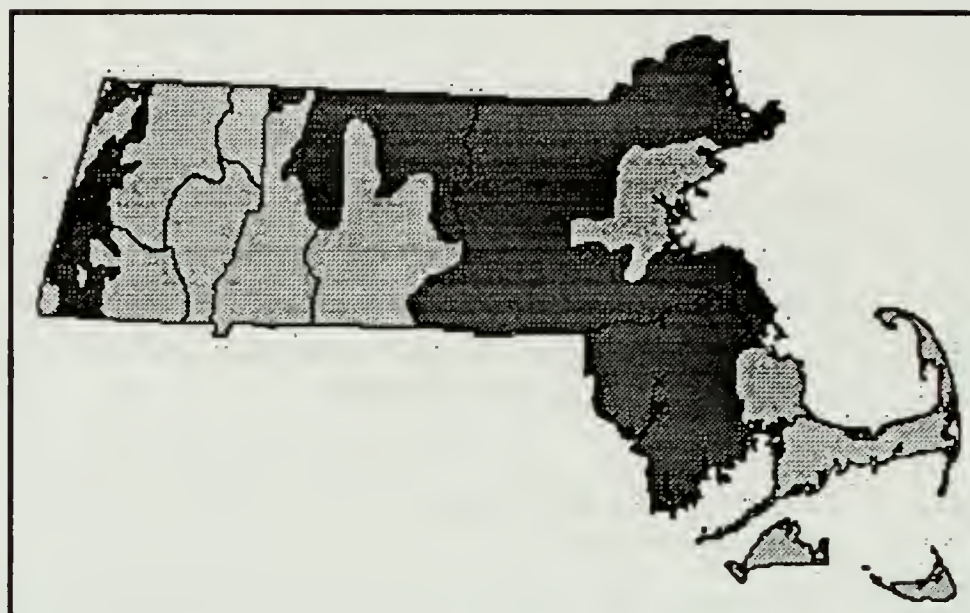
RI: Acidic level fen.

Golet & Larson, 1974:

Other:

Author: J. Kearsley **Date:** 7/21/99

Community Name: **ACIDIC SHRUB FEN**
Community ELCODE: CP2B0B2000
SRANK: S3
Tracked: Yes



- Concept:** Shrub-dominated acidic peatlands characterized by a mixture of primarily deciduous shrubs. Acidic shrub fens experience some groundwater and /or surface water flow but not calcareous seepage.
- Environmental setting:** Acidic shrub fens are less acidic and nutrient-poor than level bogs; they appear to have more surface water inflow and some groundwater connectivity. Acidic shrub fens are typically found along wet pond margins in the eastern half of the state, but they also characterize many wet pond margins in northern Worcester County [e.g. Cheshire and Lincoln Ponds, Ashburnham] and the Berkshires [Horseshoe-Mud Pond Bog, Otis]. More information is needed to identify the physical, geochemical, or hydrological differences between acidic shrub fens and acidic graminoid fens.
- Vegetation Description:** Acidic shrub fens are composed primarily of low-growing, interwoven shrubs with patches of Sphagnum moss growing at the shrub bases. Evergreen and deciduous shrubs occur; typical species include leatherleaf, water-willow (*Decodon verticillatus*), sweet-gale (*Myrica gale*), meadow-sweet (*Spiraea alba* var. *latifolia*), sweet-pepperbush (*Clethra alnifolia*), and alder (*Alnus* spp.). Scattered red maples (*Acer rubrum*) and Atlantic white cedar (*Chamaecyparis thyoides*) can also occur. There is a limited number of herbaceous species, including St. John's-wort (*Hypericum* spp.) and arrow-weed (*Sagittaria* spp.). These associations are similar in structure to dwarf ericaceous shrub bogs, but they are wetter with a less well-developed sphagnum mat.
- Associations:** One association has been described in Massachusetts: the *Decodon verticillatus*-*Chamaedaphne calyculata*-*Myrica gale* acidic shrub fen association [TYPE F; described in Kearsley, 1999].
- Habitat values for Associated Fauna:** Acidic shrub fens can function as vernal pool habitat if water remains standing for 2-3 months; these areas provide important amphibian breeding habitat.
- Associated rare plants:**
NONE KNOWN
- Associated rare animals:**
- | | | |
|--------------------------|-------------------------|----|
| CLEMMYS GUTTATA | SPOTTED TURTLE | SC |
| LITHOPHANE VIRIDIPALLENS | PALE GREEN PINION MOTH | SC |
| PAPAPEMA SULPHURATA | WATER-WILLOW STEM BORER | T |
| WILLIAMSONIA LINTNERI | RINGED BOGHAUNTER | E |
- Examples:** Mud Pond-Horseshoe Pond bog, Otis; Lowell-Dracut State Forest bog, Dracut.

Threats: Hydrological alterations that affect either water quality or quantity threaten the community occurrences and the component species. Nutrient enrichment from surrounding land uses allows less tolerant species to displace low nutrient specialists.

Management needs: Maintaining water quality and quantity are important to all wetland communities.

Inventory need rank: 2

Inventory comments:

Synonyms:

USNVC/TNC: in part *Chamaedaphne calyculata*-(*Gaylussacia dumosa*)-*Decodon verticillatus*/*Woodwardia virginica* dwarf-shrubland ; also in part *Decodon verticillatus* semipermanently flooded shrubland and *Myrica* gale saturated shrubland.

MA [old name]: included in SNE acidic basin fen [CP3A2B1000].

ME: included in Acidic fen community.

VT: similar to Poor fen.

NH: not described.

NY: not described.

CT: not described.

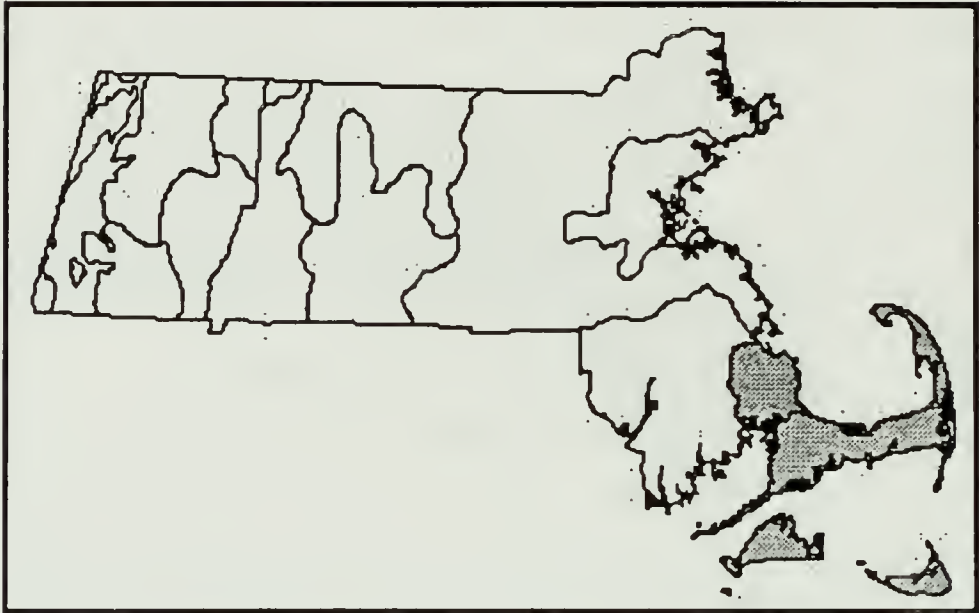
RI: not described.

Golet & Larson, 1974:

Other:

Author: J. Kearsley **Date:** 7/21/99

Community Name: SEA-LEVEL FEN
Community ELCODE: CP2B0B3000
SRANK: S1
Tracked: Yes



Concept: Herbaceous/graminoid peatlands that occur at the upland edges of ocean tidal marshes. The combination of upland freshwater seepage and infrequent salt or brackish overwash produces a mixed plant community of freshwater and estuarine species.

Environmental setting: Sea-level fens occupy the interface between estuarine marshes and upland seepage slopes, and therefore have a distinct species assemblage including both estuarine and palustrine species. There are two hydrologic influences: acidic freshwater seepage from the uplands and periodic salt or brackish overwash from the adjacent marsh. Both are needed to produce the combination of species observed in sea-level fens.

Vegetation Description: Probable community type in Massachusetts, but vegetation descriptions are lacking. There are two probable occurrences reported from Martha's Vineyard that have saltmarsh spike-sedge (*Eleocharis rostellata*) co-occurring with acidic fen species. Plot data are needed. Ludwig (1995) described the flora of sea-level fens from Virginia, Delaware, New York, and Connecticut. He described three diagnostic species: saltmarsh straw-sedge (*Carex hormathodes*), saltmarsh spike-sedge (*Eleocharis rostellata*), and saltmarsh-threesquare (*Scirpus americanus*). Other common species include: New York aster (*Aster novi-belgii*), twig-sedge (*Cladium mariscoides*), spatulate-leaved sundew (*Drosera intermedia*), Canada rush (*Juncus canadensis*), pondshore-rush (*Juncus pelocarpus*), swamp-candles (*Lysimachia terrestris*), common reed (*Phragmites australis*), white beak-sedge (*Rhynchospora alba*), swamp-rose (*Rosa palustris*), common threesquare (*Scirpus pungens*), poison ivy (*Toxicodendron radicans*), and marsh St. John's-wort (*Triadenum virginicum*). [State Historical, deceitful spike-sedge (*Eleocharis fallax*) listed as common in more southern occurrences.]

Associations: No associations have been described in Massachusetts.

Habitat values for Associated Fauna: More information is needed.

Associated rare plants:

ELEOCHARIS FALLAX	DECEITFUL SPIKE-SEDGE	H
ELEOCHARIS ROSTELLATA	BEAKED SPIKE-SEDGE	- WL

Associated rare animals:

METARRANTHIS PILOSARIA	COASTAL SWAMP METARRANTHIS MOTH	SC
VERTIGO PERRYI	OLIVE VERTIGO	SC

Examples: Possible on Martha's Vineyard and Buzzard's Bay.

Threats: Alteration to the natural hydrologic regime. Development in the uplands may have negative effects on upland seepage.

Management needs: Maintain natural hydrology and upland buffer.

Inventory need rank: 1

Inventory comments:

Synonyms:

USNVC/TNC: Cladium mariscoides-Drosera intermedia-Eleocharis rostellata herbaceous vegetation [CEGL006310].

MA [old name]: not described.

ME: not described.

VT: not described.

NH: not described.

NY: Sea-level fen.

CT: Cladium mariscoides-Drosera intermedia-Eleocharis rostellata community?

RI: Sea-level fen.

Golet & Larson, 1974:

Other:

Author: J. Kearsley **Date:** 7/21/99

Community Name: **LEVEL BOG**
Community ELCODE: CP2B0C1000
SRANK: S3
Tracked: Yes



Concept: Acidic dwarf ericaceous shrub peatlands, generally with pronounced hummock-hollow topography. Level bogs are the most acidic and nutrient-poor of Massachusetts' peatland communities.

Environmental setting: Level bog communities receive little or no streamflow and they are isolated from the water table, making them the most acidic and nutrient-poor of peatland communities. The pH of level bogs is in the range of 3 to 4. Level bogs develop along pond margins, at the headwaters of streams, or in isolated valley bottoms without inlet or outlet streams.

Vegetation Description: Level bogs are characterized by a mixture of tall and short shrubs that are predominantly ericaceous (i.e. members of the Heath family). Leatherleaf (*Chamaedaphne calyculata*) is dominant. Other typical ericaceous shrubs include rhodora (*Rhododendron canadense*), sheep laurel (*Kalmia angustifolia*), bog laurel (*Kalmia polifolia*), bog rosemary (*Andromeda polifolia* var. *glaucophylla*), Labrador tea (*Ledum groenlandicum*), and low-growing large and small cranberry (*Vaccinium macrocarpon* and *V. oxycoccus*). Scattered, stunted coniferous trees, primarily tamarack (*Larix laricina*) and black spruce (*Picea mariana*), occur throughout. A mixture of specialized bog plants grow on the hummocky Sphagnum surface, including carnivorous pitcher plants (*Sarracenia purpurea*) and sundews (*Drosera rotundifolia* and *D. intermedia*).

Associations: Five associations have been described in Massachusetts. They are: 1. *Vaccinium corymbosum*-*Rhododendron viscosum* tall shrub bog and bog border association [TYPE A in Kearsley, 1999], 2. *Vaccinium corymbosum*-*Rhododendron canadense*-*Ledum groenlandicum* tall shrub bog association [TYPE B in Kearsley, 1999], 3. A *Chamaedaphne calyculata*-*Kalmia polifolia*-*Maianthemum trifolium* dwarf ericaceous shrub bog association [TYPE C in Kearsley, 1999], 4. *Chamaedaphne calyculata* dwarf ericaceous shrub bog association [TYPE D], and 5. *Vaccinium oxycoccus*-*Rhynchospora alba*-*Utricularia cornuta* open sphagnum lawn association [TYPE E].

Habitat values for Associated Fauna: The high acidity and low oxygen content of the water make level bogs inhospitable to many reptiles, fish, and amphibians. However, several of the state's protected rare animal species are found in level bogs. Moats or pools associated with level bogs can provide important amphibian breeding habitat and function as vernal pools if they have two to three months of ponding and lack fish.

Associated rare plants:

ARCEUTHOBIMUM PUSILLUM	DWARF MISTLETOE	SC
CAREX LIMOSA	MUD-SEDGE	- WL
SCHEUCHZERIA PALUSTRIS	POD-GRASS	T
XYRIS MONTANA	NORTHERN YELLOW-EYED GRASS	- WL

Associated rare animals:

AESHNA MUTATA	SPATTERDOCK DARNER	E
AMBYSTOMA JEFFERSONIANUM	JEFFERSON SALAMANDER	SC
AMBYSTOMA LATERALE	BLUE-SPOTTED SALAMANDER	SC
LITHOPHANE VIRIDIPALLENS	PALE GREEN PINION MOTH	SC
METARRANTHIS PILOSARIA	COASTAL SWAMP METARRANTHIS MOTH	SC
PAPAPEMA APPASSIONATA	PITCHER PLANT BORER MOTH	SC
WILLIAMSONIA FLETCHERI	EBONY BOGHAUNTER	E
WILLIAMSONIA LINTNERI	RINGED BOGHAUNTER	E

Examples: Ponkapoag Bog Reservation MDC, Canton; Poutwater Pond, Sterling.

Threats: Hydrologic alteration and nutrient enrichment from road and lawn runoff. Trampling from humans affects peat mat integrity.

Management needs: Public should be encouraged to visit only those sites with established boardwalks. Signs need to be posted along boardwalks encouraging visitors to stay off the peat mat. Monitor the impact of salt and other nutrient runoff into bogs, and work to minimize runoff. Remove phragmites where it has become established.

Inventory need rank: 3

Inventory comments: Site visits should be made to 71 sites identified in 1998 bog inventory that were not visited in '98.

Synonyms:

USNVC/TNC: includes *Vaccinium corymbosum*/Sphagnum spp. Shrubland ; *Picea mariana*/*Kalmia angustifolia*/Sphagnum spp. Forest; *Picea mariana*/Sphagnum spp. (Lower New England /Northern Piedmont, North Atlantic Coast) Woodland ; *Kalmia angustifolia*-*Chamaedaphne calyculata* (*Picea mariana*)/*Cladina* dwarf-shrubland.

MA [old name]: SNE Level Bog [CP2C2A0000].

ME: Dwarf shrub bog community.

VT: Dwarf shrub bog.

NH: similar to Coastal/southern dwarf shrub bog and to Boreal/transitional dwarf shrub bog.

NY: Dwarf shrub bog.

CT: *Chamaedaphne calyculata* dwarf shrubland s.

RI: Dwarf shrub bog.

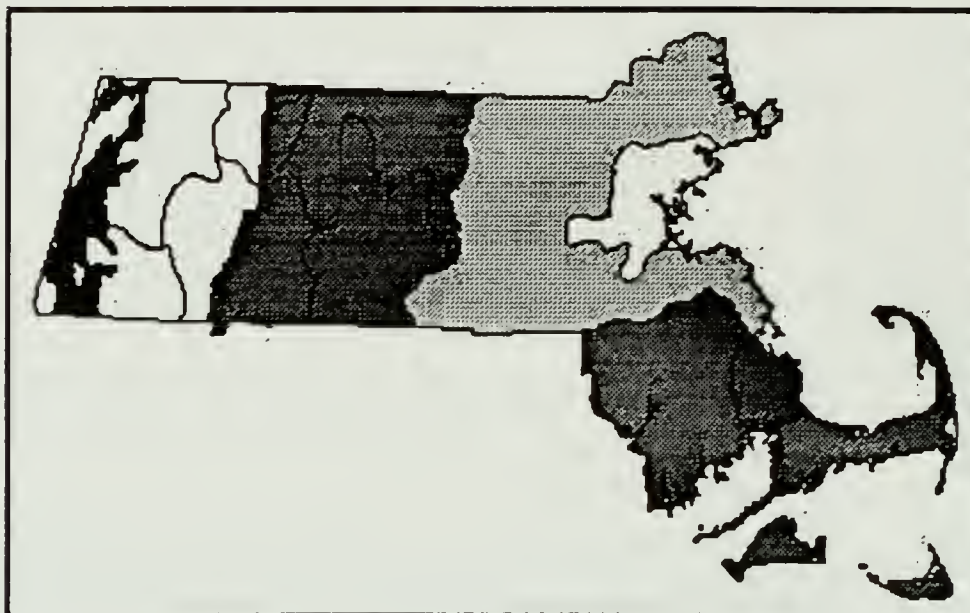
Golet & Larson, 1974:

Other:

Author: J. Kearsley

Date: 7/21/99

Community Name: **KETTLEHOLE LEVEL BOG**
Community ELCODE: CP2B0C1100
SRANK: S2
Tracked: Yes



Concept: A variant of level bogs occurring in kettle depressions in sandy glacial outwash. Vegetation is typically zoned in rings.

Environmental setting: Kettlehole level bogs are a subset of level bogs that occur in iceblock depressions (*commonly called kettleholes*) in sandy glacial outwash. They are typically small (< 3 acres), round, and they lack inlets and outlets.

Vegetation Description: Kettlehole level bogs have similar vegetation to level bogs, except that the vegetation is typically in a ringed zonation pattern. Often the outer wet moat is dominated by a mixture of highbush blueberry (*Vaccinium corymbosum*) and swamp azalea (*Rhododendron viscosum*) bordered to the interior by a ring of rhodora (*Rhododendron canadense*). The mat has a mixture of tall and short shrubs that are predominantly ericaceous (members of the Heath family). Leatherleaf (*Chamaedaphne calyculata*) is dominant. Other typical ericaceous shrubs include rhodora, sheep laurel (*Kalmia angustifolia*), bog laurel (*Kalmia polifolia*), bog rosemary (*Andromeda polifolia* var. *glaucophylla*), Labrador tea (*Ledum groenlandicum*), and low-growing large and small cranberry (*Vaccinium macrocarpon* and *V. oxycoccus*). Scattered, stunted coniferous trees, primarily tamarack (*Larix laricina*) and black spruce (*Picea mariana*) occur throughout. A mixture of specialized bog plants grow on the hummocky sphagnum surface, including carnivorous pitcher plants (*Sarracenia purpurea*) and sundews (*Drosera rotundifolia* and *D. intermedia*). Many of the kettlehole bogs observed in the state have drier and more stable sphagnum mats than level bogs not in kettleholes, and they have abundant bog laurel and three-leaved Solomon's seal (*Maianthemum trifolium*).

Associations: One association has been described in Massachusetts: the *Chamaedaphne calyculata*-*Kalmia polifolia*-*Maianthemum trifolium* dwarf ericaceous shrub bog association [TYPE C in Kearsley, 1999].

Habitat values for Associated Fauna: Moats surrounding kettlehole level bogs can function as vernal pool habitat if water remains standing for 2-3 months and they lack fish; these areas provide important amphibian breeding habitat.

Associated rare plants:

MAIANTHEMUM TRIFOLIUM	THREE-LEAVED SOLOMON'S SEAL	- WL
-----------------------	-----------------------------	------

Associated rare animals:

AMBYSTOMA JEFFERSONIANUM	JEFFERSON SALAMANDER	SC
AMBYSTOMA LATERALE	BLUE-SPOTTED SALAMANDER	SC
CLEMMYS GUTTATA	SPOTTED TURTLE	SC
LITHOPHANE VIRIDIPALLENS	PALE GREEN PINION MOTH	SC
PAPAPEMA APPASSIONATA	PITCHER PLANT BORER MOTH	SC

Examples: Arcadia bog, Belchertown.

Threats: Hydrologic alteration and nutrient enrichment from road and lawn runoff. Trampling from humans affects peat mat integrity.

Management needs: Public should be encouraged to visit only those sites with established boardwalks. Signs need to be posted along boardwalks encouraging visitors to stay off the peat mat. Monitor the impact of salt and other nutrient runoff into bogs, and work to minimize runoff. Remove phragmites where it has become established.

Inventory need rank: 3

Inventory comments:

Synonyms:

USNVC/TNC: includes *Vaccinium corymbosum*/Sphagnum spp. Shrubland ; *Picea mariana*/*Kalmia angustifolia*/Sphagnum spp. Forest; *Picea mariana*/Sphagnum spp. (Lower New England /Northern Piedmont, North Atlantic Coast) Woodland ; *Kalmia angustifolia*-*Chamaedaphne calyculata* (*Picea mariana*)/*Cladina* dwarf-shrubland.

MA [old name]: included in SNE level bog [CP2C2A0000].

ME: similar to Dwarf shrub bog community.

VT: included in Dwarf shrub bog.

NH: included in Coastal/southern dwarf shrub bog and Boreal/transitional dwarf shrub bog.

NY: included in Dwarf shrub bog.

CT: *Chamaedaphne calyculata* dwarf shrubland s.

RI: included in Dwarf shrub bog.

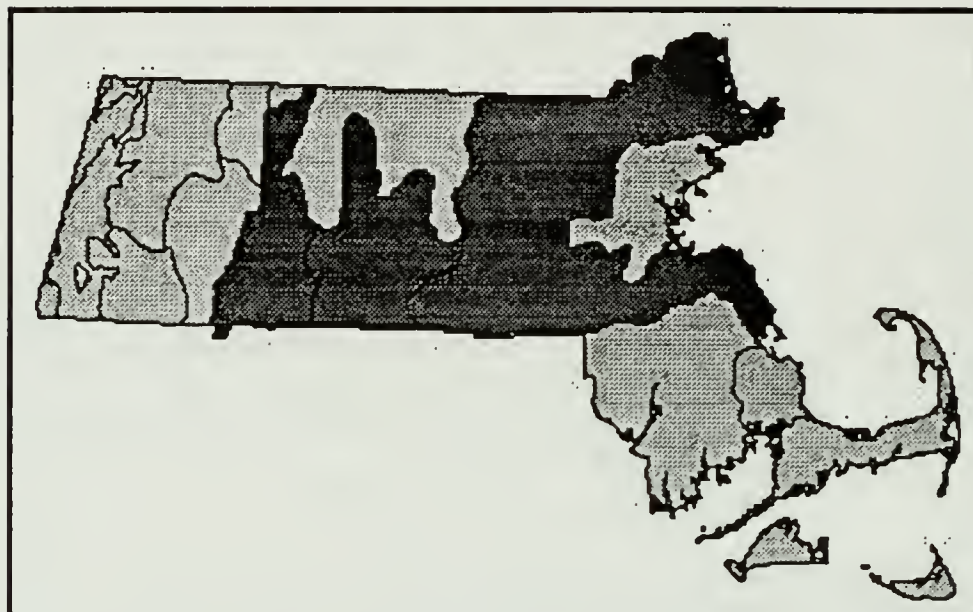
Golet & Larson, 1974:

Other:

Author: J. Kearsley **Date:** 7/21/99

Community Name:
Community ELCODE:
SRANK:
Tracked:

HIGHBUSH BLUEBERRY THICKET
CP2B0C2000
S4
No



- Concept:** Acidic peatlands dominated by dense highbush blueberry bushes on hummocky sphagnum moss.
- Environmental setting:** Highbush blueberry thickets appear to occur in areas that are wetter and more mineral- enriched than dwarf shrub level bog communities. Tall shrub thickets are generally flooded in spring and early summer, but water levels drop below the soil surface by late summer or early fall. The sphagnum mat is variable; it can be patchy and unstable or thick and stable. Many of the known examples occupy kettleholes.
- Vegetation Description:** Highbush blueberry thickets are tall shrub peatlands dominated by dense highbush blueberries (*Vaccinium corymbosum*). Swamp azalea (*Rhododendron viscosum*) is a common associate, and typical short shrubs include sheep laurel (*K. angustifolia*), leatherleaf (*Chamaedaphne calyculata*), and huckleberry (*Gaylussacia dumosa*). Sphagnum moss can form a continuous and stable mat beneath the shrubs, or it can be localized on small hummocks at the base of the shrubs.
- Associations:** One association has been described in Massachusetts: the *Vaccinium corymbosum*-*Rhododendron viscosum* tall shrub bog and bog border association [TYPE A in Kearsley, 1999].
- Habitat values for Associated Fauna:** Moats of wet, ponded areas associated with highbush blueberry thickets can function as vernal pool habitat if water remains standing for 2-3 months; these areas provide important amphibian breeding habitat.
- Associated rare plants:**
- | | | |
|-----------------------|-----------------------------|------|
| MAIANTHEMUM TRIFOLIUM | THREE-LEAVED SOLOMON'S SEAL | - WL |
|-----------------------|-----------------------------|------|
- Associated rare animals:**
- | | | |
|--------------------------|--------------------------|----|
| AMBYSTOMA JEFFERSONIANUM | JEFFERSON SALAMAND ER | SC |
| AMBYSTOMA LATERALE | BLUE-SPOTTED SALAMAND ER | SC |
| CLEMMYS GUTTATA | SPOTTED TURTLE | SC |
| HEMIDACTYLIUM SCUTATUM | FOUR-TOED SALAMAND ER | SC |
- Examples:** several kettlehole highbush blueberry thickets in Belchertown.
- Threats:** Hydrologic alterations and nutrient enrichment from road and lawn runoff may impact this community. More information is needed.
- Management needs:** More information is needed.
- Inventory need rank:** 2

Inventory comments: Probably common, but statewide inventory and vegetation classification needed.

Synonyms:

USNVC/TNC: Vaccinium corymbosum/Sphagnum spp. shrubland [CEGL006190].

MA [old name]: not described.

ME: similar to Peatland lagg community.

VT: not described or included in Shrub swamp.

NH: included within Shrub swamp.

NY: Highbush blueberry bog thicket.

CT: Vaccinium corymbosum-Rhododendron viscosum community, Vaccinium corymbosum/Osmunda cinnamomea community.

RI: included in scrub/shrub wetland.

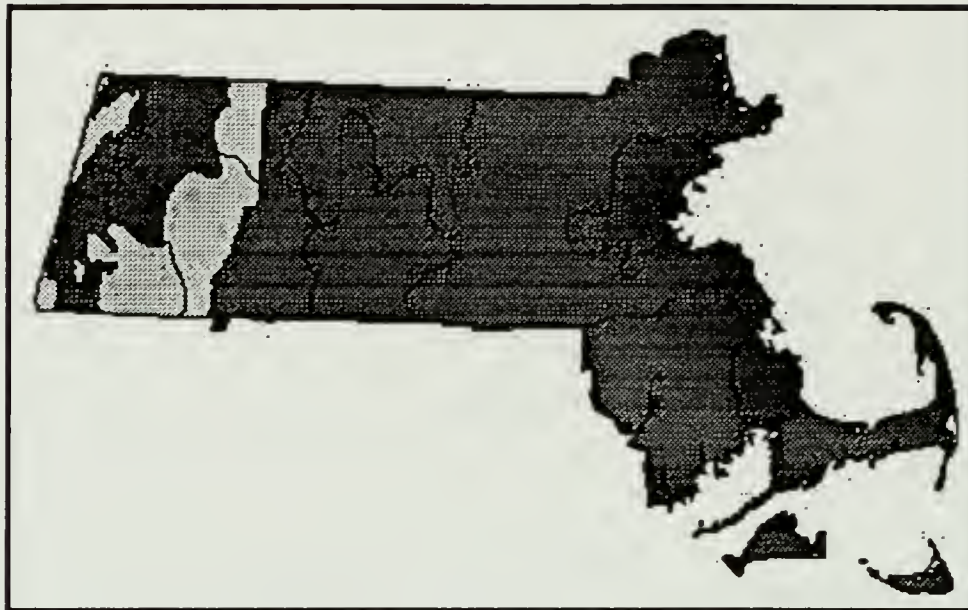
Golet & Larson, 1974:

Other:

Author: J. Kearsley **Date:** 7/21/99

Community Name:
Community ELCODE:
SRANK:
Tracked:

WOODLAND VERNAL POOL
CP30000000
S3
Yes



Concept: Small, shallow depressions within upland forest that are temporarily flooded and provide important breeding habitat for amphibians.

Environmental setting: Woodland vernal pools are small, shallow depressions that are isolated from other surface waters. They flood in the spring and sometimes in the fall, but they are typically dry in the summer. They often have hydric soils. When dry, woodland vernal pools can often be recognized by a layer of stained leaves covering the dry depression.

Vegetation Description: Woodland vernal pools often have little or no vegetation, but they are ringed by upland trees or shrubs, such as sweet pepperbush (*Clethra alnifolia*). Other forested and non-forested wetland community types can function as vernal pool habitat if they have long periods of standing water, i.e. 2-3 months. See habitat values description under other community descriptions.

Associations: No associations have been described in Massachusetts.

Habitat values for Associated Fauna: Vernal pools are tracked as a separate community type because of the important habitat they provide for amphibians and invertebrates. Since vernal pools are temporary bodies of water, they do not support fish populations. Wood frogs (*Rana sylvatica*), Eastern spadefoot toads (*Scaphiopus holbrookii*), and four local species of mole salamanders (*Ambystoma* spp.) have evolved breeding strategies intolerant of fish predation on their eggs and larvae; the lack of fish populations is essential to the breeding success of these species. Other amphibian species use vernal pools but they do not depend on them; those species include American Toads (*Bufo americanus*), Green Frogs (*Rana clamitans*), and Red-spotted Newts (*Notophthalmus viridescens*). Vernal pools also support a diverse invertebrate fauna, including fairy shrimp (*Eubrachipus* spp.) which complete their entire life cycle in vernal pools.

Associated rare plants:

NONE KNOWN

Associated rare animals:

AMBYSTOMA JEFFERSONIANUM	JEFFERSON SALAMAND ER	SC
AMBYSTOMA LATERALE	BLUE-SPOTTED SALAMAND ER	SC
AMBYSTOMA OPACUM	MARBLED SALAMAND ER	T
CLEMMYS GUTTATA	SPOTTED TURTLE	SC
CLEMMYS INSCULPTA	WOOD TURTLE	SC
EMYDOIDEA BLAND INGII	BLAND ING'S TURTLE	T
EUBRANCHIPUS INTRICATUS	INTRICATE FAIRY SHRIMP	SC

EULIMNADIA AGASSIZII	AGASSIZ'S CLAM SHRIMP	E
HEMIDACTYLUM SCUTATUM	FOUR-TOED SALAMANDER	SC
LIMNADIA LENTICULARIS	AMERICAN CLAM SHRIMP	SC

Examples: Boxford State Forest and Wildlife Management Area have abundant vernal pools.

Threats: Woodland vernal pools are often overlooked during the dry season, so they end up being destroyed by filling or grading. They are often too small to meet minimum size requirements for state wetland protections. Hydrologic alterations also threaten vernal pool communities.

Management needs: Inventory is needed to identify where woodland vernal pools are. Protection of surrounding uplands is important for vernal pool species.

Inventory need rank: 2

Inventory comments: 1800 vernal pools are currently certified in the state.

Synonyms:

USNVC/TNC: not described.

MA [old name]: Vernal pool.

ME: Vernal pool community.

VT: Vernal woodland pool.

NH: Vernal woodland pool.

NY: Vernal pool.

CT: not described.

RI: not described.

Golet & Larson, 1974:

Other:

Author: J. Kearsley

Date: 7/21/99

DRAFT

**Descriptions of
Estuarine Communities**

DRAFT

**Classification of the
Natural Communities
of
Massachusetts**

ESTUARINE COMMUNITIES

MARINE

Marine Subtidal:

Flats.....	E - 2
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Marine Intertidal:

Rocky Shore	E - 4
Gravel / Sand Beach.....	E - 6
Flats.....	E - 8

ESTUARINE

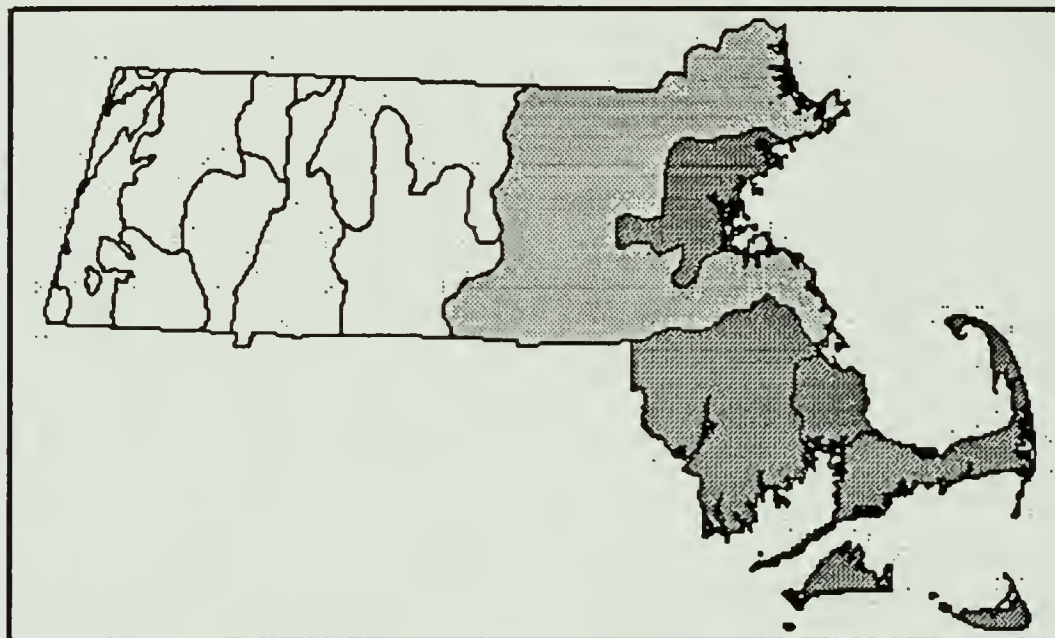
Estuarine Subtidal:

Saline / Brackish Flats.....	E - 10
Fresh / Brackish Flats.....	E - 12
Coastal Salt Pond	E - 14

Estuarine Intertidal:

Saline / Brackish Flats.....	E - 16
Fresh / Brackish Flats.....	E - 18
Coastal Salt Pond Marsh	E - 20
(Palustrine) Sea-level Fen.....	E - 22
Salt Marsh	E - 24
Brackish Tidal Marsh.....	E - 26
Freshwater Tidal Marsh.....	E - 28
Fresh / Brackish Tidal Shrubland.....	E - 30
Fresh / Brackish Tidal Swamp	E - 32

Community Name: **MARINE SUBTIDAL: FLATS**
 Community CODE: CM1A000000
 SRANK: S4
 Tracked: No



Concept: Sparsely to densely vegetated communities, dominated by invertebrates. Permanently submerged saline communities that occur in open ocean or near shore.

Environmental setting: Permanently flooded by ocean water. Sandy to muddy nearshore shallow water and offshore banks.

Vegetation Description: May include beds of eelgrass (*Zostera marina*). Other plants are macro- and micro-algae.

Associations:

Habitat Values for Associated Fauna: Water over flats are important feeding areas for gulls, terns, diving ducks, and other water birds, and many winter in Massachusetts waters feeding on eelgrass and/or the fish in it. Brandt (*Branta bernicla*) are particularly dependent on four foot deep eelgrass, and feed on it in Massachusetts waters in the winter. Eelgrass beds are key nursery areas for larval and juvenile fish. Loggerheads (*Caretta caretta*) and Atlantic Ridley (*Lepidochelys kempii*) sea turtles use deep Marine Subtidal Flats in Cape Cod Bay.

Associated rare plants:
 NONE KNOWN

Associated rare animals:

CARETTA CARETTA	LOGGERHEAD	T
LEPIDOCHELYS KEMPII	ATLANTIC RIDLEY	E

Examples with Public Access: Billingsgate Shoals Wildlife Sanctuary, Wellfleet.

Threats:

Management needs:

Inventory need rank:

Inventory comments:

Synonyms:

USNVC/TNC: Includes: *Zostera marina* Permanently flooded - Tidal Herbaceous Alliance – *Zostera marina* Herbaceous Vegetation [Provisional] [CEGL004336].

MA (old name): Southern New England & Gulf of Maine Saline/ Brackish Subtidal Estuarine Community.
ME: Marine - Mud bottom community.
NH: Possible, not described.
NY: Includes Marine - Eel grass meadow.
CT: Includes *Zostera marina* Hydromorphic Vegetation.
RI: Brackish intertidal mud flat.

Other:

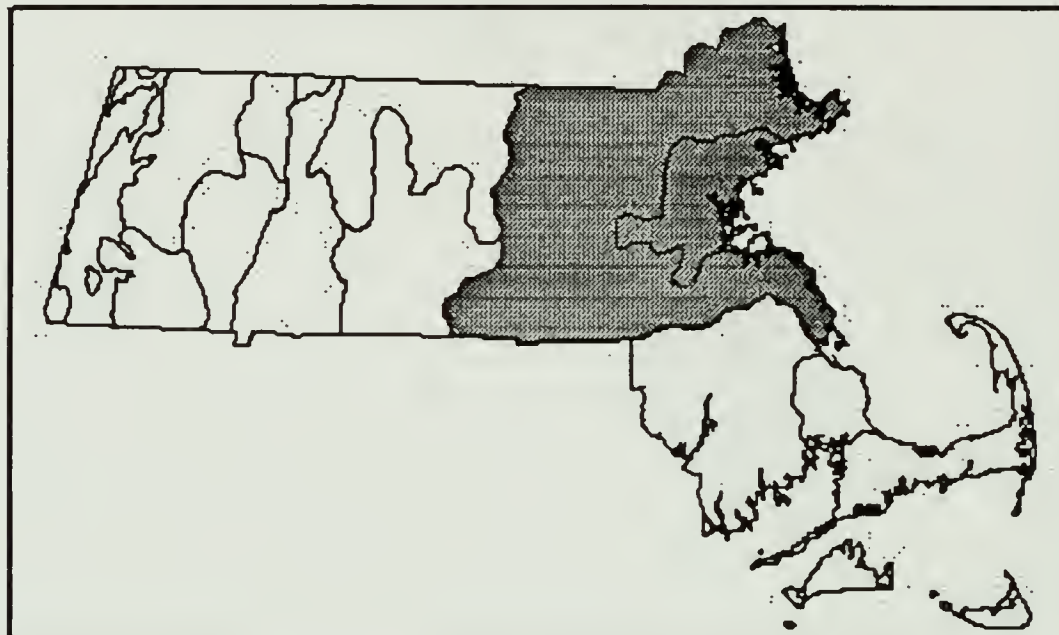
Author:

P. Swain

Date:

1/1/00

Community Name: **MARINE INTERTIDAL: ROCKY SHORE**
 Community CODE: CM2A000000
 SRANK: S2
 Tracked: No



Concept: A community dominated by invertebrates and non-vascular plants, in a high-stress environment alternately covered by tides and exposed to desiccation and thermal stress.

Environmental setting: Along rocky shores, from the supratidal splash zone to the limits of light penetration in the subtidal zone.

Vegetation Description: The communities of rocky shores are dominated by crustaceans, mollusks, and macroscopic algae. The algae (seaweed) provide cover and food for the animals. The rocky shore community shows a distinct zonation from the splash zone to the zone of complete inundation.

Associations:

Habitat Values for Associated Fauna: This was probably the habitat of the extinct sea mink (*Mustela vison macrodon*). Wintering sea birds such as Northern Gannets (*Morus bassanus*) and Great Cormorants (*Phalacrocorax carbo*) feed among submerged rocks close to shore. Wintering Purple Sandpipers (*Calidris maritima*) forage among exposed rocks in low tide. The habitat includes tidal pools which support many marine invertebrates.

Associated rare plants:
 NONE KNOWN

Associated rare animals:
 NONE KNOWN

Examples with Public Access: Halibut Point State Park, Rockport.

Threats:

Management needs:

Inventory need rank:

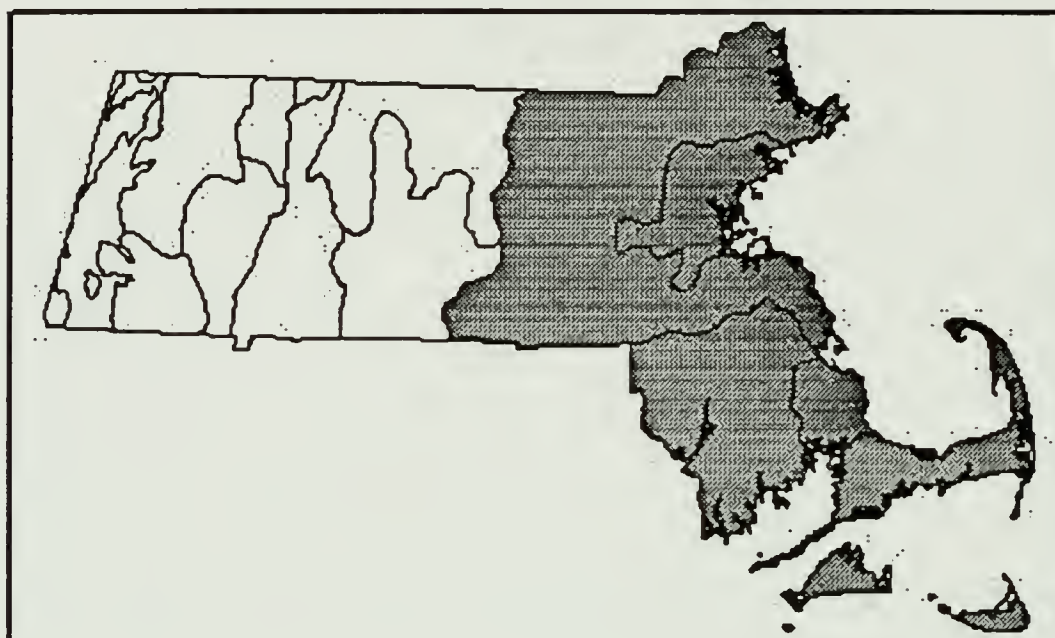
Inventory comments:

Synonyms:

USNVC/TNC: [Nonvascular Sparse vegetation]

MA (old name): Southern New England/Gulf of Maine Rocky Intertidal Community
ME: Marine: Intertidal bedrock / boulder community..
NH:
NY: Marine rocky intertidal.
CT:
RI: Marine intertidal Rocky Shore.
Other:
Author: P. Swain **Date:** 1/1/00

Community Name: MARINE INTERTIDAL: GRAVEL / SAND BEACH
 Community CODE: CM2B000000
 SRANK: S4
 Tracked: No



Concept: Invertebrates and nonvascular plants dominate the organisms of this highly stressed community in the intertidal (wave action) zone of beaches.

Environmental setting: Marine beaches exposed between high tides: below the wrack line and above the permanent water. These are high energy habitats. Beach strand communities above the high tide line support sparse vascular plants. Marine subtidal communities occur below the low tide line.

Vegetation Description: Sparse non-vascular plants. Invertebrates are the most abundant group.

Associations:

Habitat Values for Associated Fauna: Many shorebirds, such as Sanderlings (*Calidris alba*), Least Sandpipers (*C. minutilla*), Semipalmated Sandpipers (*C. pusilla*), and Semipalmated Plover (*Charadrius semipalmatus*), forage along shorelines during migrations. Part of important resting areas for shorebirds when exposed. Piping plovers (*Charadrius melodus*) nest on the beach strand and forage in the wrack line. Gulls (*Larus* spp.) are ubiquitous in all shore and shallow water environments. Tiger beetles also forage on exposed portions of the intertidal beach. Few mammals use this portion of the beach for more than passing through.

Associated rare plants:

NONE KNOWN

Associated rare animals:

CHARADRIUS MELODUS	PIPING PLOVER	T
CICINDELA DORSALIS DORSALIS	NORTHEASTERN BEACH TIGER BEETLE	E

Examples with Public Access: Cape Cod National Seashore; Monomoy NWR, Orleans and Chatham; Horseneck Beach, Westport; Parker River NWR, Newbury.

Threats: Disturbance of resting birds by domestic animals and people, and off road vehicles.

Management needs:

Inventory need rank: 3

Inventory comments:

Synonyms:

USNVC/TNC: sand, non-vegetated.

MA (old name): Southern New England/Gulf of Maine Intertidal High Energy Sand / Gravel Beach.

ME: Marine: sand beach community and gravel/ cobble beach community.

NH:

NY: Marine intertidal gravel/sand beach.

CT:

RI: Marine intertidal gravel/ sand beach.

Other:

Author: P. Swain

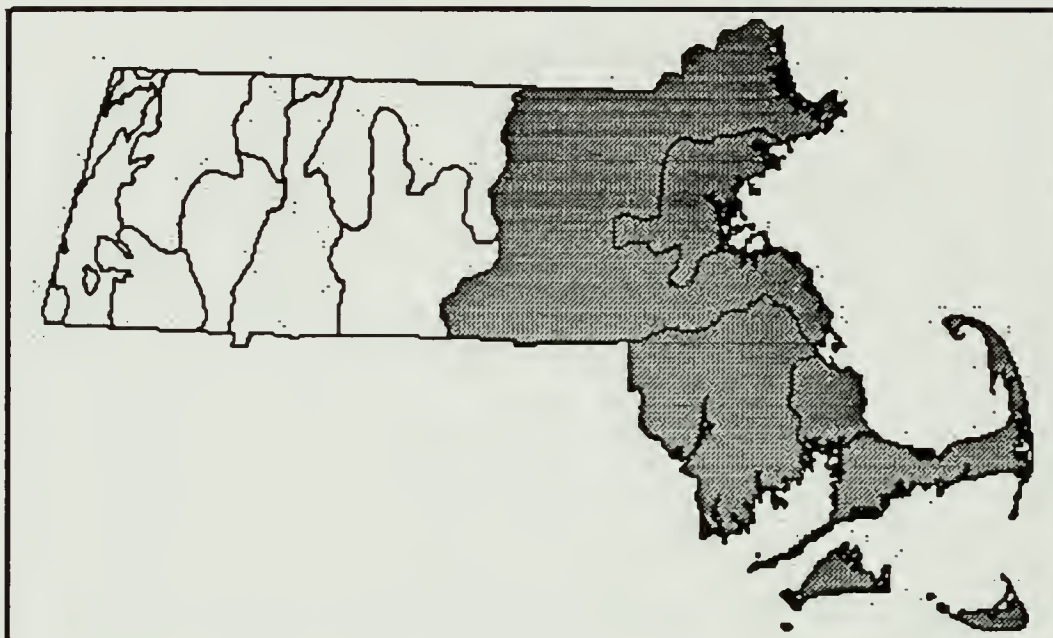
Date: 1/1/00

Community Name: MARINE INTERTIDAL: FLATS

Community CODE: CM2C000000

SRANK: S4

Tracked: No



Concept: Marine intertidal areas protected from intense wave action, with relatively stable sediments, in various proportions of silt, clay, sand, and organic materials.

Environmental setting: Found in protected, low-energy coastal sites, such as bays and coves behind headlands or barrier beaches, between low and high tidal limits. More protected than Marine intertidal gravel/sand beaches. Marine intertidal flats are sometimes bordered by salt marshes on the landward side and tidal channels or subtidal eelgrass beds on the seaward side. Tidal flats are physically and biologically linked to other coastal marine systems; organisms of tidal flats depend upon organic materials brought in from adjacent coastal, estuarine, riverine, and salt marsh habitats.

Vegetation Description: Includes some areas with eelgrass (*Zostera marina*), but other areas are sparsely vegetated. Invertebrate species richness can be high. Mud areas tend to have a higher productivity than sand or gravel areas. Micro-algae are abundant.

Associations:

Habitat Values for Associated Fauna: Habitat is used by many of the same species as use the intertidal gravel/sand beaches: Sanderlings (*Calidris alba*), Least Sandpipers (*C. minutilla*), Semipalmated Sandpipers (*C. pusilla*), Stilt Sandpiper (*C. himantopus*), Greater Yellowlegs (*Tringa melanoleuca*), Black-bellied Plover (*Pluvialis squatarola*), and Semipalmated Plover (*Charadrius semipalmatus*) for foraging and staging during migrating. Resting areas for water birds when exposed. Habitat for polychaetes, snails, clams, oysters, sand dollars, and other invertebrates. Coastal and estuarine fishes migrate over tidal flats during high tides and feed on organisms in and on the sediments. During high tides, terns and water birds fish over flats. Mammals, reptiles, and amphibians do not seek out this habitat.

Associated rare plants:

NONE KNOWN

Associated rare animals:

NONE KNOWN

Examples with Public Access: Nauset Beach; Chatham Beach; Merrimack River mouth, Newburyport.

Threats:

Management needs:

Inventory need rank:

Inventory comments:

Synonyms:

USNVC/TNC: Non-vegetated.

MA (old name): Southern New England / Gulf of Maine Intertidal Low Energy Mud Flats.

ME: Marine: Intertidal mud flat community.

NH:

NY: Marine intertidal mud flats [mostly invertebrates].

CT:

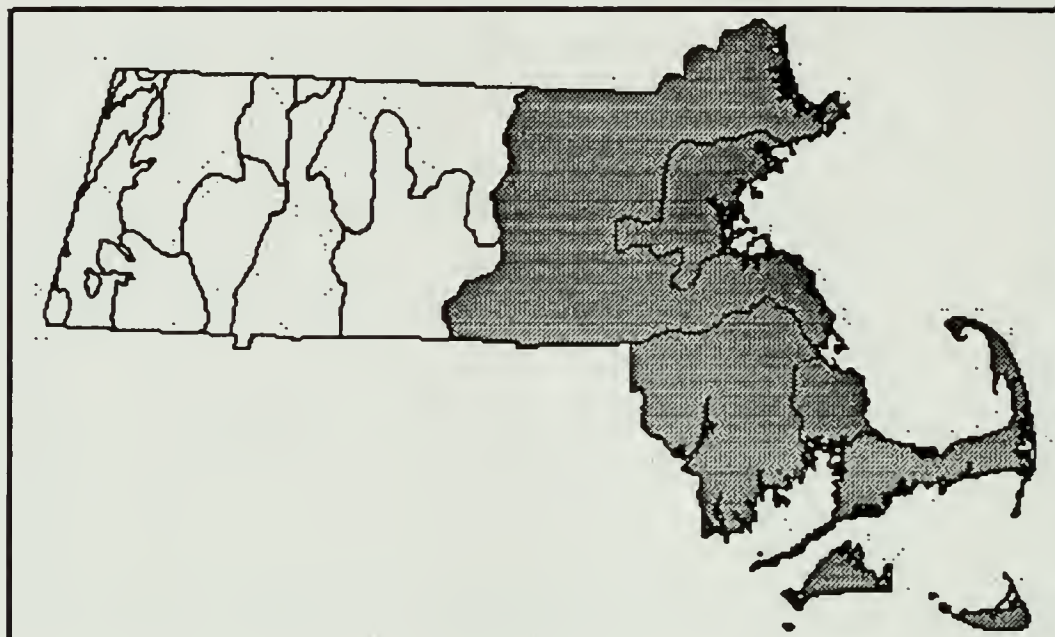
RI: Marine intertidal mud flat.

Other:

Author: P. Swain

Date: 6/9/99

Community Name: ESTUARINE SUBTIDAL: SALINE/ BRACKISH FLATS
Community CODE: CE3A100000
SRANK: S4
Tracked: No



- Concept:** Estuarine areas not exposed between tides, generally without emergent vegetation. Areas less than two meters deep sometimes support submerged or floating plants.
- Environmental setting:** Includes beds of tidal creeks draining salt marshes and river mouths. The salinity of the water changes with the tides and flow of rivers or streams. Actual species present at any place depend on salinity, water temperature, depth, and substrate type. More protected than Marine subtidal communities.
- Vegetation Description:** Eel grass (*Zostera marina*) and widgeon grass (*Ruppia maritima*) may form dense beds. Waterweed (*Elodea nuttallii*), coontail (*Ceratophyllum demersum*), sago pondweed (*Potamogeton pectinatus*), and horned pondweed (*Zannichellia palustris*) may be mixed in or form locally dense beds. Macroalgae [seaweeds] can be locally dense. Invertebrates vary with substrate and depth.
- Associations:**
- Habitat Values for Associated Fauna:** Submerged vegetation provides winter feeding sites for waterfowl including Brandt (*Branta bernicla*) and American Black Duck (*Anas rubripes*), and sea birds. Vascular plant beds also provide habitat for larval and juvenile fishes and surfaces for attachment of invertebrates including shellfish. Fish such as Alewife (*Alosa pseudoharengus*), American shad (*A. sapidissima*), and Striped bass (*Morone saxatilis*) are characteristic of estuarine subtidal habitats.
- Associated rare plants:**
NONE KNOWN
- Associated rare animals:**
NONE KNOWN
- Examples with Public Access:**
- Threats:**
- Management needs:**
- Inventory need rank:**

Inventory comments:

Synonyms:

USNVC/TNC: *Zostera marina* Permanently flooded - Tidal Herbaceous Alliance – *Zostera marina* Herbaceous Vegetation [Provisional] [CEGL004336]; *Ruppia maritima* Permanently Flooded - Tidal Temperate Herbaceous Alliance – *Ruppia maritima* Acadian, Virginian Zone Herbaceous Vegetation [CEGL006167].

MA (old name): Southern New England & Gulf of Maine Saline/ Brackish Subtidal Estuarine Communities.

ME: Marine - Mud bottom community; Tidal creek community.

NH: Possible, not described.

NY: Marine subtidal, eelgrass meadow; Tidal creek – Widgeon grass; Brackish subtidal aquatic bed.

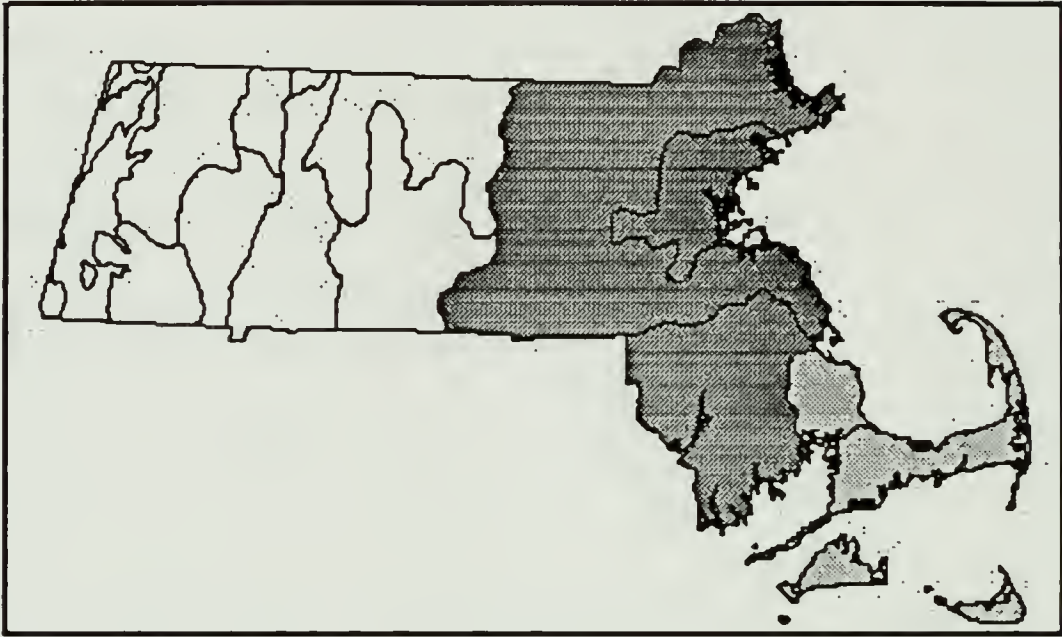
CT: *Zostera marina* Hydromorphic Vegetation.

RI: Brackish intertidal mud flat; Tidal creek – Widgeon grass.

Other:

Author: P. Swain **Date:** 6/11/99

Community Name: ESTUARINE SUBTIDAL: FRESH / BRACKISH FLATS
Community CODE: CE3A200000
SRANK: S2
Tracked: No



Concept: Permanently flooded freshwater to brackish areas subject to tidal fluctuations. Aquatic beds form where water is less than two meters at low tide.

Environmental setting: Permanently flooded upper reaches of estuaries, including upper reaches of tidal creeks. Such areas tend to be warmer and shallower than closer to the river mouth, as well as less saline. Shores lined by Freshwater or Brackish Tidal Marshes. Seldom closed by ice.

Vegetation Description: Sago pondweed (*Potamogeton pectinatus*), horned pondweed (*Zannichellia palustris*), tapegrass (*Vallisneria americana*), and naiads (*Najas guadalupensis* and *N. minor*) are characteristic vascular plants.

Associations:

Habitat Values for Associated Fauna: Fish such as Alewife (*Alosa pseudoharengus*), American shad (*Alosa sapidissima*), and Striped bass (*Morone saxatilis*) are characteristic. Invertebrates include Horseshoe crabs (*Limulus polyphemus*) and mud crabs (such as *Neopanope texana*). Gulls forage year round, and in winter waterfowl and eagles are common.

Associated rare plants:
NONE KNOWN

Associated rare animals:
LAMPETRA APPENDIX AMERICAN BROOK LAMPREY T

Examples with Public Access:

Threats:

Management needs:

Inventory need rank:

Inventory comments:

Synonyms:

USNVC/TNC: Potamogeton pectinatus - Zannichellia palustris Permanently Flooded - Tidal Herbaceous Alliance
– Potamogeton pectinatus - Zannichellia palustris Permanently Flooded - Tidal Herbaceous
Vegetation [CEGL006027].

MA (old name): Southern New England & Gulf of Maine Fresh /Brackish Subtidal Estuarine Communities.

ME: Estuarine community: subtidal estuary community.

NH: Possible, not described.

NY: Includes Estuarine intertidal, Brackish subtidal aquatic bed; Fresh subtidal aquatic bed.

CT: Includes Vallisneria americana Hydromorphic Vegetation.

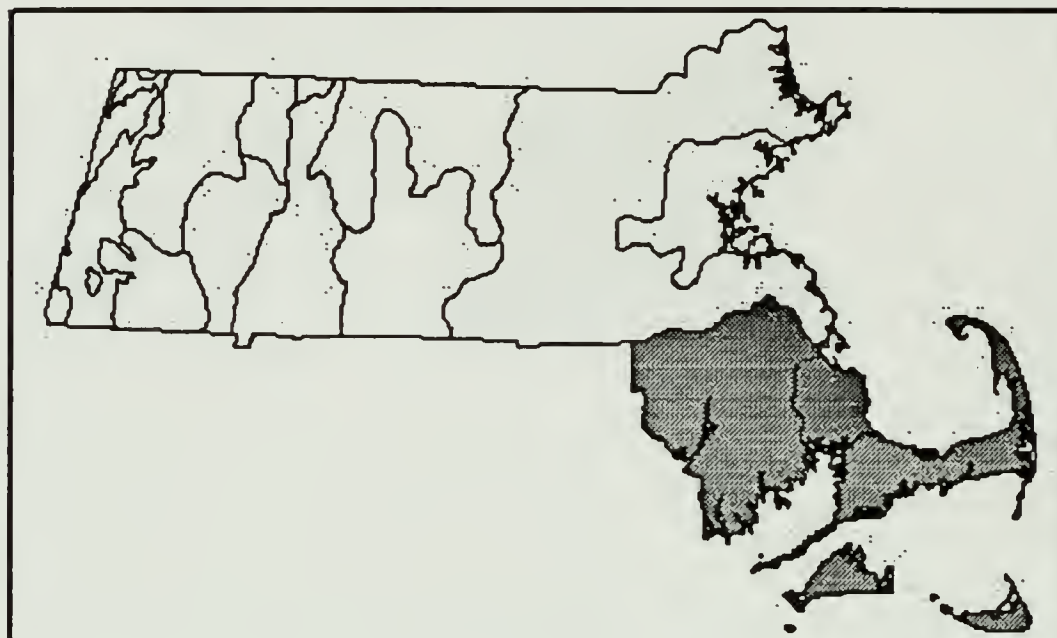
RI: Includes Brackish subtidal Aquatic Bed; Fresh subtidal aquatic bed.

Other:

Author: P. Swain

Date: 6/13/99

Community Name: ESTUARINE SUBTIDAL: COASTAL SALT POND
 Community CODE: CE3B000000
 SRANK: S2
 Tracked: Yes



Concept: The vegetation surrounding and in coastal saline to brackish ponds with shallow water. The inland ends tend to be fresher, with denser, taller vegetation developing.

Environmental setting: Salt ponds are found on the south and east sides of Cape Cod, Martha's Vineyard, Nantucket, and in Buzzards Bay. The ponds are more or less isolated from the ocean by sand spits that cut off a bay. When closed, the ponds tend to be brackish and have little tidal action. The spit may become broken by storms or human intervention and reclose by drifting sand. Water levels fluctuate when the ponds are closed to the ocean, with freshwater inflow from streams and rain maintaining the levels. Shorelines often support marsh areas that are similar to brackish salt marshes. Sea-level fens are very restricted areas within the marshes.

Vegetation Description: Eelgrass (*Zostera marina*) beds are often dominant communities of the subtidal areas. Other areas may not be vegetated. Towards the ocean, mud or sand shores appear during dry spells that support mud flat species such as mudwort (*Limosella australis*), dwarf spikerush (*Eleocharis parvula*), seaside flatsedge (*Cyperus filicinus*), seaside crowfoot (*Ranunculus cymbalaria*), false pimpernel (*Lindernia dubia*), waterwort (*Elatine minima*) and shore pygmy-weed (*Crassula aquatica*). The vegetation of inland ends is similar to the landward, brackish, portions of other salt marshes, with beds of narrow-leaved cattail (*Typha angustifolia*), common reed (*Phragmites australis*), freshwater cord-grass (*Spartina pectinata*), saltmarsh switchgrass (*Panicum virgatum* var. *spissum*), bulrushes (*Scirpus* spp. Particularly *S. pungens*), and mock bishop's-weed (*Ptilimnium capillaceum*).

Associations:

Habitat Values for Associated Fauna: Eel (*Anguilla rostrata*), alewife (*Alosa pseudoharengus*), and white perch (*Bairdiella chrysura*) are typical fish. Important for shell fish beds.

Associated rare plants:

CRASSULA AQUATICA	PYGMYWEED	T
HYDROCOTYLE VERTICILLATA	SALTPOND PENNYWORT	SC

Associated rare animals:

NONE KNOWN

Examples with Public Access: Sesachacha Pond, Nantucket; Allen's Pond, Dartmouth; Long Pond, Tisbury.

Threats: Artificially maintaining ponds open or closed. The increasingly invasive Mute Swan (*Cygnus olor*) is becoming more abundant and displacing native species.

Management needs:

Inventory need rank:

Inventory comments:

Synonyms:

USNVC/TNC: *Zostera marina* Permanently flooded - Tidal Herbaceous Alliance – *Zostera marina* Herbaceous Vegetation [Provisional] [CEGL004336]; Includes *Scirpus pungens* Tidal Herbaceous Alliance - *Scirpus pungens* - *Eleocharis parvula* Herbaceous Vegetation [CEGL006398].

MA (old name): Coastal Salt Pond

ME: Marine - Mud bottom community part of Marine - Salt Pond Community.

NH: Similar to Coastal salt pond marsh.

NY: Marine eelgrass meadow, coastal salt pond.

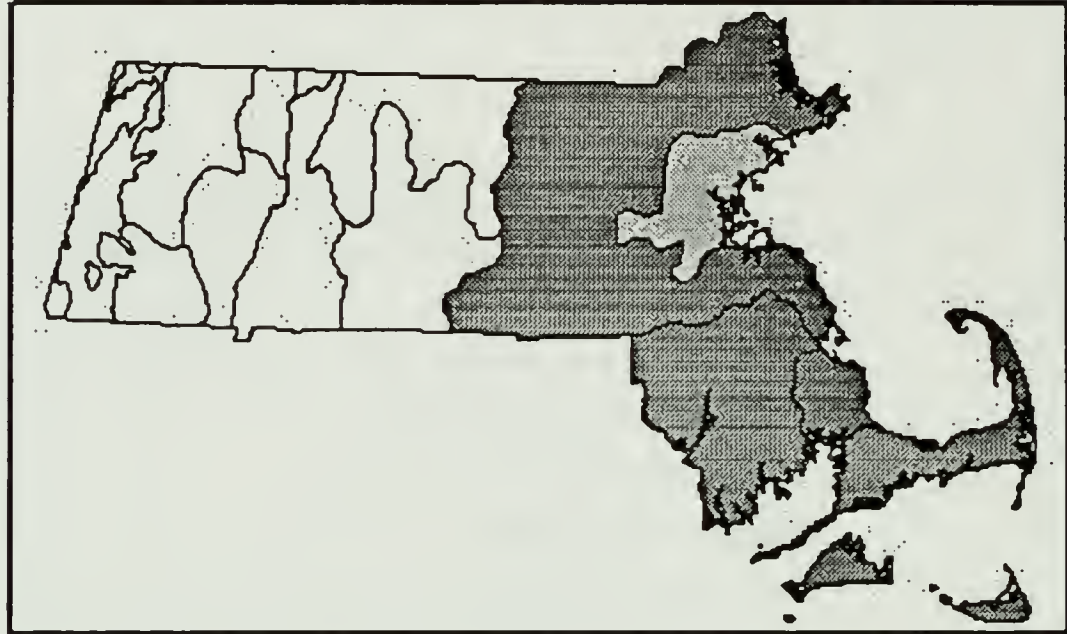
CT: Likely present, not named.

RI: Brackish subtidal aquatic bed (eelgrass); part of Coastal salt pond.

Other:

Author: P. Swain **Date:** 6/13/99

Community Name: ESTUARINE INTERTIDAL: SALINE /BRACKISH FLATS
Community CODE: CE2A100000
SRANK: S3
Tracked: No



Concept: Non-organic substrates exposed between tides with sparse vegetation.

Environmental setting: Lower estuarine areas exposed between high tides, covered with brackish or saline water at high tide. Flats accumulate in areas sufficiently quiet for sediments to accumulate. Species are patchy. Grades into Brackish Tidal Marsh, mud flat zone, which has more organic sediments.

Vegetation Description: Sparsely vegetated with patches of predominately rosette leaved aquatics such as riverbank quillwort (*Isoetes riparia*), river arrowhead (*Sagittaria subulata*), saltpond spike-rush (*Eleocharis parvula*), and Atlantic mudwort (*Limosella australis*). Patches of algae and eelgrass (*Zostera marina*) can also occur. The plants are completely submerged at high tide and usually coated with mud.

Associations:

Habitat Values for Associated Fauna: Gulls and shorebirds feed on flats at low tide, American Black Duck (*Anas rubripes*), other diving ducks, and other water birds feed on flooded flats. Polychaetes, snails, clams, and amphipods are abundant in mud and sand flats. Essentially the same fauna as on marine intertidal flats.

Associated rare plants:
 NONE KNOWN

Associated rare animals:
 NONE KNOWN

Examples with Public Access: Flats in Brewster, Cape Cod Bay, and Joppa Flats, Merrimack River mouth.

Threats:

Management needs:

Inventory need rank:

Inventory comments:

Synonyms:

USNVC/TNC: Isoetes riparia tidal sparsely Vegetated Alliance – Isoetes riparia Tidal Sparse Vegetation [CEGL006058]; Sagittaria subulata - Limosella australis Tidal Herbaceous Alliance – Sagittaria subulata - Limosella australis Tidal Herbaceous Vegetation [CEGL004473].

MA (old name): Southern New England/Gulf of Maine Saline/ Brackish Intertidal flat; Southern New England/Gulf of Maine Fresh/ Brackish Subtidal Estuarine Community.

ME: Intertidal mud flat community Intertidal sand - gravel flat community; Estuarine - Brackish tidal marsh community, mudflat zone, Intertidal mud flat community, Intertidal sand - gravel flat community.

NH: Possible, not described

NY: Marine intertidal mud flats (mostly invertebrates); Estuarine intertidal, Brackish intertidal mudflats.

CT: Sagittaria subulata - Zannichellia palustris community.

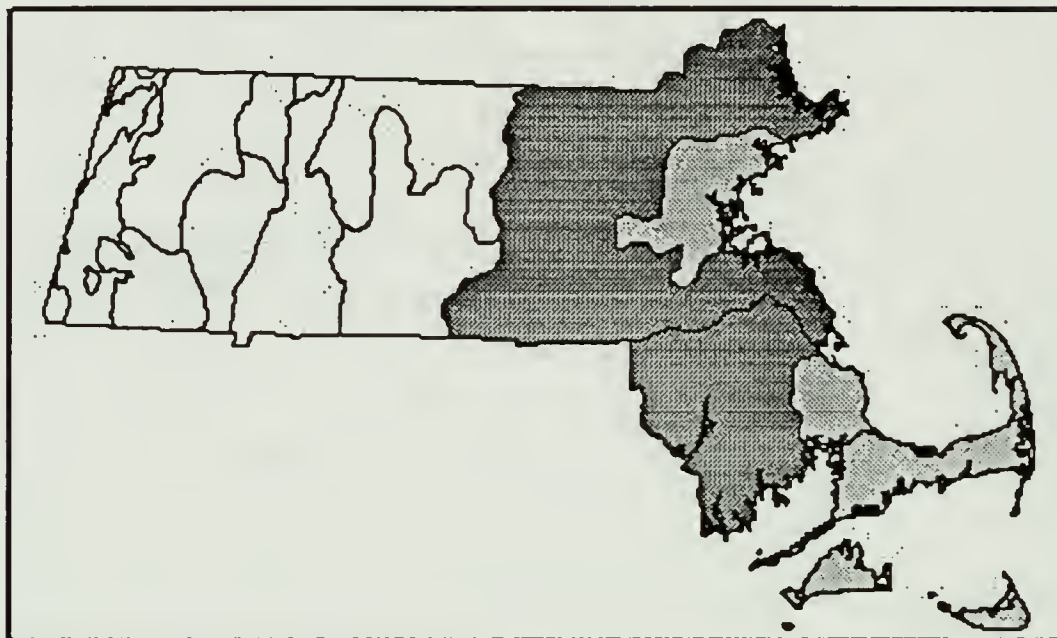
RI: Marine intertidal mud flat.

Other:

Author: J. Lundgren

Date: 6/13/99

Community Name: ESTUARINE INTERTIDAL: FRESH / BRACKISH FLATS
Community CODE: CE2A200000
SRANK: S2
Tracked: No



Concept: A sparsely vegetated community occurring on exposed intertidal flats where plants are completely submerged under about a meter of freshwater at high tide.

Environmental setting: Exposed intertidal mudflats where water is fresh, grading into Freshwater Tidal Marsh, mud flat zone where organic sediments have accumulated.

Vegetation Description: Plants are predominately low growing rosette-leaved aquatics, with the lowest leaves characteristically coated with mud. False pimpernel (*Lindernia dubia*), Arrowheads (*Sagittaria subulata*, *S. graminea*, and *S. rigida*), beggar-ticks (*Bidens spp*), threesquare bulrush (*Scirpus pungens*), and wild rice (*Zizania aquatica*) are characteristic species. There is a natural variability in the composition and distribution of the plant associations.

Associations:

Habitat Values for Associated Fauna: Foraging by seabirds and waterfowl.

Associated rare plants:

SUAEDA CALCEOLIFORMIS	AMERICAN SEA-BLITE	SC
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Associated rare animals:

NONE KNOWN

Examples with Public Access: North River system; Merrimack River;

Threats:

Management needs:

Inventory need rank:

Inventory comments:

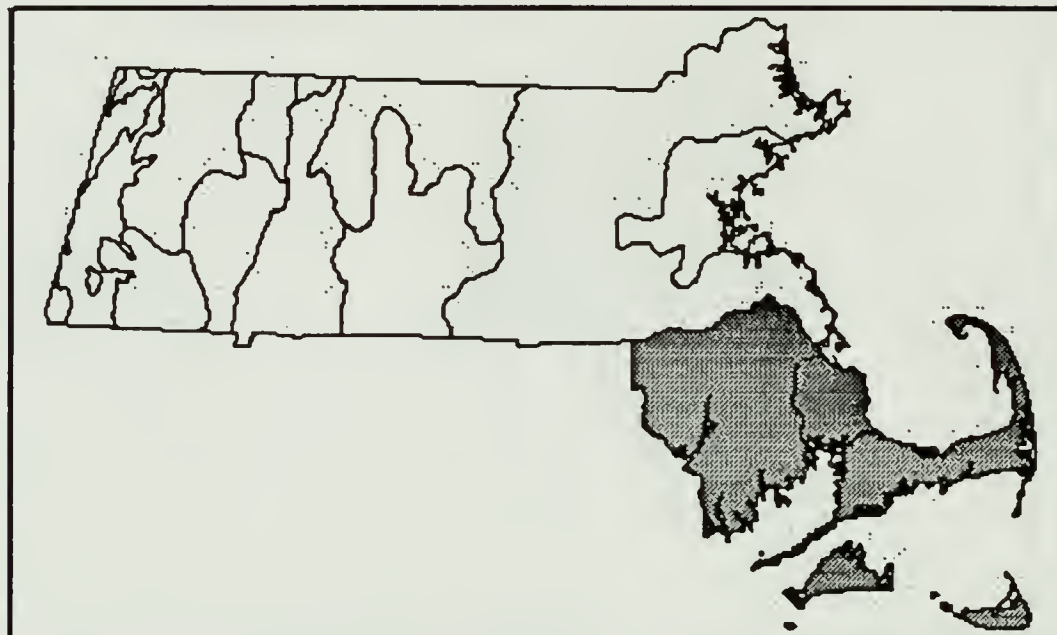
Synonyms:

USNVC/TNC:

MA (old name): Southern New England & Gulf of Maine Fresh/ Brackish Intertidal Flat Community.

ME: Marine: Intertidal mud flat community, Intertidal sand - gravel flat community.
NH:
NY: Estuarine intertidal: Freshwater intertidal mudflat.
CT:
RI:
Other:
Author: P. Swain **Date:** 6/13/99

Community Name: ESTUARINE INTERTIDAL: COASTAL SALT POND MARSH
 Community CODE: CE2B200000
 SRANK: S2
 Tracked: No



Concept: The vegetation surrounding coastal salt ponds. The inland ends tend to be fresher, with denser, taller vegetation developing. Similar to salt marsh.

Environmental setting: Inland ends and shores of saltponds. Sea-level fens [described in palustrine classification] are within the areas of Coastal salt pond marshes, but more restricted .

Vegetation Description: Beds of narrow-leaved cattail (*Typha angustifolia*), common reed (*Phragmites australis*), freshwater cord-grass (*Spartina pectinata*), coastal switchgrass (*Panicum virgatum* ssp. *spissum*), bulrushes (*Scirpus* spp., particularly *S. pungens*), and mock bishop's-weed (*Ptilimnium capillaceum*) grow at the inland ends of the salt ponds.

Associations:

**Habitat Values for
Associated Fauna:**

Associated rare plants:

CRASSULA AQUATICA	PYGMYWEED	T
HYDROCOTYLE VERTICILLATA	SALTPOND PENNYWORT	SC
SETARIA GENICULATA	BRISTLY FOXTAIL	SC
SUAEDA CALCEOLIFORMIS	AMERICAN SEA-BLITE	SC

Associated rare animals:

SPARTINIPHAGA INOPS	SPARTINA BORER	SC
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**Examples with
Public Access:**

Threats:

Management needs:

Inventory need rank:

Inventory comments: Inventory is needed to address the serious questions about the validity of this as a community separate from the more widespread tidal salt marshes.

Synonyms:

USNVC/TNC: Scirpus pungens Tidal Herbaceous Alliance -- Scirpus pungens - Eleocharis parvula Herbaceous Vegetation [CEGL006398].

MA (old name): Coastal Salt Pond Marsh.

ME: Marine - Salt pond community.

NH: Coastal salt pond marsh.

NY: Coastal salt pond.

CT: Possible, not described.

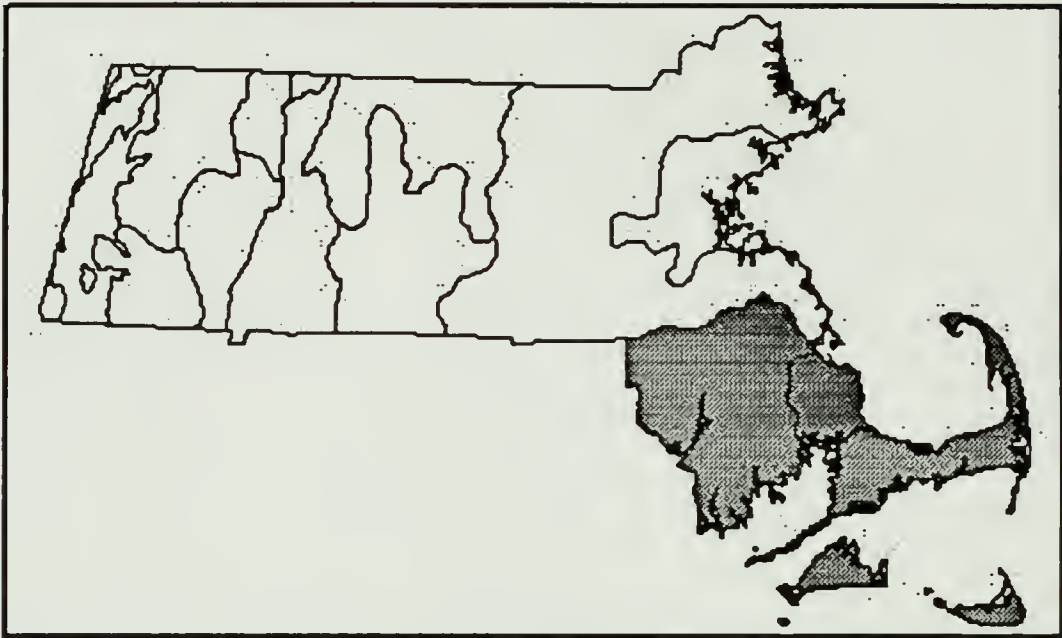
RI: Coastal salt pond.

Other:

Author: P. Swain

Date: 6/13/99

Community Name: (Palustrine) SEA-LEVEL FEN
Community CODE: CP2B0B3000
SRANK: S1
Tracked: Yes



Note: palustrine community associated with salt ponds.

Concept: Herbaceous/graminoid peatlands that occur at the upland edges of ocean tidal marshes. The combination of upland freshwater seepage and infrequent salt or brackish overwash produces a mixed plant community of freshwater and estuarine species.

Environmental setting: Sea-level fens occupy the interface between estuarine marshes and upland seepage slopes, and therefore have a distinct species assemblage including both estuarine and palustrine species. There are two hydrologic influences: acidic freshwater seepage from the uplands and periodic salt or brackish overwash from the adjacent marsh. Both are needed to produce the combination of species observed in sea-level fens.

Vegetation Description: Probable community type in Massachusetts, but vegetation descriptions are lacking. There are two probable occurrences reported from Martha's Vineyard that have saltmarsh spike-sedge (*Eleocharis rostellata*) co-occurring with acidic fen species. Plot data are needed. Ludwig (1995) described the flora of sea-level fens from Virginia, Delaware, New York, and Connecticut. He described three diagnostic species: saltmarsh straw-sedge (*Carex hormathodes*), saltmarsh spike-sedge (*Eleocharis rostellata*), and saltmarsh-threesquare (*Scirpus americanus*). Other common species include: New York aster (*Aster novi-belgii*), twig-sedge (*Cladium mariscoides*), spatulate-leaved sundew (*Drosera intermedia*), Canada rush (*Juncus canadensis*), pondshore-rush (*Juncus pelocarpus*), swamp-candles (*Lysimachia terrestris*), common reed (*Phragmites australis*), white beak-sedge (*Rhynchospora alba*), swamp-rose (*Rosa palustris*), common threesquare (*Scirpus pungens*), poison ivy (*Toxicodendron radicans*), and marsh St. John's-wort (*Triadenum virginicum*). [State Historical, deceitful spike-sedge (*Eleocharis fallax*) listed as common in more southern occurrences.]

Associations: No associations have been described in Massachusetts.

Habitat values: More information is needed.

Associated rare plants:

ELEOCHARIS FALLAX	DECEITFUL SPIKE-SEDGE	H
ELEOCHARIS ROSTELLATA	BEAKED SPIKE-SEDGE	- WL

Associated rare animals:

METARRANTHIS PILOSARIA

COASTAL SWAMP METARRANTHIS MOTH

SC

VERTIGO PERRYI

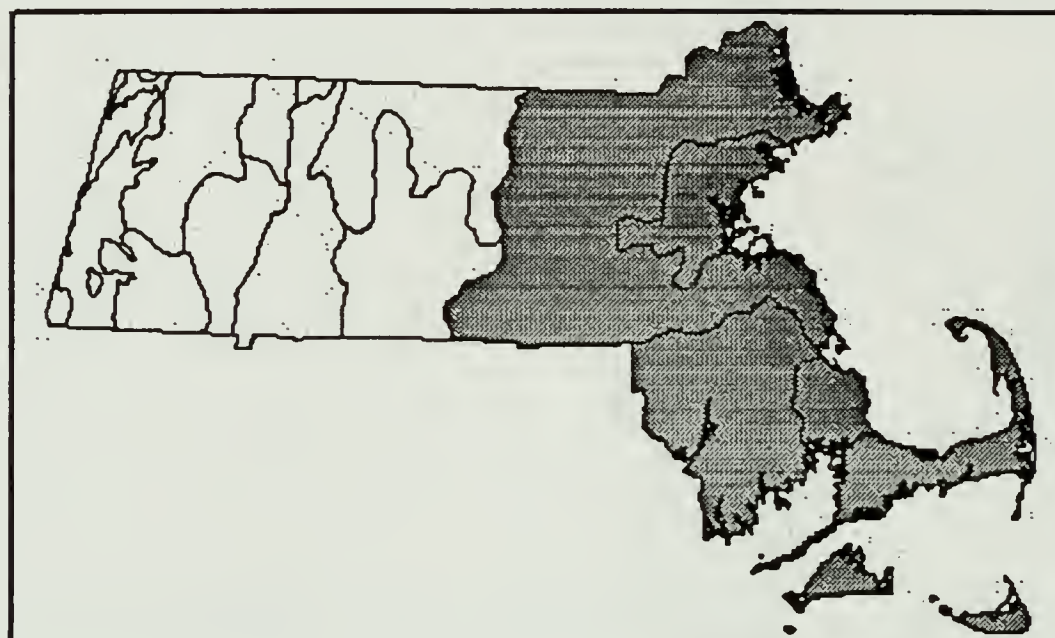
OLIVE VERTIGO

SC

Examples: on Martha's Vineyard**Threats:** Alteration to the natural hydrologic regime. Development in the uplands may have negative effects on upland seepage.**Management needs:** Maintain natural hydrology and upland buffer.**Inventory need rank:** 1**Inventory comments:****Synonyms:****USNVC/TNC:** Cladium mariscoides-Drosera intermedia-Eleocharis rostellata herbaceous vegetation [CEGL006310].**MA (old name):** Not described**ME:** Not described**VT:** Not described**NH:** Not described**NY:** Sea-level fen**CT:** Cladium mariscoides-Drosera intermedia-Eleocharis rostellata community?**RI:** Sea-level fen**Golet & Larson, 1974:****Other:****Author:** J. Kearsley**Date:** 7/21/99

modified 3/30/00, PCS

Community Name: ESTUARINE INTERTIDAL: SALT MARSH
 Community CODE: CE2B100000
 SRANK: S3
 Tracked: No



Concept: A graminoid dominated, tidally flooded coastal community with several zones.

Environmental setting: Salt marshes form in areas subject to oceanic tides, but are somewhat sheltered from wave energy. They usually occur in estuaries and behind barrier beaches and spits. A peat develops in the higher marshes, with marsh plants extending into flats in stabilized areas, raising the surface area and allowing the marsh to expand. Upper edges may be brackish.

Vegetation Description: Saltwater cord-grass (*Spartina alterniflora*) dominates the low marsh area, between the low and mean high tide. Between the mean high tide and the spring high tide, the high marsh area, salt-marsh hay (*Spartina patens*) dominates, usually mixed with spike grass (*Distichlis spicata*). Towards the upland edge, black grass (*Juncus gerardii*) becomes more common. Mixed throughout, especially towards the upper edges sea - lavender (*Limonium carolinianum*), seaside goldenrod (*Solidago sempervirens*), and salt tolerant species. At the freshest edges, salt marsh switch grass (*Panicum virgatum*) may be common. At those upper edges and on ditch spoils, groundsel-tree (*Baccharis halimifolia*) and saltmarsh elder (*Iva frutescens*) can form shrubby zones. Scattered in low, poorly drained, salty areas, salt pannes form, with populations of glasswort (*Salicornia* spp.) and saltwort (*Salsola kali*).

Associations: Low marsh, high marsh, salt shrub, and salt panne are often described as separate communities within the salt marsh system.

Habitat Values for Associated Fauna: Many species of birds forage in salt marshes. A few such as Seaside Sparrow (*Ammodramus maritimus*) and the Saltmarsh Sharp-tailed Sparrow (*A. caudacutus*) nest there as well. In fall and winter, Short-eared Owls (*Asio flammeus*), Snowy Owls (*Nyctea scandiaca*), and Northern Harrier (*Circus cyaneus*) hunt salt marshes. In summer, Snowy Egrets (*Egretta thula*) and Glossy Ibis (*Plegadis falcinellus*) forage in pools at low tide. Few mammals are resident in salt marshes, but Meadow voles (*Microtus pennsylvanica*) use them, retreating to dryer areas during high tides. Fiddler crabs are invertebrates that are identified with salt marsh creeks.

Associated rare plants:

Associated rare animals:

PANDION HALIAETUS	OSPREY	- WL
SPARTINIPHAGA INOPS	SPARTINA BORER	SC

Examples with Public Access: Parker River National Wildlife Refuge, Ipswich; Salisbury Marsh, Salisbury, Great Marshes, Barnstable; Nauset Marsh, Eastham; Great Sippewissett Marsh, Falmouth

Threats:

Management needs:

Inventory need rank:

Inventory comments:

Synonyms:

USNVC/TNC: Includes *Spartina alterniflora* Tidal Herbaceous Alliance – *Spartina alterniflora*/ (*Ascophyllum nodosum*) Acadian, Virginian Zone Herbaceous Vegetation [4192]; *Spartina patens* - (*Distichlis spicata*) Tidal Herbaceous Alliance – *Spartina patens* - *Distichlis spicata* - *Plantago maritima* Herbaceous Vegetation [CEGL006006] and *Spartina patens* - *Agrostis stolonifera* Herbaceous Vegetation [CEGL006365]; *Panicum virgatum* Tidal Herbaceous Alliance – *Panicum virgatum* tidal Herbaceous Vegetation [Provisional] [CEGL006150]; *Baccharis halimifolia* - *Iva frutescens* Tidal shrubland Alliance - *Baccharis halimifolia* - *Iva frutescens* / *Panicum virgatum* Shrubland [CEGL006063]; *Sarcocornia perennis* - (*Distichlis spicata*, *Salicornia* spp.) Tidal Herbaceous Alliance – *Sarcocornia perennis* - *Salicornia* spp. - *Spartina alterniflora* Herbaceous Vegetation [CEGL004308].

MA (old name): Salt Marsh [formerly Southern New England and Gulf of Maine Salt Marshes].

ME: Includes Cord-grass saltmarsh community; Salt hay saltmarsh community.

NH: Present

NY: Includes Low salt marsh; high salt marsh; salt shrub; Salt panne.

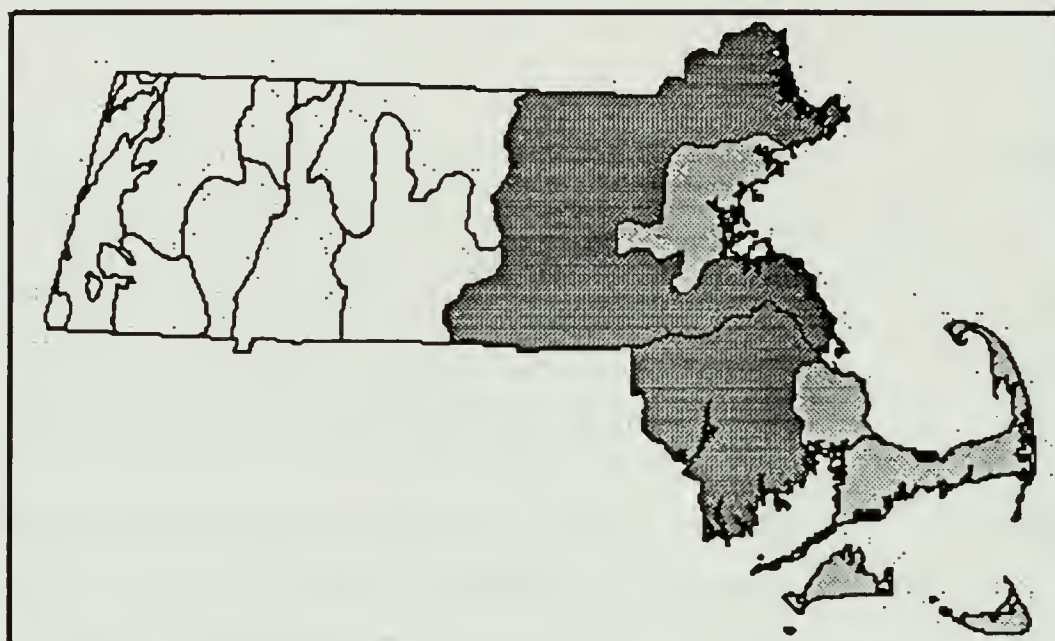
CT: Includes *Spartina alterniflora* community, *Spartina patens* - *Distichlis spicata* community. *Spartina patens* - *Agrostis stolonifera* community (brackish meadow); *Panicum virgatum* medium - tall grasslands; *Iva frutescens* / *Panicum virgatum* community; *Salicornia europea* - *Spartina alterniflora* community.

RI: Includes Low salt marsh; High salt marsh; Salt shrub; Salt panne.

Other:

Author: P. Swain **Date:** 6/15/99

Community Name: ESTUARINE INTERTIDAL: BRACKISH TIDAL MARSH
 Community CODE: CE2B300000
 SRANK: S1
 Tracked: Yes



- Concept:** Mixed herbaceous marsh that is flooded by daily tides, and occurs in brackish reach of coastal rivers. May also occur in smaller patches in upper zones of coastal salt marshes and salt ponds, usually near seepages or freshwater transition areas.
- Environmental setting:** Brackish tidal marshes occur along free-flowing coastal rivers. Smaller patches often occur along the edges of salt marsh habitat, near stream inputs, seepages or other freshwater transition areas. Tidal amplitude ranges from 0 to 150 cm [comparable to freshwater tidal marshes], while average annual salinity is [0.5] - 5-18 ppt. The community is often structurally diverse, including high marsh and low marsh, with occasional occurrences along rocky shores, seepages, and ditches. Brackish Tidal Marsh, mud flat zone is rich in organic sediments and, grades into adjacent less organic Brackish Mud Flats which are classified as Estuarine Intertidal: Saline/Brackish Flats.
- Vegetation Description:** Narrow-leaved cattail (*Typha angustifolia*) is typically dominant in the backmarsh, with frequent stands of common reed (*Phragmites australis*). Freshwater cord-grass (*Spartina pectinata*) and saltmarsh bulrush (*Scirpus robustus*) occur along the banks, associated with saltmarsh sedge (*Carex paleacea*) and marsh bentgrass (*Agrostis stolonifera*), which frequently sprawls over the edge. Low marsh supports stands of saltmarsh cord-grass (*Spartina alterniflora*) and threesquare (*Scirpus pungens*). Mudflats and shores support sparse low herbs such as water pimpernel (*Samolus valerandi* var. *parviflorus*), mud lily (*Lilaeopsis chinensis*) and creeping spearwort (*Ranunculus flammula* var. *ovalis*). Plants of freshwater tidal marshes occasionally occur in the higher zones of brackish marshes.
- Associations:** Massachusetts' brackish tidal marsh communities appear compatible with Connecticut's associations: (*Spartina alterniflora* - *Lilaeopsis chinensis* community, *Typha angustifolia* - *Hibiscus moscheutos* community, *Spartina patens* - *Agrostis stolonifera* community, *Scirpus pungens* - *Sagittaria* spp. tall grassland).
- Habitat Values for Associated Fauna:** This community provides outstanding general wildlife habitat, with abundant food sources for migratory and wintering waterfowl, and is generally associated with river reaches with spawning habitat for anadromous fisheries. Amphibian and reptile diversity is lower than in freshwater tidal communities.

Associated rare plants:

BIDENS EATONII	EATON'S BEGGAR-TICKS	T
CARDAMINE LONGII	LONG'S BITTER-CRESS	E

CRASSULA AQUATICA	PYGMYWEED	T
RANUNCULUS FLAMMULA VAR. OVALIS	CREEPING SPEARWORT	-WL
SAGITTARIA SUBULATA VAR SUBULATA	RIVER ARROWHEAD	E
SETARIA GENICULATA	BRISTLY FOXTAIL	SC
SPARTINA CYNOSUROIDES	SALT REEDGRASS	SC

Associated rare animals:

CINCINNATIA WINKLEYI	NEW ENGLAND SILTSNAIL	SC
LITTORIDINOPS TENUIPES	COASTAL MARSH SNAIL	SC

Examples with Public Access: Large examples are known from the North and South Rivers; also occurs on the Palmer, Westport, Paskamansett, Weweantic, Agawam, Mashpee, and Merrimack Rivers, and probably along several other rivers on the north shore. Occurrences along salt marshes are not well documented.

Threats: Invasive species appear to be the primary threat to this natural community. Brackish tidal marshes in several rivers are dominated by common reed (*Phragmites australis*), and purple loosestrife (*Lythrum salicaria*) appears to be more aggressive in brackish marshes than in freshwater tidal marshes.

Management needs: Monitor invasive plant populations, and determine feasibility of control measures.

Inventory need rank: 1

Inventory comments:

Synonyms:

USNVC/TNC: Includes Typha (angustifolia, domingensis) Tidal Herbaceous Alliance – Typha angustifolia - Hibiscus moscheutos Herbaceous Vegetation [CEGL004201]; Scirpus pungens Tidal Herbaceous Alliance – Scirpus pungens Herbaceous Vegetation [CEGL004188]; Spartina alterniflora Tidal Herbaceous Alliance – Spartina alterniflora- Lilaeopsis chinensis Herbaceous Vegetation [CEGL004193]; Spartina patens - (Distichlis spicata) Tidal Herbaceous Alliance – Spartina patens - Festuca rubra Herbaceous Vegetation [CEGL006368]; Panicum virgatum Tidal Herbaceous Alliance – Panicum virgatum Tidal Herbaceous Vegetation [Provisional] [CEGL006150]; Common reed (Phragmites australis) australis Tidal Herbaceous Alliance – Common reed (Phragmites australis) australis Tidal Herbaceous Vegetation [CEGL004187]; Spartina cynosuroides Tidal Herbaceous Alliance – Spartina cynosuroides Herbaceous Vegetation [CEGL004195].

MA (old name): Brackish Tidal Marsh [formerly Southern New England and Gulf of Maine].

ME: Similar to: Brackish Tidal Marsh community.

NH: Likely present, not described.

NY: Similar to: Brackish tidal marsh; Brackish Intertidal Mudflats; Brackish Intertidal shore.

CT: Includes Scirpus pungens - Sagittaria spp. Tall grassland; Spartina alterniflora - Lilaeopsis chinensis community; Spartina patens - Agrostis stolonifera community (also high salt marsh); and in part (with salt marsh) Panicum virgatum medium - tall grasslands; common reed (Phragmites australis) australis tall grasslands; Typha angustifolia - Hibiscus moscheutos community.

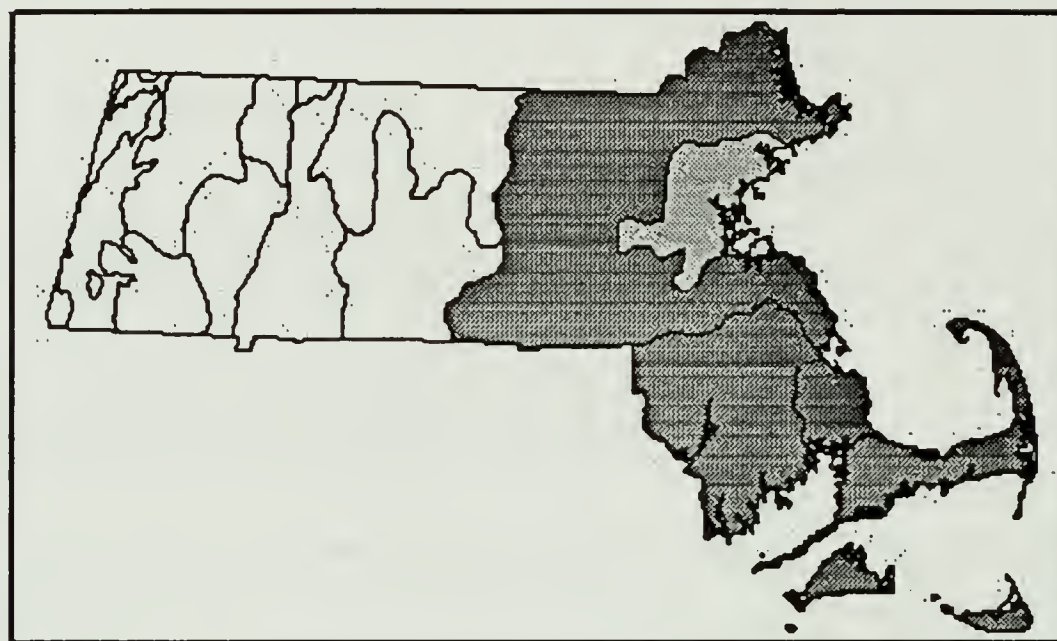
RI: Similar to: Brackish marsh.

Other:

Author: B. Reid

Date: 6/18/99

Community Name: ESTUARINE INTERTIDAL: FRESHWATER TIDAL MARSH
 Community CODE: CE2B400000
 SRANK: S1
 Tracked: Yes



- Concept:** Mixed herbaceous marsh flooded by daily tides, and occurring in the freshwater reach of coastal rivers.
- Environmental setting:** Freshwater tidal marshes occur along free-flowing coastal rivers. Tidal amplitude may range from 0 to 150 cm, and average annual salinity is less than 0.5 ppt. [from 0.5 ppt. to 5 pp. salinity, there is a gradient of species to the more clearly brackish, which has an average annual salinity of 5-18 ppt.]. This community occurs upstream of brackish tidal marsh, in the upper limits of tidal influence. The community may often be structurally diverse, including high marsh, low marsh, mud flats, rocky shore, ditches and seepages.
- Vegetation Description:** Dominant species include: blue joint (*Calamagrostis canadensis*), sedges (*Carex stricta*), narrow-leaved cattail (*Typha angustifolia*), wild rice (*Zizania aquatica*), smartweeds & tearthumbs (*Polygonum punctatum*, *P. arifolium*), jewelweed (*Impatiens capensis*), climbing hempweed (*Mikania scandens*) and sweet flag (*Acorus calamus*). Shrubs such as buttonbush (*Cephalanthus occidentalis*) and silky dogwood (*Cornus amomum*) may occasionally be present. Inundated False Pimpernel (*Lindernia dubia* var. *inundata*), which occurs in this community, is globally ranked by The Nature Conservancy but not listed in Massachusetts.
- Associations:** Caldwell & Crow (1992) describe eight cover types from a freshwater tidal area of the Merrimack River: (1) *Spartina alterniflora*; (2) *Sagittaria graminea*; (3) *Scirpus tabernaemontani*; (4) *Spartina pectinata*; (5) *Amaranthus cannabinus*; (6) *Scirpus pungens*; (7) *Acorus calamus*; (8) *Zizania aquatica*. That study area did not have a well developed high marsh area. Three of the TWINSPAN types were on rocky substrate, but within the freshwater tidal influence: (4) *Spartina pectinata*; (5) *Amaranthus cannabinus*; and (6) *Scirpus pungens*.
- Habitat Values for Associated Fauna:** This community provides outstanding general wildlife habitat, with abundant food sources for migratory and wintering waterfowl, and is generally associated with river reaches with spawning habitat for anadromous fisheries. It tends to have more vertebrate species than do the Brackish Tidal Marshes, such as freshwater snakes and muskrats.

Associated rare plants:

BIDENS HYPERBOREA VAR COLPOPHILA	ESTUARY BEGGAR-TICKS	E
CARDAMINE LONGII	LONG'S BITTER-CRESS	E
CONIOSELINUM CHINENSE	HEMLOCK PARSLEY	SC

CRASSULA AQUATICA	PYGMYWEED	T
ERIOCAULON PARKERI	ESTUARY PIPEWORT	E
SAGITTARIA SUBULATA VAR SUBULATA	RIVER ARROWHEAD	E
SCIRPUS FLUVIATILIS	RIVER BULRUSH	SC

Associated rare animals:

CINCINNATIA WINKLEYI	NEW ENGLAND SILTSNAIL	SC
LITTORIDINOPS TENUIPES	COASTAL MARSH SNAIL	SC

Examples with Public Access: Best examples are along the North River , and the Merrimack River. Smaller examples on the South, Palmer, Mashpee, Agawam and Parker Rivers.

Threats: Invasive plants purple loosestrife (*Lythrum salicaria*) and yellow flag (*Iris pseudacorus*) are established in some systems, although long-term threat is unknown. Alteration of river hydrology from excessive water withdrawal may have significant effect on plant communities. Development associated with recreational activity (*docks, landings*) may threaten rare plants in tidal shore habitat. In the past dams were often placed in rivers below the upper reaches of the tidal influence and so reduced the areas with tidal influence.

Management needs: Monitor invasive plant populations. Determine hydrologic requirements, and develop system for monitoring hydrologic stress. Prevent alteration of tidal shores.

Inventory need rank: 2 [Cape Cod]

Inventory comments:

Synonyms:

USNVC/TNC: Includes: Eriocaulon parkeri Tidal Herbaceous Alliance – Eriocaulon parkeri - Polygonum punctatum Herbaceous Vegetation [CEGL006352]; Nuphar lutea Tidal Herbaceous Alliance – Nuphar lutea ssp. advena Tidal Herbaceous Vegetation [CEGL004472]; Peltandra virginica - Pontederia cordata Tidal Herbaceous Alliance – Mixed Forbs (High Marsh) Tidal Herbaceous Vegetation [Provisional] [CEGL006325]; Zizania aquatica Tidal Herbaceous Alliance – Zizania aquatica Tidal Herbaceous Vegetation [CEGL004202]; Amaranthus cannabinus Tidal Herbaceous Alliance – Amaranthus cannabinus Herbaceous Vegetation [CEGL006080].

MA (old name): FW Tidal Marsh [formerly Southern New England FW Tidal]

ME: Freshwater Tidal Marsh

NH:

NY: Includes: part of Brackish intertidal mudflats; part of Freshwater Intertidal Mudflats; Freshwater tidal marsh; Freshwater intertidal shore; Freshwater Tidal Marsh; understory of Freshwater tidal swamp.

CT: Includes: Eriocaulon parkeri - Polygonum punctatum Community; Peltandra virginica - Cyperus strigosus; Pontederia cordata low forb vegetation; Eupatorium - Ludwigia palustris community; Hypericum mutilum - Gratiola aurea community; Zizania aquatica - Pontederia cordata community; Acorus calamus tall grasslands; Typha latifolia tall grasslands (semipermanently flooded); Peltandra virginica - Scirpus fluviatilis - Typha Community; Onoclea sensibilis - Scirpus fluviatilis - Typha spp. Community; Carex lacustris - Calamagrostis canadensis - Elymus canadensis community.

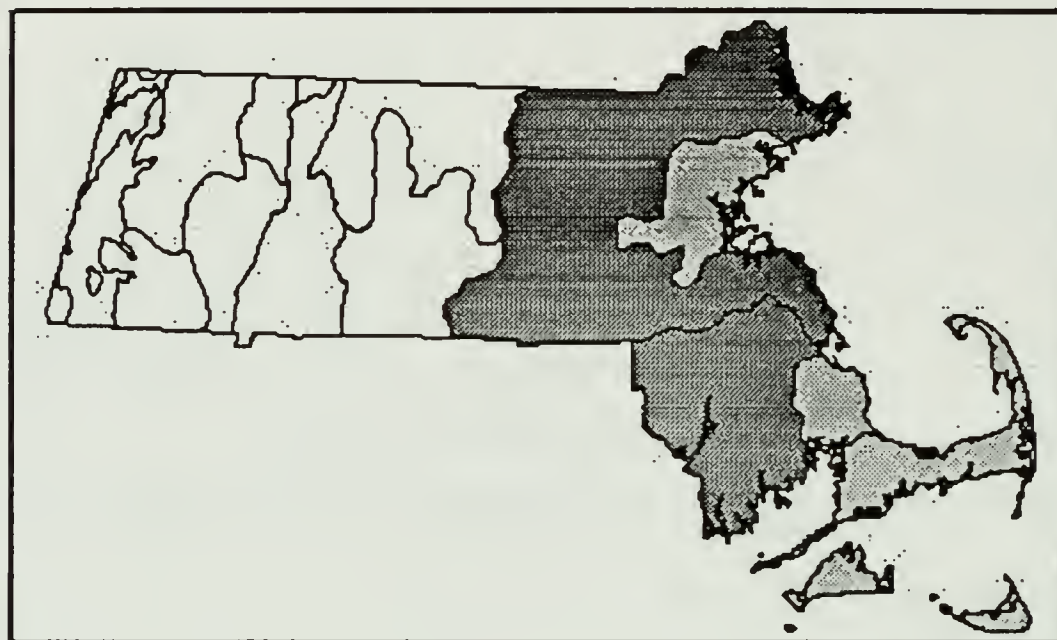
RI: Part of: Brackish intertidal mud flat [not in RI as such, no Eriocaulon parkeri]; Freshwater tidal marsh.

Other:

Author: B. Reid; P. Swain 1/25/2000

Date: 6/18/99

Community Name: ESTUARINE INTERTIDAL: FRESH/ BRACKISH TIDAL SHRUBLAND
 Community CODE: CE2C000000
 SRANK: S1
 Tracked: Yes



Concept: Dense to open shrubland flooded by daily tides, occurring along the freshwater to brackish reach of coastal rivers.

Environmental setting: Normally located as a transition between freshwater tidal marsh and freshwater tidal swamp, there may also be patches of tidal shrublands throughout the freshwater tidal marshes. There is a great deal of micro-relief [tussocks and hollows] leading to high species diversity. Flood waters are typically slightly acid [pH less than 5] and soils are usually mineral without significant peat deposits. Average annual salinity values of less than 0.5 ppt. would be expected in freshwater tidal shrublands, and (0.5) -5 -18 ppt. in brackish tidal swamps.

Vegetation Description: Tidal freshwater, or slightly brackish shrublands dominated by sweet gale (*Myrica gale*) and smooth alder (*Alnus serrulata*) with some speckled alder (*Alnus incana* ssp. *rugosa*). Some examples may have a mixed canopy with other shrubs such as silky dogwood (*Cornus amomum*), swamp-rose (*Rosa palustris*), winterberry (*Ilex verticillata*), common elderberry (*Sambucus canadensis*), willow (*Salix* spp.), buttonbush (*Cephalanthus occidentalis*), and poison ivy (*Toxicodendron radicans*). More northern examples may contain arrow-wood (*Viburnum dentatum* var. *lucidum*) and meadowsweet (*Spiraea alba* var. *latifolia*). Tussock-sedge (*Carex stricta*) may also be present. Some herbaceous associates are Royal fern (*Osmunda regalis* var. *spectabilis*), marsh-fern (*Thelypteris palustris* var. *pubescens*), bedstraws (*Galium* spp.), common cat-tail (*Typha latifolia*), arrow-arum (*Peltandra virginica*), New York aster (*Aster novi-belgii*), false nettle (*Boehmeria cylindrica*), touch-me-not (*Impatiens capensis*), and swamp milkweed (*Asclepias incarnata*).

Associations:

Habitat Values for Associated Fauna: Because the size and structure of the shrubland present are more important to most animals that would use a such a habitat, than are the slight fluctuations in water levels on a daily basis the species present are often those of maritime and coastal shrublands. Coastal shrublands are particularly important to migrating flocks of song birds.

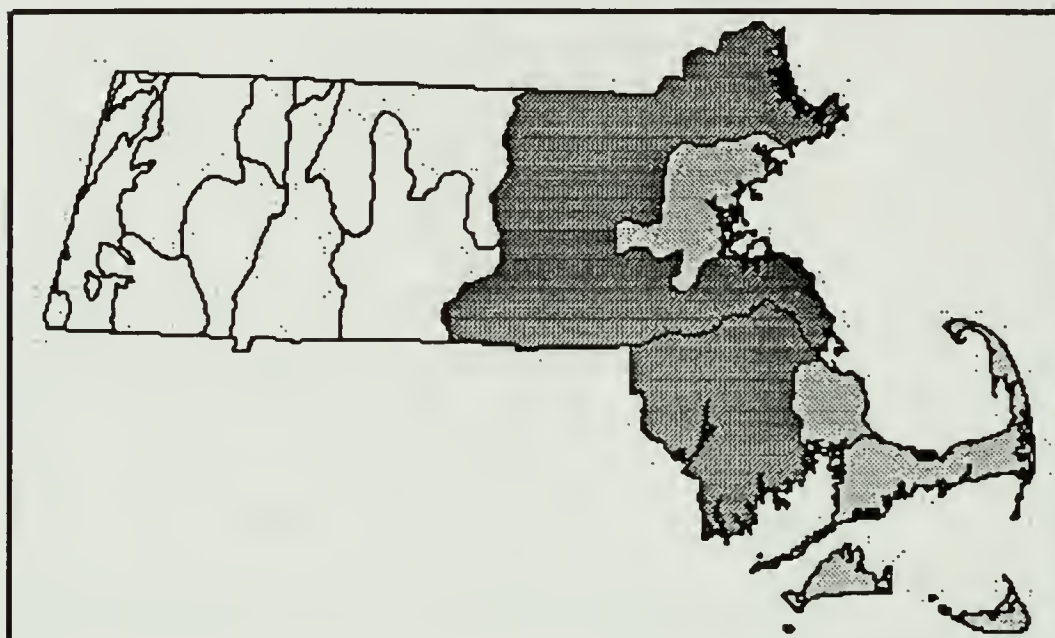
Associated rare plants:

Associated rare animals:

Examples with Public Access; North River, Pembroke; Probable along the following: Mashpee River, Mashpee; Red Brook, Mashpee; Sippican River, Marion.

Threats: Disruption of tidal influence on the rivers, clearing for boat landings.
Management needs:
Inventory need rank: 2
Inventory comments: Check probable occurrences.
Synonyms:
USNVC/TNC: *Alnus* (incana, serrulata) Tidal Shrubland Alliance – *Alnus* (incana ssp. rugosa, serrulata) - *Cornus amomum* Shrubland [CEGL006337].
MA (old name): Part of Southern New England / Gulf of Maine Fresh/ Brackish Tidal Swamp.
ME: Not described.
NH: Not described.
NY: Part of Freshwater Tidal Swamp.
CT: *Alnus rugosa* - *Cornus amomum* - *Iris verticillata* community.
RI: Not described.
Other:
Author: P. Swain **Date:** 6/20/99

Community Name: ESTUARINE INTERTIDAL: FRESH / BRACKISH TIDAL SWAMP
 Community CODE: CE1A000000
 SRANK: S1
 Tracked: Yes



Concept: Low stature forested wetland located along coastal rivers, at the upper limit of tidal influence, and flooded by daily tides. Dense shrub understory and unusually rich herbaceous layer.

Environmental setting: Tidal swamps occur along free-flowing coastal rivers, occurring upstream of freshwater tidal marsh, within the upper limits of tidal influence. The community represents an ecotone from tidal marsh to more typical non-tidal forested wetlands. Another variation of this community occurs along smaller streams at the upper limit of tidal influence. Tidal amplitude may range from 0 to 40 cm or more (estimated), and average annual salinity is less than 0.5 ppt. in freshwater areas, with gradients to 5 ppt. Brackish occurrences (average annual salinity (0.5) 5 - 18 ppt.) are also believed to occur, although more study is required. The best known occurrence of the community occurs along the edge of a freshwater tidal marsh, at the transition to a large Atlantic white cedar swamp.

Vegetation Description: Swamp white oak (*Quercus bicolor*) and red maple (*Acer rubrum*) occur on elevated hummocks, and form an open forest canopy. The shrub layer is often very dense, and typically includes arrowwood (*Viburnum dentatum* var. *lucidum*), winterberry holly (*Ilex verticillata*) and silky dogwood (*Cornus amomum*). Large mucky hollows flooded by daily tides support a diverse assemblage of herbs and graminoids. Most of these are typical of the nearby freshwater tidal marsh habitat, and include jewelweed (*Impatiens capensis*), sensitive fern (*Onoclea sensibilis*) and wild rice (*Zizania aquatica*). A similar association is dominated by more dense stands of Atlantic white cedar (*Chamaecyparis thyoides*).

Associations:

Habitat Values for Associated Fauna: The size of the swamp and structure produced by the forest and shrubs present are more important to most animals that would use a tidal swamp, than are the slight fluctuations in water levels on a daily basis.

Associated rare plants:

CARDAMINE LONGII	LONG'S BITTER-CRESS	E
CONIOSELINUM CHINENSE	HEMLOCK PARSLEY	SC
LYCOPUS RUBELLUS	GYPSYWORT	E

Associated rare animals:

NONE KNOWN

Examples with Public Access:	The North River.		
Threats:	Alteration of river hydrology from excessive water withdrawal may have significant effect on plant communities.		
Management needs:	Determine hydrologic requirements, and develop system for monitoring hydrologic stress.		
Inventory need rank:	2		
Inventory comments:	Investigate occurrences along small streams and in brackish wetlands.		
Synonyms:			
USNVC/TNC:	Acer rubrum - Fraxinus pennsylvanica Tidal Woodland Alliance – Acer rubrum - Fraxinus pennsylvanica / Polygonum spp. Woodland [CEGL006165].		
MA (old name):	Southern New England /Gulf of Maine Fresh/ Brackish Tidal Swamp.		
ME:	Present, not described.		
NH:	Possible, not described.		
NY:	Freshwater Tidal Swamp.		
CT:	Possible, not described.		
RI:	Possible, not described		
Other:			
Author:	Brian Reid	Date:	6/18/99

References

- Aizen, M.A. & W.A. Patterson III. 1995. Leaf phenology and herbivory along a temperature gradient: a spatial test of the phenological window hypothesis. *J Veg. Sci.* 6:543-550.
- Backman, A.E. 1984. 1000-year record of fire-vegetation interactions in the northeastern United States: a comparison between coastal and inland regions. MS Thesis. University of Massachusetts, Amherst.
- Baptista, T.L. & S.W. Shumway. 1998. A comparison of the seed banks of sand dunes with different disturbance histories on Cape Cod National Seashore. *Rhodora* 100:298-313.
- Batcher, Michael S. 2000. Final report on survey of Three Mile Pond Wildlife Management Area. Report to: Mass. Dept. Fisheries, Wildlife & Environmental Law Enforcement. BDI & NHESP.
- Bechtel, D.A. and D.D. Sperduto. 1998. Floodplain forest natural communities along major rivers in New Hampshire. Unpublished report to the U.S. Environmental Protection Agency. New Hampshire Natural Heritage Inventory, Concord, NH.
- Bellis, Vincent J. 1995. Ecology of maritime forests of the southern Atlantic Coast: a community profile. USDI, National Biological Service. Biol. Rpt 30. 95pp.
- Bertin, Robert in conjunction with Brian Butler. 1998. Floristic and herpetological inventories of Quaboag Wildlife Management Area and Wolf Swamp Wildlife Management Area. Report to BDI & MNHESP.
- Bertin, Robert. 1999. Floristic inventory of Bolton Flats Wildlife Management Area. Report to BDI & MNHESP.
- Blodget, Bradford G. 1998. Checklist of the birds of Massachusetts. Massachusetts Division of Fisheries & Wildlife. Westborough, MA 25pp.
- Braker, N.C. 1986. Draft. Stewardship plan for Katama Plains Conservation Area. The Nature Conservancy. Dec. 1986. and Peter Dunwiddie burn plan and comments from Mark Heillinger.
- Brooks, Robert Richard. 1987. Serpentine and its vegetation: a multidisciplinary approach. Dioscorides Press, Portland, OR. 454pp.
- Buttrick, S. 1994. Interagency memo re. ranking pine barrens types. The Nature Conservancy. Eastern Regional Office. Boston, MA.
- Caldwell, F.A. & G.E. Crow. 1992. A floristic and vegetation analysis of a freshwater tidal marsh on the Merrimack River, West Newbury, Massachusetts. *Rhodora* 94:63-97.
- Caldwell, F.A. 1990. A floristic and vegetation analysis of a freshwater tidal marsh on the Merrimack River, West Newbury, Massachusetts. MS Thesis, University of New Hampshire. 98 pp.
- Cardoza, J.E. & P.G. Mirick. 1999. List of the reptiles and amphibians of Massachusetts. 3rd Ed. Massachusetts Division of Fisheries & Wildlife, Fauna of Massachusetts Series: No. 3. Westborough, MA.
- Cardoza, J.E., G.S. Jones, & T.W. French. 1999. MassWildlife's State Mammal List, 4th ed. Published electronically at: <http://www.state.ma.us/dfwele/dfw/dfwmam.htm> 15 pp.
- Center for Natural Areas, Office of International and Environmental Programs, Smithsonian Institution. 1974. Survey of Natural Areas of the Atlantic Coastal Plain Vol. 5., National Natural Landmark theme study for National Park Service, US Dept. of the Interior.
- Clark, F.H., J. MacDougall, F. Goodwin, C. Mom, R. Hopping, B. Speare, and L. Vernegaard. 1998. Biological survey of Crane Pond Wildlife Management Area, Essex County, Massachusetts. Unpublished report to the Massachusetts Department of Fisheries, Wildlife, and Environmental Law Enforcement, Biodiversity Initiative, Ecological Restoration Program. Westborough, MA.
- Clark, Frances & David Lovejoy. 1996. East Brimfield Lake, Endangered plant species and natural communities survey. Part of Report to Army Corps of Engineers, New England Division, from MA Natural Heritage & Endangered Species Program.
- Coastal Zone Management. 1977. MA Coastal Zone Management Program. Vol. 1/ 2. MA Executive Office of Environmental Affairs.
- Conkling, Philip W. 1978. Old growth white pine (*Pinus strobus* L.) stands in Maine and their relevance to the Critical Areas Program. Planning Report No. 61, Critical Areas Program, Maine State Planning Office.

- Cowardin, L.M., V. Carter, F.C. Golet, and E.T. LaRoe. 1979. Classification of wetlands and deepwater habitats of the United States. U.S. Dept. of the Interior – Fish & Wildlife Service. Washington, D.C.
- Cramer, T.K. 1999. A floristic inventory of the salt marshes, islands, and tidal communities of Salisbury, Mass. Report to Massachusetts Natural Heritage & Endangered Species Program, Division of fisheries and Wildlife, Westborough, MA.
- Crum, H. 1992. A focus on peatlands and peat mosses. The University of Michigan Press. Ann Arbor, MI.
- Damman, A.W.H. & B. Kershner. 1977. Floristic composition and topographical distribution of the forest communities of the gneiss areas of Western Connecticut. *Le Naturaliste Canadien* 104:23-45.
- Damman, A.W.H. and T.W. French. 1987. The ecology of peat bogs of the glaciated northeastern United States: a community profile. Biol. Report 85 (7.16). U.S. Fish and Wildlife Service, Washington, D.C.
- DeGraaf, R.M. & D.D. Rudis. 1981. Forest habitat for reptiles & amphibians of the northeast. Northeastern forest experiment Station and Eastern Region, Forest Service, US Dept. Agriculture, Amherst, MA. 239pp.
- DeGraaf, R.M. & D.D. Rudis. 1983. Amphibians and reptiles of New England: habitats and natural history. The University of Massachusetts Press, Amherst. 83pp.
- Dehler-Seter, E. 1996. Cover type inventory and preliminary investigation of ecologically significant areas on land of the Mount Grace Land Conservation Trust, Massachusetts. M.S. Paper, Antioch University, Keene, NH.
- Dept. of Natural Resources. 1974. Massachusetts landscape and natural areas survey.
- DiGregorio, M. & P. Polloni. 1995. A floristics survey of Cape Cod Canal for rare and protected species and uncommon or exemplary plant communities. Report to NHESP & USACOE.
- Dunwiddie, P.W.. 1997. Long-term effects of sheep grazing on coastal sandplain vegetation. *Nat. Areas J.* 17:261-264.
- Dunwiddie, P.W. and R.T. Leverett. 1996. Survey of old-growth forest in Massachusetts. *Rhodora* 98:419-444.
- Dunwiddie, P.W., R.E. Zaremba, & K.A. Harper. 1996. A classification of coastal heathlands and sandplain grasslands in Massachusetts. *Rhodora* 98:117-145.
- Egler, Frank E. 1940. Berkshire Plateau vegetation, Massachusetts. *Ecol Monogr* 10(2):145-192.
- Elliman, Edward. 1999. Biological survey of Jug End WMA (1998). Report to BDI & MNHESP.
- Enser, R. 1995. Natural communities of Rhode Island. Rhode Island Natural Heritage Program, Providence, RI.
- Eyre, F.H., Editor. Forest cover types of the United States and Canada. Society of American Foresters, Washington, D.C. 148pp.
- Favour, P.G. 1974. Natural National Landmark brief on Hawley Bog.
- Findlay, S. K. Howe, & H.K. Austin. 1990. Comparison of detritus dynamics in two tidal freshwater wetlands. *Ecology* 71:288-295.
- Finton, A.D. 1998. Succession and plant community development in pitch pine – scrub oak barrens of the glaciated northeast United States. MS Thesis, University of Massachusetts, Amherst.
- Flaccus, E. 1972. Vegetation of natural areas of the hemlock-white pine-northern hardwood region of the eastern deciduous forest. (thesis) prepared for the U.S. Department of the Interior, NPS.
- Foster, D.R., G. Motzkin, and B. Slater. 1998. Land-use history as long-term broad-scale disturbance: regional forest dynamics in Central New England. *Ecosystems* 1:96-119.
- Foster, D.R. & G. Motzkin. 1999. Historical influences on the landscape of Martha's Vineyard: perspectives on the management of the Manuel F. Correllus State Forest. Harvard Forest Paper No. 23. Harvard University, Petersham, MA.
- Geist, M.A. 1996. Waquoit Bay National Estuarine Research Reserve. National Oceanic & Atmospheric Administration and Mass. Dept of Environmental Management.
- Godfrey, P.J. & K.B. Searcy. 1996. Continuation of a 1994 study of the status of balds & primary succession on the Holyoke Range, Connecticut River Valley, MA. Report to NHESP.
- Godfrey, P.J. 1976. Barrier beaches of the east coast. *Oceanus* 19:27-40.

- Godfrey, P.J. 1976. Barrier islands and beaches. In Tech. Proc. 1976 Barrier Islands Workshop. The Conservation Foundation.
- Godfrey, P.J., M.M. Godfrey, & D. Disraeli. 1982. North America, coastal ecology. P. 580-593 In Schwartz, M.L. ed. The Encyclopedia of beaches and coastal environments. Hutchinson Ross Publishing Co. Stroudsburg, PA.
- Goldstein, P.Z. 1997. Lepidopteran assemblages and the management of sandplain communities on Martha's Vineyard, Massachusetts. In Vickery, P & P. Dunwiddie, eds. Grasslands of eastern North America. Massachusetts Audubon Society.
- Golet, F.C. and J.S. Larson. 1974. Classification of freshwater wetlands in the glaciated Northeast. US Fish and Wildlife Service Resource Publication 116, Washington D.C.
- Golet, F.C., A.J.K. Calhoun, W.R. DeRagon, D.J. Lowry, and A.J. Gold. 1993. Ecology of red maple swamps in the glaciated Northeast: A community profile. Biological Report 12. U.S. Department of the Interior, Fish and Wildlife Service, Washington, D.C.
- Goodwin, R. and W. Niering. 1975. Inland wetlands of the U.S. U.S. Dept. of the Interior, National Park Service. Natural History theme series no. 2, Washington, D.C.
- Griffith, G.E., J.M. Omernik, S.M. Pierson, and C.W. Kiilsgaard. 1994. The Massachusetts ecological regions project. United States Environmental Protection Agency, Publication No. 17587-74-6/94-DEP, Washington, D.C.
- Hammer, S. 1994. A preliminary report on the lichens of Myles Standish State Forest with a focus on the potential impact of non-designated off-road vehicle trails on the lichen flora at sensitive sites. Report to the MNHESP.
- Hickler, M.G., K.B. Searcy, J. Bellemare, M. Winhold, L. Higgins, and D. Small. 1999. Satan's Kingdom Wildlife Management Area Natural Resource Inventory. Unpublished report to the Massachusetts Department of Fisheries, Wildlife, and Environmental Law Enforcement, Biodiversity Initiative, Ecological Restoration Program, Westborough, MA.
- Holland, M.M. and C.J. Burk. 1984. The herb strata of three Connecticut River oxbow swamp forests. *Rhodora* 86: 397-413.
- Jenkins, Jerry and Elizabeth Thompson. 1992. The vegetation of Minuteman National Park: Concord, Lincoln, and Lexington, Massachusetts. Report to NHESP and NPS.
- Jones, A.L. & P.D. Vickery. No date. Conserving grassland birds: managing large grasslands, including conservation lands, airports, and landfills over 75 acres for grassland birds. Mass. Audubon Society.
- Jones, A.L. & P.D. Vickery. No date. Conserving grassland birds: managing small grasslands including conservation lands, corporate headquarters, recreation fields, and small landfills for grassland birds. Massachusetts Audubon Society. Lincoln, MA.
- Jorgensen, Neil. 1978. A Sierra Club Naturalist's guide to Southern New England. Sierra Club Books, San Francisco. 417pp.
- Judd, W.S. 1980. Bryophytes of the peat mat at Ponkapoag Pond, eastern Massachusetts, with taxonomic and ecological notes on *Sphagnum*. *Rhodora*. 82:563-578.
- Kearsley, J.B. 1998. Inventory and vegetation classification of floodplain forest communities in Massachusetts. Unpublished report to the U.S. Environmental Protection Agency. Massachusetts Natural Heritage and Endangered Species Program, Westborough, MA.
- Kearsley, J.B. 1999a. Inventory and vegetation classification of floodplain forest communities in Massachusetts. *Rhodora* 906:105-135.
- Kearsley, J.B. 1999b. Rare and non-native plants of Massachusetts' floodplain forests. *Rhodora*: 200-205.
- Kearsley, J.B. 1999c. Inventory and vegetation classification of non-forested acidic peatlands in Massachusetts. Unpublished report to the U.S. Environmental Protection Agency. Massachusetts Natural Heritage and Endangered Species Program, Westborough, MA.
- Keever, Catherine. 1971. Study of the mixed mesophytic, western mesophytic, & oak chestnut regions of the eastern deciduous forest including a rev. of vegetation and sites recommended as potential Natural Landmarks, for National Park Service, U.S. Dept. of the Interior.

- Klemens, Michael W. 1993. Amphibians and reptiles of Connecticut and adjacent regions. State Geological and Natural History Survey of Connecticut Bulletin 112. Connecticut Dept. Environmental Protection, Hartford, CT. 318pp.
- Kuriger, W.E. and P. Rezendes. 1991. The botany, habitats, and wildlife of the 1000 Acre Swamp, Athol and Phillipston, Massachusetts. Unpublished report.
- Lee, C. 1985. West Rock to the Barndoor Hills. The Traprock Ridges of Connecticut. State Geological and Natural History Survey of Connecticut. DeLee, C. 1985. West Rock to the Barndoor Hills. Traprock Ridges. Geology & Natural History Survey of Connecticut. Vegetation of Connecticut Natural Areas #4.
- Livingston, R. B. and B. E. Lund. (unpublished manuscript ca. 1975). Microclimates and Vegetation of the Holyoke Range, Massachusetts.
- Lortie, J.P., B.A. Sorrie and D.W. Holt. 1991. Flora of the Monomoy Island, Chatham, Massachusetts. *Rhodora*. 93: 361-389.
- Lundgren, J.A. 1989. Distribution and phenology of pondshore vegetation at a coastal plain pond in Plymouth, MA. M.S. Thesis. Botany Department. University of Massachusetts, Amherst, MA.
- Lundgren, J.A. 1997. Natural communities of coastal Massachusetts: inventory and assessment 1997-1998. Report to the Massachusetts Natural Heritage and Endangered Species Program. Westborough, MA.
- Lundgren, Julie A. ed. 2000. Plant communities of the Lower New England - Northern Piedmont Ecoregion. The Nature Conservancy / Association for Biodiversity. Boston, MA.
- Maine Natural Heritage Program. 1991. Natural Landscapes of Maine: A Classification of Ecosystems and Natural Communities. Department of Economic and Community Development, State House Station 130, Augusta, ME. 77pp.
- Massachusetts Coastal Zone Management. 1994. Guidelines for Barrier Beach Management in Massachusetts. A report of the Massachusetts Barrier Beach Task force. Massachusetts Executive Office of Environmental Affairs, Boston, MA.
- Massachusetts Natural Heritage and Endangered Species Program. 1995. Cape Cod Canal Rare and protected species and uncommon or exemplary natural communities survey. Unpublished report to the Department of Army, New England Division Corps of Engineers. Massachusetts Natural Heritage and Endangered Species Program, Westborough, MA.
- Massachusetts Natural Heritage and Endangered Species Program. 1995. Inventory of Westover ARB for rare and protected species and uncommon or exemplary plant communities 1994-1995. Unpublished report to the Department of Army, New England Division Corps of Engineers. Massachusetts Natural Heritage and Endangered Species Program, Westborough, MA.
- Massachusetts Natural Heritage and Endangered Species Program. 1996. Conant Brook Dam Property rare or protected species and exemplary natural communities survey. Unpublished report to the US Air Force. Massachusetts Natural Heritage and Endangered Species Program, Westborough, MA.
- Massachusetts Natural Heritage and Endangered Species Program. 1996. East Brimfield Lake Property rare or protected species and exemplary natural communities survey. Unpublished report to the Department of Army, New England Division Corps of Engineers. Massachusetts Natural Heritage and Endangered Species Program, Westborough, MA.
- Massachusetts Natural Heritage and Endangered Species Program. 1998. Ecological assessment of the Shawsheen and Spicket River Corridors in the Lawrence USGS Topographic Quad. Report prepared for the National Park Service, Boston, MA. Massachusetts Natural Heritage and Endangered Species Program, Westborough, MA.
- Massachusetts Natural Heritage and Endangered Species Program. 1998. Knightville Dam Property rare or protected species and priority natural communities survey. Report to the Department of Army, New England Division Corps of Engineers. Massachusetts Natural Heritage and Endangered Species Program, Westborough, MA.

- Massachusetts Natural Heritage and Endangered Species Program. 1998. West Hill Dam Property rare or protected species and priority natural communities survey. Report to the Department of Army, New England Division Corps of Engineers. Massachusetts Natural Heritage and Endangered Species Program, Westborough, MA.
- Massachusetts Natural Heritage and Endangered Species Program. 1998. Westville Lake Property rare or protected species and priority natural communities survey. Report to the Department of Army, New England Division Corps of Engineers. Massachusetts Natural Heritage and Endangered Species Program, Westborough, MA.
- Mawson, J.C., W. Rivers, & B. Fischer. 1985. A forest land classification system for Massachusetts. Cooperative Extension Service C-175. University of Massachusetts, Amherst, MA.
- Metzler, K.J. & J.P. Barrett. 1996. Vegetation classification for Connecticut, Organized into the modified UNESCO hierarchy. Draft report, Connecticut Natural Diversity Database. Hartford, CT.
- Motzkin, G. 1990a. Age structure and successional status of the Marconi Atlantic white cedar swamp, Cape Cod National Seashore, South Wellfleet, MA. M.S. thesis. University of Massachusetts, Amherst, MA.
- Motzkin, G. 1990b. Atlantic white cedar wetlands of Massachusetts. Unpublished report submitted to the Massachusetts Natural Heritage and Endangered Species Program, Westborough, MA.
- Motzkin, G. 1991. Atlantic white cedar wetlands of Massachusetts. Research Bulletin 731. Massachusetts Agricultural Experiment Station, University of Massachusetts, Amherst, MA.
- Motzkin, G. 1993. Uncommon plant communities of the Connecticut Valley, Massachusetts. Unpublished report to the Massachusetts Natural Heritage and Endangered Species Program, Westborough, MA.
- Motzkin, G. 1994. Calcareous fens of western New England and adjacent New York state. *Rhodora* 96: 44-68.
- Motzkin, G. 1995. Inventory of uncommon plant communities of western Massachusetts: 1993-1994. Unpublished report to the Massachusetts Natural Heritage and Endangered Species Program, Westborough, MA.
- Motzkin, G., D.R. Foster, A. Allen, J. Harrod, & R. Boone. 1996. Controlling site to evaluate history: vegetation patterns of a New England sand plain. *Ecol. Monogr.* 66:345-365.
- Motzkin, G., W.A. Patterson III, and D.R. Foster, 1999. A historical perspective on Pitch Pine-Scrub Oak communities in the Connecticut Valley of Massachusetts. *Ecosystems* 2:255-273.
- Motzkin, G., W.A. Patterson III, and N.E.R. Drake. 1993. Fire history and vegetation dynamics of a *Chamaecyparis thyoides* wetland on Cape Cod, Massachusetts. *Journal of Ecology* 81: 391-402.
- Natural Heritage Program. 1982. Ecological significance of the Katama Plains, Edgartown, Martha's Vineyard. Massachusetts Natural Heritage Program, Boston, MA.
- Nichols, G. E. 1914. The vegetation of Connecticut. III Plant societies on uplands. *Torreya* 14: 167-194.
- Niering, W. A. & R.S. Warren. 1980. Vegetation patterns and processes in New England salt marshes. *BioScience* 30:301-307.
- Nixon, S.W. 1982. The ecology of New England high salt marshes: a community profile. USFWS, OBS, Washington, DC. FWS / OBS-81/55. 70 pp.
- Nothnagle, P., P. Goldstein and T. Simmons. 1994. *Cicindela dorsalis* population and habitat conditions on Martha's Vineyard 1990-1993. 1993 final report submitted to the Massachusetts Natural Heritage & Endangered Species Program. Feb. 2, 1994.
- Odum, W.E., T.J. Smith III, J.K. Hoover, & C.C. McIvor. 1984. The ecology of tidal freshwater marshes of the United States east coast: a community profile. USFWS. FWS/OBS - 83/17. 177pp.
- Ogden, J. Gordon III. 1961. Forest history of Martha's Vineyard, Massachusetts 1. Modern and pre-colonial forests. *Amer. Midl. Natur.* 66:417-430.
- Oliver, C.D. and E. P. Stephens. 1977. Reconstruction of a mixed-species forest in Central New England. *Ecology* 58:562-572.
- Oltsch, F.M. 1974. The bogs of Berkshire County, Massachusetts: a habitat evaluation and vegetation analysis with emphasis on value for preservation. M.S. Special Problem Report. University of Massachusetts, Amherst, MA.

- Rawinski, T.J. 1984a. New England natural community classification. Unpublished report, The Nature Conservancy, Eastern Regional Office, Boston, MA.
- Rawinski, T.J. 1984b. Natural community description abstract-Southern New England calcareous seepage swamp. Unpublished report, The Nature Conservancy, Eastern Regional Office, Boston, MA.
- Rawinski, T.J. 1988. Atlantic white cedar wetlands in central Massachusetts: locations and preliminary observations. Unpublished report, The Nature Conservancy, Eastern Regional Office, Boston, MA.
- Rawinski, Thomas J. 2000. Fire-maintained oak woodlands in the area of Worcester, MA: Vegetation ecology, wildlife, and conservation. Report to: Mass. Dept. Fisheries, Wildlife & Environmental Law Enforcement. BDI & NHESP.
- Reed, C.B. 1986. Floras of the serpentine formations in eastern North America. Baltimore. 858pp.
- Reid, B and M. Anderson-Hill. 1999. 1998 Natural resource inventory of the Noquochoke wetlands. Unpublished report to the Massachusetts Department of Fisheries, Wildlife, and Environmental Law Enforcement, Biodiversity Initiative, Ecological Restoration Program. Westborough, MA.
- Reschke, C. 1990. Ecological Communities of New York State. New York Natural Heritage Program, N.Y.S. department of Environmental Conservation. Latham, NY. 96 pp.
- Roberts, E. A. 1914. The plant succession of the Holyoke Range. Botanical Gazette 58: 432-444.
- Searcy, K., H. Lanza, and A. Park. 1993. Inventory and characterization of natural communities with tupelo-swamp white oak-pin oak association in the Connecticut River Valley, Hampshire and Franklin Counties, Massachusetts. Unpublished report to the Massachusetts Natural Heritage and Endangered Species Program, Westborough, MA.
- Searcy, K.B. and M.G. Hickler. 1999. The plant communities and vascular flora of the peatland within Poutwater Pond Nature Preserve. Rhodora 101:341-359.
- Searcy, K.B., B. Lindwall and T. Enz. 1993. Critical habitats and floristic survey of Fort Devens, Massachusetts.
- Searcy, K.B., Heather Lanza, and Allison Park. 1993. Inventory and characterization of natural communities with a tupelo-swamp white oak-pin oak association in the Connecticut River Valley. Hampshire & Franklin Counties, Ma. Report to NHESP.
- Shaw, Sally & Lowenstein. 1999. Classification of western Massachusetts pitch pine - scrub oak ridgetops and natural community inventory of Mount Tekoa in Russell, Massachusetts. Final report to the USFWS, Conte grant. The Nature Conservancy, Boston, MA.
- Shaw, Sally. 1998. Final report in fulfillment of challenge cost share grant for Stacy Mountain plant community mapping and trail building project (Req. no. CNWR-7-0020). The Nature Conservancy, prepared for Silvio O. Conte National FWR.
- Shifflet, C. 1981. Potential National Natural Landmarks. Geologic Themes.
- Slezak, W. 1975. An ecological analysis of the White Cedar Swamp Conservation Area, Wilbraham, Massachusetts. Unpublished report to the Wilbraham Conservation Commission Environmental Internship Program, Wilbraham, MA.
- Sneddon, L., M. Anderson, and J. Lundgren, eds. 1998. International classification of ecological communities: terrestrial vegetation of the Northeastern United States (July 1998 working draft). Unpublished report. The Nature Conservancy, Eastern Conservation Science and Natural Heritage Programs of the northeastern U.S., Boston, MA.
- Somers, P. T. Elliman, C. Quinlan, B. Windmiller, K. Sadighi, & F. Lowenstein. 2000. Biological and ecological features of the Appalachian Trail Corridor in Massachusetts. Final Report to the Appalachian Trail Conference and National Park Service from the Massachusetts Natural Heritage & Endangered Species Program, Division of Fisheries and Wildlife, Westborough, MA.
- Sorenson, E., M. Lapin, B. Engstrom, and R. Popp. 1998. Floodplain forests of Vermont: some sites of ecological significance. Unpublished report to the U.S. Environmental Protection Agency, Vermont Nongame and Natural Heritage Program, Waterbury, VT.
- Sorrie, B.A. & P. Somers. 1999. The vascular plants of Massachusetts: a county checklist. Massachusetts Division of Fisheries & Wildlife, Natural Heritage & Endangered Species Program, Westborough, MA 187 pp.

- Sperduto, D.D. 1994. A Classification of the Natural Communities of New Hampshire. New Hampshire Natural Heritage Inventory, Department of Resources and Economic Development. Concord, NH.
- Sperduto, D.D. 1997. The natural communities of New Hampshire: a guide and classification. Draft document 11-21-97, update 6-98. New Hampshire Natural Heritage Program. Concord, NH.
- Svenson, H.K.. 1970. A linden (*Tilia*) forest on Cape Cod (with extended notes on *Tilia neglecta*, *Bromus pubescens*, and *Ribes hirtellum*). *Rhodora* 72:339-350.
- Teal, J.M. 1986. The ecology of regularly flooded salt marshes of New England: a community profile. USFWS. Biol. Rep. 85(7.4). 61pp.
- Thayer, G.W., W.J. Kenworthy, & M.S. Fonseca. 1984. The ecology of eelgrass meadows of the Atlantic coast: a community profile. USFWS. FWS/OBS-84/02. 147pp.
- Thompson, E. 1995. Natural Communities of Vermont: Uplands and Wetlands. Vermont Nongame and Natural Heritage Program, Department of Fish and Wildlife, Agency of Natural Resources. Waterbury, VT.
- Thompson, E. and R. Popp. 1995. Calcareous open fens and riverside seeps of Vermont: some sites of ecological importance. Unpublished report, Vermont Nongame and Natural Heritage Program, Department of Fish and Wildlife, Agency of Natural Resources. Waterbury, VT.
- Tiner, Ralph W. 1998. In search of swampland: a wetland sourcebook and field guide. Rutgers University Press. 264pp.
- Tofte-Dorr, Leah. 1998. Vegetative inventory & classification of Martha's Vineyard's Coastal Pond Cove Wetlands. MS Thesis, Antioch New England.
- Veit, R.R. & W.R. Petersen. 1993. Birds of Massachusetts. Massachusetts Audubon Society, Lincoln, MA. 514pp.
- Vickery, P.D. & P.W. Dunwiddie, eds. 1997. Grasslands of northeastern North America: ecology and conservation of native and agricultural landscapes. Proceedings from a conference, 1994. Massachusetts Audubon Society. Lincoln, MA.
- Weatherbee, Pamela B. 1992. Natural plant communities of Berkshire County, Massachusetts. *Rhodora* 94:171-209.
- Weatherbee, Pamela B. 1996. Flora of Berkshire County. The Berkshire Museum, The Studley Press, Inc. Dalton, MA. 123 pp.
- Weatherbee, Pamela B. and G.E. Crow. 1990. Phytogeography of Berkshire County, Massachusetts. *Rhodora* 92: 232-256.
- Whitlatch, R.B. 1982. The ecology of New England tidal flats: a community profile. USFWS FWS/OBS-81/01. 125pp.
- Whitney, G.G. & D.R. Foster. 1988. Overstorey composition and age as determinants of the understorey flora of woods of central New England. *Jour. Ecol.* 76:867-876.
- Zebryk, T.M. 1994. Vegetation and site characteristics of a *Nyssa*-dominated wetland in central New England. Unpublished report.
- Zebryk, T.M. 1998. Biological surveys of East Mountain Wildlife Management Area and vicinity. Holyoke-West Springfield-Westfield, Hampden County, Massachusetts. Unpublished report to the Massachusetts Department of Fisheries, Wildlife, and Environmental Law Enforcement, Biodiversity Initiative, Ecological Restoration Program. Westborough, MA.
- Zika, Peter and K.T. Dunn. 1985. Rare plants on ultramafic soils in Vermont. *Rhodora* 87:293-304.

INVENTORY NEEDS

Inven_Needs	Community	Community Name	SRANK
1			
(little information available; high inventory need)			
1	CE2B300000	ESTUARINE INTERTIDAL: BRACKISH TIDAL MARSH	S1
1	CP1A2B4000	HIGH-TERRACE FLOODPLAIN FOREST	S2
1	CP1A2A2000	BLACK ASH SEEPAGE SWAMP	S2
1	CP1B1B1000	BLACK SPRUCE-TAMARACK FORESTED BOG	S2
1	CP2A0B1300	CALCAREOUS PONDSHORE/LAKESHORE	S2
1	CP2A0B2200	RIVERSIDE SEEP	S2
1	CP1A110000	SPRUCE-FIR BOREAL SWAMP	S3
1	CP2A0A2100	KETTLEHOLE WET MEADOW	S3
1	CP2A0B2500	POINTBAR, BEACH AND ISLAND SHORE	S3
1	CP2B0B1000	ACIDIC GRAMINOID FEN	S3
2			
(some information available; moderate inventory need)			
2 (Cape Cod)	CE2B400000	ESTUARINE INTERTIDAL: FRESHWATER TIDAL MARSH	S1
2	CE2C000000	ESTUARINE INTERTIDAL: FRESH / BRACKISH TIDAL SHRUBLAND	S1
2	CE1A000000	ESTUARINE INTERTIDAL: FRESH / BRACKISH TIDAL SWAMP	S1
2	CT2B2B0000	SANDPLAIN HEATHLAND	S1
2	CT1A2A1100	MARITIME JUNIPER WOODLAND / SHRUBLAND	S1
2	CT2B1F1000	SCRUB OAK SHRUBLAND	S1
2	CT1A2A1000	MARITIME OAK - HOLLY FOREST / WOODLAND	S1
2	CT2A1C0000	CALCAREOUS ROCKY SUMMIT/ROCK OUTCROP	S2
2	CT2B2B1000	DRY RIVERSIDE BLUFF	S2
2	CP1A2B5000	COBBLE BAR FOREST	S2
2	CP1B2A0000	BLACK GUM SWAMP	S2
2	CP2A0B1200	COASTAL PLAIN PONDSHORE	S2
2	CE3A200000	ESTUARINE SUBTIDAL FRESH / BRACKISH FLATS	S2
2	CE2A200000	ESTUARINE INTERTIDAL: FRESH / BRACKISH FLATS	S2
2	CP1A2A1A00	ALLUVIAL RED MAPLE SWAMP	S3
2	CP2B0B2000	ACIDIC SHRUB FEN	S3
2	CE2A100000	ESTUARINE INTERTIDAL: SALINE /BRACKISH FLATS	S3
2	CP1A120000	HEMLOCK-HARDWOOD SWAMP	S4
2	CP2A0A1200	DEEP EMERGENT MARSH	S4
2	CP2A0A1300	SHALLOW EMERGENT MARSH	S4
Inven_Needs	Community ELCODE	Community Name	SRANK

2	CT2A4B0000	MARITIME ROCK CLIFF COMMUNITY	S2
2	CT2B1E0000	MARITIME EROSIONAL CLIFF COMMUNITY	S2
2	CT1B2A0000	YELLOW OAK DRY CALCAREOUS FOREST	S2
2	CT1C2B2000	CALCAREOUS FOREST SEEP COMMUNITY	S2
2	CT2A2B0000	CIRCUMNEUTRAL ROCK CLIFF COMMUNITY	S3
2	CT2A2C0000	CALCAREOUS ROCK CLIFF COMMUNITY	S3
2	CT2A3A0000	RIVERSIDE ROCK OUTCROP COMMUNITY	S3
2	CT2A4A1000	MARITIME SHRUBLAND COMMUNITY	S3
2	CT1A2A2000	COASTAL FOREST / WOODLAND	S3
2	CT1B1A2000	CIRCUMNEUTRAL TALUS FOREST / WOODLAND	S3
2	CT1B1A3000	CALCAREOUS TALUS FOREST / WOODLAND	S3
2	CT1A3B0000	BLACK OAK - SCARLET OAK FOREST / WOODLAND	S3S4
2	CT2A1A0000	ACIDIC ROCKY SUMMIT / ROCK OUTCROP COMMUNITY	S4
2	CT2A2A2000	ACIDIC ROCK CLIFF COMMUNITY	S4
2	CT1B1A1000	ACIDIC TALUS FOREST / WOODLAND	S4
2	CT1B1B0000	DRY, RICH ACIDIC OAK FOREST	S4
2	CT1C2B1000	FOREST SEEP COMMUNITY	S4
2	CP2A0A2000	WET MEADOW	S4
2	CP2A0B1100	INLAND ACIDIC PONDSHORE/LAKESHORE	S4
2	CP2A0B2100	MUD FLAT	S4
2	CP2A0B2300	LOW-ENERGY RIVERBANK	S4
2	CP2B0C2000	HIGHBUSH BLUEBERRY THICKET	S4
2	CE3A100000	ESTUARINE SUBTIDAL: SALINE/ BRACKISH FLATS	S4
2	CP1A2A1000	RED MAPLE SWAMP	S5
2	CP2A0C0000	SHRUB SWAMP	S5

Inven_Needs	Community	Community Name	SRANK
3			
(good amount of information available; low inventory need)			
3	CT2A1D0000	SERPENTINE OUTCROP COMMUNITY	S1
3	CT2B2A0000	SANDPLAIN GRASSLAND	S1
3	CT2B2A1000	CULTURAL GRASSLAND	-
3	CT2A1A1200	MARITIME PITCH PINE ON DUNES	S1
3	CP2A0A1100	COASTAL INTERDUNAL MARSH/SWALE	S1
3	CP2B0A3000	CALCAREOUS BASIN FEN	S1
3	CT2B1B0000	MARITIME DUNE COMMUNITY	S2
3	CT2B1F0000	PITCH PINE - SCRUB OAK COMMUNITY	S2
3	CT2A1A1000	RIDGETOP PITCH PINE - SCRUB OAK COMMUNITY	S2
3	CT1B2B1000	HICKORY - HOP HORNBEAM FOREST / WOODLAND	S2
3	CT1D300000	HIGH ELEVATION SPRUCE – FIR FOREST / WOODLAND	S2
3	CP1A2A3000	BLACK GUM - PIN OAK - SWAMP WHITE OAK "PERCHED" SWAMP	S2
3	CP1A2B1000	MAJOR-RIVER FLOODPLAIN FOREST	S2
3	CP1A2B2000	TRANSITIONAL FLOODPLAIN FOREST	S2
3	CP1A2B3000	SMALL-RIVER FLOODPLAIN FOREST	S2
3	CP1B1A1000	COASTAL ATLANTIC WHITE CEDAR SWAMP	S2
3	CP1B1A2000	INLAND ATLANTIC WHITE CEDAR SWAMP	S2
3	CP1B1A3000	NORTHERN ATLANTIC WHITE CEDAR SWAMP	S2
3	CP1B1A4000	SEASONALLY-FLOODED ATLANTIC WHITE CEDAR SWAMP	S2
3	CP1B1B2000	ATLANTIC WHITE CEDAR FORESTED BOG	S2
3	CP1B2B0000	BLACK ASH-TAMARACK-RED MAPLE CALCAREOUS SEEPAGE SWAMP	S2
3	CP2B0A1000	CALCAREOUS SLOPING FEN	S2
3	CP2B0A2000	CALCAREOUS SEEPAGE MARSH	S2
3	CP2B0C1100	KETTLEHOLE LEVEL BOG	S2
3	CM2A000000	MARINE INTERTIDAL: ROCKY SHORE	S2
3	CE3B000000	ESTUARINE SUBTIDAL: COASTAL SALT POND	S2
3	CE2B200000	ESTUARINE INTERTIDAL: COASTAL SALT POND	S2
3	CT2A1B0000	CIRCUMNEUTRAL ROCKY SUMMIT/ ROCK OUTCROP COMMUNITY	S2S3
3	CT1C2A0000	RICH, MESIC FOREST COMMUNITY	S3
3	CP2A0B2400	HIGH-ENERGY RIVERBANK	S3
3	CP2B0C1000	LEVEL BOG	S3
3	CT2B1A0000	MARITIME BEACH STRAND COMMUNITY	S3
3	CE2B100000	ESTUARINE INTERTIDAL: SALT MARSH	S3

Inven_Needs	Community	Community Name	SRANK
3	CT1A3A0000	RIDGETOP CHESTNUT OAK FOREST / WOODLAND	S4
3	CT1B2B0000	OAK - HICKORY FOREST	S4
3	CT1C1C0000	HEMLOCK RAVINE COMMUNITY	S4
3	CT1B300000	RED OAK - SUGAR MAPLE TRANSITION FOREST	S4
3	CT1D100000	SPRUCE - FIR - NORTHERN HARDWOODS FOREST	S4
3	CM1A000000	MARINE SUBTIDAL: FLATS	S4
3	CM2B000000	MARINE INTERTIDAL: GRAVEL / SAND BEACH	S4
3	CM2C000000	MARINE INTERTIDAL: FLATS	S4
3	CT1A200000	PITCH PINE - OAK FOREST	S5
3	CT1A100000	WHITE PINE - OAK FOREST	S5
3	CT1B100000	OAK - HEMLOCK - WHITE PINE FOREST	S5
3	CT1A1A0000	SUCCESSIONAL WHITE PINE FOREST	S5
3	CT1A300000	MIXED OAK FOREST	S5
3	CT1C000000	NORTHERN HARDWOODS - HEMLOCK - WHITE PINE FOREST	S5
3	CT1C1B0000	SUCCESSIONAL NORTHERN HARDWOODS	S5

PAGE GUIDE IN BRIEF

(See complete descriptions on pages v-viii)

Community Name:

Name used to describe the community in Massachusetts

Community ELCODE:

Unique ten digit alphanumeric element code (ELCODE) assigned to the community.

SRANK:

Community state rank (SRANK).

S1= Typically 5 or fewer occurrences, very few remaining acres or miles of stream, or especially vulnerable to extirpation in Massachusetts for other reasons.

S2= Typically 6-20 occurrences, few remaining acres or miles of stream, or very

vulnerable to extirpation in Massachusetts for other reasons.

S3= Typically 21-100 occurrences, limited acreage or miles of stream in Massachusetts.

S4= Apparently secure in Massachusetts.

S5= Demonstrably secure in Massachusetts.

SU= Status unknown in Massachusetts.

Tracked:

Yes means that the community is tracked in MNHESP's database. MNHESP tracks examples of communities that are ranked S1-S3. Communities that are ranked S4 or S5 generally are not tracked, except for exemplary occurrences.

Concept:

Brief general description or word-picture of the community.

Environmental setting:

Detailed description of the landscape setting, soils, water chemistry, and other physical characteristics of the community.

Vegetation Description:

Detailed description of the vegetation structure and characteristic plant species of the community.

Associations:

List of the vegetation associations that have been described in Massachusetts that are either equivalent to the community or included within the community

Habitat values for Associated Fauna:

Description of the habitat that the community provides for animals, including birds, small mammals, amphibians, invertebrates, etc.

Associated rare plants:

A list of rare plants that are known to occur in the community type.

E= State Endangered, T= State Threatened, SC= State Special Concern, WL= State Watch List, H= State Historic

Associated rare animals:

A list of rare animals that are known to occur in the community type.

Examples with public access (Terrestrial) or Examples (Palustrine):

Representative examples of the community on lands with public access.

Threats:

A description of known threats to the community.

Management needs:

A description of management activities that may be necessary to maintain community occurrences and the quality of those occurrences.

Inventory need rank:

Each community is ranked from 1 to 3 based on its need for inventory efforts.

Communities with high need (rank of 1) are lacking field data, and communities ranked 3 have low need for inventory.

Inventory comments:

Written comments providing specifics on the inventory needs of the community.

Synonyms:

Names used in other natural community classifications.

USNVC/TNC: National Vegetation Classification (Sneddon et al. 1998)

MA (old name): Rawinski (1984)

ME: Maine (Maine Natural Heritage Program 1991)

VT: Vermont (Thompson 1995)

NH: New Hampshire (Sperduto 1997, 1994 (Palustrine))

NY: New York (Reschke 1990)

CT: Connecticut (Metzler and Barrett, 1996)

RI: Rhode Island (Enser 1995)

Weatherbee: Berkshire County. (Weatherbee, 1996), Terrestrial Section

Golet & Larson: Palustrine. (Golet & Larson, 1974)

Author: Person responsible for writing community description.

Date: Date last revised.

