

Key to Natural Communities

Introduction

Natural communities are defined as recurring assemblages of species found in particular physical environments. Classifying natural communities enables ecologists, land managers, and others to communicate effectively and to make management decisions regarding ecological systems.

Based on more than 20 years of ecological research, the New Hampshire Natural Heritage Bureau (NHB) developed a classification of all the known natural communities in the state (does not include most communities in subtidal, deep fresh water, or subterranean habitats). This work was published as *Natural Communities of New Hampshire* (Sperduto and Nichols) in 2004, and an updated second edition will be available on the NHB website in 2011.

Each natural community type is distinguished by three characteristics: (1) a distinct plant species composition; (2) a consistent physical structure (such as forest, shrubland, or grassland); and (3) a specific combination of physical conditions (such as nutrients, drainage, and climate) and disturbance regime (such as fire, wind, and flooding). Natural community types are usually defined in terms of plants because they are easy to study, often compose the physical structure to which most other organisms respond, and are sensitive indicators of physical and biological factors that influence many types of organisms.

The purpose of this key is to provide the user with a step-by-step way to identify natural communities in the state. It is divided into two major groups: *wetlands*, such as marshes, swamps, and fens, and *uplands*, which are primarily forests, but which also include bare mountain tops, coastal sand dunes, and other open, non-forested habitats.

The sequence of keys in this document is designed to aid in the identification of major community groups and specific natural community types by reducing detailed differences down to a series of consecutive, dichotomous ("either-or") decisions between two sets of characteristics. Each pair of choices (only one of which is selected for a given study area) shares the same number. The first choice in each numbered couplet is designated "a" and the second "b." The user selects the most accurate description from the two options, and this description then leads either to another couplet (and another decision) or to a solution (a major group or natural community type name). If variability in the composition and relative abundance of plant species sometimes makes more than one choice appropriate for different examples of a community, that community is listed accordingly in more than one part of the key.

Important notes about the key

1. It may be important to consult the more detailed community descriptions available in the current edition of *Natural Communities of New Hampshire* to confirm a community determination or to decide between two or more types. Any given example in the field may not conform or "fit" cleanly into the concept of a single community type, since descriptions are based on information from a limited number of samples. Community types are essentially idealized descriptions of segments of the continuous gradient of vegetation and environmental conditions that exist on the ground. It is often preferable to think of any one example as *approximating* one natural community type or even more than one type, rather than inappropriately "forcing" it into one community or another.
2. For forested communities, this key is designed for use in relatively mature and undisturbed community examples of at least one acre in size. Either early successional occurrences or those significantly disturbed or manipulated by humans may be difficult to key out based solely on current vegetation. In such instances, a community determination should include particular attention to late-successional tree species in the understory and/or a combination of soil drainage, mineralogy, and texture characteristics and features of adjacent undisturbed communities. Ideally, the vegetation being considered should be reasonably homogeneous, with no major internal features that would not be considered representative (inclusions of small patch communities, variation in seral stage, etc.).

3. Keying out examples transitional between the communities should be avoided. Transitional areas share certain characteristics that help identify them. Their width is typically much narrower than the communities on either side of the transition. These areas usually support species common to both communities and vegetation structure may be intermediate. Transitional areas are often associated with abrupt physical gradients associated with hydrology, nutrients, elevation, slope, aspect, etc.
4. Forest community types are not synonymous with tree canopy cover types as used by SAF or other groups. Although there is a reliance on tree canopy species in certain sections of the key, and to some extent in the naming of the community types, they are *not* simply cover types. When trees are used for names, they generally reflect mid- to late-successional composition, but understory species have also been considered in differentiating and describing the types. Overstory composition may correlate closely with a single natural community type, but this is not always the case. For instance, a white pine cover type could correspond to one of several community types. On the other hand, some cover types may be specific to a community but not be the only cover type possible for that community.
5. Species composition and relative abundance are used in various combinations to differentiate communities. The relative abundance of a species or group of species can be an important determinant of a community type, but this is not always the case. Two types of species are particularly important for identifying natural community type: differential and characteristic species.

Differential species are those used to distinguish between two community types or groups of communities. A particular species may occur in many community types, but it is used as a *differential* species only when it has diagnostic value for deciding between two *particular* community types or groups of communities. For instance, white ash and basswood are among the differential species used to distinguish acidic northern hardwood forests from enriched northern hardwood forest (they are only present in the latter), but they have relatively little diagnostic value when differentiating among the several types of enriched northern hardwood forests. In some cases, differential species may only be present in low abundance (e.g., <1% cover), but still have a diagnostic value.

Characteristic species are those that often occur in a particular community, and collectively help characterize the type; however, they are not always useful as differential species, since they can often occur in many community types.

KEY TO THE NATURAL COMMUNITIES OF NEW HAMPSHIRE

- 1a. Communities that occur on moderately well to excessively well drained, non-hydric soils that are never or rarely flooded.

Key to Upland Natural Communities

- 1b. Communities that occur on saturated to somewhat poorly drained soils or regularly inundated organic or mineral soils (hydric), and supporting wetland vegetation; low floodplain forests may be either hydric or non-hydric, but are included in this part of the key; communities may only be temporarily or seasonally flooded, but support wetland vegetation and soils.

Key to Wetland Natural Communities

KEY TO UPLAND NATURAL COMMUNITIES

- 1a. Tree canopy cover generally >25% (forests and woodlands; includes examples of rocky ridge communities with sparse woodland vegetation) 2
- 1b. Tree canopy cover generally <25% cover, or less than 6 ft. tall (includes barrens with a sparse cover of shrubs or herbaceous species)..... 45

- 2a. Forests on enriched sites dominated by hardwood species such as sugar maple (*Acer saccharum*), white ash (*Fraxinus americana*), or hickories (*Carya* spp.); yellow birch (*Betula alleghaniensis*) and American beech (*Fagus grandifolia*) may be present but are not dominant; conifers such as white pine (*Pinus strobus*), hemlock (*Tsuga canadensis*), and red spruce (*Picea rubens*) are generally sparse or absent; enriched-site indicators include basswood (*Tilia americana*), Christmas fern (*Polystichum acrostichoides*), blunt-lobed hepatica (*Anemone americana*), baneberries (*Actaea* spp.), and wide-leaved sedges (*Carex* spp.)..... 3
- 2b. Forests on rocky ridges, till, sand or other fluvial soils without notable nutrient enrichment (rich site indicators in 2a absent); dominant species can include white oak (*Quercus alba*), white pine (*Pinus strobus*), hemlock (*Tsuga canadensis*), American beech (*Fagus grandifolia*), yellow birch (*Betula alleghaniensis*), red spruce (*Picea rubens*), or balsam fir (*Abies balsamea*)..... 8

- 3a. Enriched hardwood forests with few or no oak species on mesic loamy soils; sugar maple (*Acer saccharum*) dominates; generally not on talus 4
- 3b. Enriched forests or woodlands with oaks on dry or dry-mesic, often rocky, soils 5

- 4a. One or more of the following rich mesic forest differential species is present (absent in semi-rich mesic forests): blue cohosh (*Caulophyllum thalictroides*), ostrich fern (*Matteuccia struthiopteris* ssp. *pennsylvanica*), maidenhair fern (*Adiantum pedatum*), bland sweet-cicely (*Osmorhiza claytonii*), Dutchman’s-breeches (*Dicentra cucullaria*), silvery false spleenwort (*Deparia acrostichoides*), or Goldie’s wood fern (*Dryopteris goldiana*); usually a broad (but variable) diversity of enriched site species are also present, including some listed for alternate choice; sugar maple (*Acer saccharum*) is dominant, with American beech (*Fagus grandifolia*) infrequent or absent **Rich mesic forest**
- 4b. The enriched-site indicator species listed in the alternate choice absent or essentially so; species indicative of only moderately enriched conditions are present, including baneberries (*Actaea* spp.), foam-flower (*Tiarella cordifolia*), wood nettle (*Laportea canadensis*), round-leaved violet (*Viola rotundifolia*), Jack-in-the-pulpit (*Arisaema triphyllum*), axillary goldenrod (*Solidago caesia*), Christmas fern (*Polystichum acrostichoides*), alternate-leaved dogwood (*Swida alternifolia*), basswood (*Tilia americana*), white ash (*Fraxinus americana*), red elderberry (*Sambucus racemosa*), millet grass (*Milium effusum* ssp. *cisatlanticum*), ironwood (*Ostrya virginiana*), and Braun's holly fern (*Polystichum braunii*); diversity and abundance of these enriched-site species is generally low compared to that of the alternate choice; sugar maple (*Acer saccharum*) dominates, although American beech (*Fagus grandifolia*) may be co-dominant, and yellow birch (*Betula alleghaniensis*) may be present; forests of till, talus, and river terrace-flat landscape positions **Semi-rich mesic sugar maple forest**

- 5a. Semi-rich forest with herbaceous layer dominated by dense “lawn” of Pennsylvania sedge (*Carex pensylvanica*) on open ridges and upper slopes of hills and low mountains; rich site indicators include Michaux's sandplant (*Minuartia michauxii*)*, rusty cliff fern (*Woodsia ilvensis*), and blunt-lobed hepatica (*Anemone americana*)..... **Red oak - ironwood - Pennsylvania sedge woodland**
- 5b. Rich or semi-rich forests in which Pennsylvania sedge (*Carex pensylvanica*) may be present, but does not form the extensive “grassy lawns” characteristic of the alternate choice 6

- 6a. Rich rocky woodlands with one or more of the following herbaceous indicator species: ebony spleenwort (*Asplenium platyneuron*), early small-flowered-saxifrage (*Micranthes virginiensis*), broad-leaved sedge (*Carex platyphylla*), blackseed mountain rice (*Piptatherum racemosum*), sicklepod rockcress (*Boechera canadensis*)*, and smooth rockcress (*Boechera laevigata*)* 7
- 6b. Semi-rich rocky woods lacking indicator species listed in alternate choice; red oak (*Quercus rubra*), sugar maple (*Acer saccharum*), and white ash (*Fraxinus americana*) dominate the canopy; typical semi-rich herbs include Christmas fern (*Polystichum acrostichoides*), hairy Solomon's-seal (*Polygonatum pubescens*), red baneberry (*Actaea rubra*), eastern woodland sedge (*Carex blanda*), pointed-leaved tick-trefoil (*Hylodesmum glutinosum*), and round-leaved violet (*Viola rotundifolia*) **Semi-rich oak - sugar maple forest**

7a. Forests or woodlands dominated by Appalachian species such as white oak (<i>Quercus alba</i>), shagbark hickory (<i>Carya ovata</i>), pignut hickory (<i>Carya glabra</i>), and flowering dogwood (<i>Benthamidia florida</i>); only found in southern third of the state	Rich Appalachian oak rocky woods
7b. Forests or woodlands dominated by red oak (<i>Quercus rubra</i>) and sugar maple (<i>Acer saccharum</i>), with basswood (<i>Tilia americana</i>) and white ash (<i>Fraxinus americana</i>); lacking Appalachian species listed in the alternate choice; found primarily south of the White Mountains	Rich red oak rocky woods
8a. Forests and woodlands with an abundance of Appalachian oak and/or other southern species, including white oak (<i>Quercus alba</i>), black oak (<i>Quercus velutina</i>), chestnut oak (<i>Quercus montana</i>), pitch pine (<i>Pinus rigida</i>), eastern red cedar (<i>Juniperus virginiana</i>), shagbark hickory (<i>Carya ovata</i>), flowering dogwood (<i>Benthamidia florida</i>), sassafras (<i>Sassafras albidum</i>), and mountain laurel (<i>Kalmia latifolia</i>); communities mainly limited to less than 1,000 ft. elevation in southern NH, with some disjunct examples in south-central NH on steep, south-facing hills.....	9
8b. Forests and woodlands lacking Appalachian indicator species listed in alternate choice	20
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9b. Appalachian oak species present and typically dominant or co-dominant	10
10a. Coastal woodlands on bedrock or sand that are influenced by maritime climate and salt spray	11
10b. Forests or woodlands away from direct maritime influences.....	12
11a. Woodlands on coastal rocky promontories; dominant trees are eastern red cedar (<i>Juniperus virginiana</i>) and black oak (<i>Quercus velutina</i>), with frequent black cherry (<i>Prunus serotina</i>).....	Coastal rocky headland
11b. Dense woodlands or wooded thickets in protected hollows of dune systems; dominant species include black cherry (<i>Prunus serotina</i>), dwarf shadbush (<i>Amelanchier spicata</i>), quaking aspen (<i>Populus tremuloides</i>), red maple (<i>Acer rubrum</i>), and occasionally pitch pine (<i>Pinus rigida</i>).....	Maritime wooded dune
12a. Forests with mountain laurel (<i>Kalmia latifolia</i>) abundant in the understory.....	Oak - mountain laurel forest
12b. Mountain laurel (<i>Kalmia latifolia</i>) is sparse or absent in the understory	13
13a. Forest or woodland ridgetops and sideslopes distinguished by the dominance or co-dominance of chestnut oak (<i>Quercus montana</i>)	Chestnut oak forest/woodland
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14a. Woodland or sparse woodland on talus with Appalachian species such as shagbark hickory (<i>Carya ovata</i>), bitternut hickory (<i>Carya cordiformis</i>), white oak (<i>Quercus alba</i>), black oak (<i>Quercus velutina</i>), chestnut oak (<i>Quercus montana</i>) and mountain laurel (<i>Kalmia latifolia</i>); other species typical of talus include black birch (<i>Betula lenta</i>), rock polypody (<i>Polypodium virginianum</i>), gooseberries and currants (<i>Ribes</i> spp.) and vines such as fringed bindweed (<i>Fallopia cilinodis</i>), Virginia-creeper (<i>Parthenocissus quinquefolia</i>), and poison-ivy (<i>Toxicodendron radicans</i>); only known from low elevations (<500 ft.) of southern and coastal NH.....	Appalachian wooded talus
14b. Communities not on talus slopes; lacking abundance of talus indicators listed in the alternate choice	15
15a. Communities on rocky ridges; woodlands or sparse woodlands with extensive exposures of bedrock.....	16
15b. Forests or woodlands on till soils or lowland sand plain settings.....	17
16a. Rocky ridge dominated by pitch pine (<i>Pinus rigida</i>)	Pitch pine rocky ridge
16b. Rocky ridge woodland with red oak (<i>Quercus rubra</i>), white pine (<i>Pinus strobus</i>), and Appalachian oaks such as white oak (<i>Quercus alba</i>) and black oak (<i>Quercus velutina</i>); pitch pine (<i>Pinus rigida</i>) may be present, but is not dominant	Appalachian oak - pine rocky ridge
17a. Forests or woodlands on sand plain deposits with pitch pine (<i>Pinus rigida</i>) as a dominant or co-dominant.....	18
17b. Forests or woodlands on till soils dominated by Appalachian oaks.....	19

- 18a. Pitch pine (*Pinus rigida*) is dominant in a discontinuous canopy over a well-developed tall shrub layer of scrub oak (*Quercus ilicifolia*); other canopy species are sparse or absent; absence of fire may result in examples with increased canopy closure and regeneration of white pine (*Pinus strobus*) and early successional hardwoods **Pitch pine - scrub oak woodland**
- 18b. Pitch pine (*Pinus rigida*) is co-dominant with Appalachian oak species such as white oak (*Quercus alba*), scarlet oak (*Quercus coccinea*), and black oak (*Quercus velutina*), as well as white pine (*Pinus strobus*); known only from the lower Merrimack River valley and coastal region..... **Pitch pine - Appalachian oak - heath forest**
- 19a. Dry forests dominated by Appalachian oaks (e.g., *Quercus alba*, *Q. velutina*, *Q. coccinea*, and *Q. montana*) on shallow-to-bedrock or otherwise coarse, dry soils; heath layer with blueberries and huckleberries is typical as well as other dry-site species such as whorled yellow-loosestrife (*Lysimachia quadrifolia*), Blue Ridge sedge (*Carex lucorum*), and wavy hair grass (*Deschampsia flexuosa*); hickories (*Carya* spp.) present in some examples **Dry Appalachian oak forest**
- 19b. Mesic and dry-mesic forests with a more diverse tree canopy including red oak (*Quercus rubra*), white pine (*Pinus strobus*), black oak (*Quercus velutina*), red maple (*Acer rubrum*), and sometimes black birch (*Betula lenta*); other birches, hickories, hemlock, and American beech may also be present; heath shrub layer is absent or sparse, and herb species more indicative of dry sites listed in the alternate choice absent or in low abundance; common herbs and shrubs include partridge-berry (*Mitchella repens*), eastern spicy-wintergreen (*Gaultheria procumbens*), wild sarsaparilla (*Aralia nudicaulis*), Canada-mayflower (*Maianthemum canadense*), and clubmosses such as flat-branched tree-clubmoss (*Dendrolycopodium obscurum*), Hickey's tree-clubmoss (*Dendrolycopodium hickeyi*), and southern ground-cedar (*Diphasiastrum digitatum*) **Mesic Appalachian oak - hickory forest**
- 20a. Forests, woodlands, or rocky ridges dominated by northern conifers; forests typically dominated by red spruce (*Picea rubens*) and/or balsam fir (*Abies balsamea*); paper birch (*Betula papyrifera*) and/or heart-leaved paper birch (*Betula cordifolia*) are frequent successional associates; black spruce (*Picea mariana*) may occur in some communities; includes rocky ridges and woodlands dominated by red pine (*Pinus resinosa*), Jack pine (*Pinus banksiana*)*, or northern white cedar (*Thuja occidentalis*), as well as rocky ridges with white pine (*Pinus strobus*) and red oak (*Quercus rubra*) between 1,000 and 2,000 ft. elevation..... **21**
- 20b. Hardwoods, white pine (*Pinus strobus*), or hemlock (*Tsuga canadensis*) are dominant; when present, spruce and fir are at most co-dominant along with the northern hardwoods yellow birch (*Betula alleghaniensis*), American beech (*Fagus grandifolia*), and sugar maple (*Acer saccharum*)..... **34**
- 21a. Communities with red spruce (*Picea rubens*) and/or balsam fir (*Abies balsamea*) as dominant or co-dominant; paper birch (*Betula papyrifera*) and/or heart-leaved paper birch (*Betula cordifolia*) are frequent successional associates; black spruce (*Picea mariana*) may occur in some communities **22**
- 21b. Rocky ridges and woodlands dominated by red pine (*Pinus resinosa*), Jack pine (*Pinus banksiana*)*, northern white cedar (*Thuja occidentalis*), or red oak (*Quercus rubra*) and/or white pine (*Pinus strobus*)..... **30**
- 22a. Communities with woodland to sparse woodland structure on rocky ridge settings..... **23**
- 22b. Forests or woodlands on till soils or accumulations of talus **24**
- 23a. Community with fairly dense stratum of medium height to tall shrubs such as mountain holly (*Ilex mucronata*), rhodora (*Rhododendron canadense*), Labrador tea (*R. groenlandicum*), sheep laurel (*Kalmia angustifolia*), and withe-rod (*Viburnum nudum* var. *cassinoides*) interspersed with short- to moderate-height red spruce (*Picea rubens*), black spruce (*Picea mariana*), and/or balsam fir (*Abies balsamea*) trees; typically found between 2,500 and 4,000 ft. elevations in the White Mtns. and scattered other peaks; in mesic to wet-mesic settings, such as flat ridgetops or protected concavities, with shallow moist organic layer over bedrock..... **Montane heath woodland**
- 23b. Community with canopy characterized by red spruce (*Picea rubens*); rocky openings characterized by the presence of heath shrubs and three-toothed cinquefoil (*Sibbaldiopsis tridentata*); generally occurs between 1,700 and 3,000 ft. elevation..... **Red spruce - heath - cinquefoil rocky ridge**
- 24a. Woodlands on large block talus at base of slopes, in deep ravines, or on north aspects; black spruce (*Picea mariana*) and red spruce (*Picea rubens*) present, with lush carpets of mosses, liverworts, and rock polypody (*Polypodium virginianum*) on talus boulders... **Spruce - moss wooded talus**
- 24b. Forests on till soils or talus, lacking abundance of rock polypody (*Polypodium virginianum*)..... **25**

- 25a. Hemlock (*Tsuga canadensis*) and/or yellow birch (*Betula alleghaniensis*) are dominant or co-dominant with red spruce (*Picea rubens*) **26**
- 25b. Red spruce (*Picea rubens*) and/or balsam fir (*Abies balsamea*) are dominant or co-dominant; black spruce (*Picea mariana*) is co-dominant in some communities; yellow birch (*Betula alleghaniensis*), if present, may be frequent, but is not dominant or co-dominant **27**
- 26a. Various combinations of sugar maple (*Acer saccharum*), American beech (*Fagus grandifolia*), and yellow birch (*Betula alleghaniensis*), mixed with a usually subdominant component of red spruce (*Picea rubens*) and balsam fir (*Abies balsamea*); hemlock (*Tsuga canadensis*) is absent; found primarily on upland till soils above 2,000 ft. elevation **Northern hardwood - spruce - fir forest**
- 26b. Hemlock (*Tsuga canadensis*) and red spruce (*Picea rubens*) present in abundance with or without mixtures of northern hardwoods (maples and birches); found on upland till soils, and sloping and flat areas of river and kame terrace soils; white and red pine and other conifers are occasional on river and kame terrace soils..... **Hemlock - spruce - northern hardwood forest**
- 27a. Spruce and spruce-fir forests in valley bottom settings, mostly at lower elevations (usually 1,000–2,500 ft.) north of the White Mtns., occasionally at higher elevations in valley bottoms in the White Mtns.; soils are typically somewhat poorly to moderately well drained..... **28**
- 27b. Well drained fir and spruce-fir forests on mountain side slopes and summits at high elevations (usually 2,500-4,500 ft.), and occasionally on rocky slopes at lower elevation..... **29**
- 28a. Forests dominated by red spruce (*Picea rubens*) and balsam fir (*Abies balsamea*) on moist lowland sites (typically somewhat poorly to moderately well drained); black spruce (*Picea mariana*) is absent or present in low abundance **Lowland spruce - fir forest**
- 28b. Black spruce (*Picea mariana*) is a dominant or co-dominant canopy tree along with red spruce (*Picea rubens*); balsam fir (*Abies balsamea*) is less abundant or locally absent; on somewhat poorly to moderately well drained, silty soils in high-elevation mountain valley bottoms of the upper East Branch Pemigewasset River valley in the White Mtns. and in extreme northern NH..... **Montane black spruce - red spruce forest**
- 29a. Balsam fir (*Abies balsamea*) dominates; trees generally less than 30 ft. in height; usually 3,500–4,500 ft. elevation, or lower in exposed settings and higher in protected ravine settings; red spruce (*Picea rubens*), yellow birch (*Betula alleghaniensis*), and paper birch (*Betula papyrifera*) absent or in relatively low abundance; heart-leaved paper birch (*Betula cordifolia*) and showy mountain-ash (*Sorbus decora*) are the only prominent hardwoods); morphs to a short, scrubby woodland that transitions to krummholz (<6 ft. tall)..... **High-elevation balsam fir forest**
- 29b. Red spruce (*Picea rubens*) and balsam fir (*Abies balsamea*) are among dominants; heart-leaved paper birch (*Betula cordifolia*), paper birch (*Betula papyrifera*), yellow birch (*Betula alleghaniensis*), American mountain-ash (*Sorbus americana*), and showy mountain-ash (*Sorbus decora*) may be common; generally at elevations between 2,500 and 3,500 ft..... **High-elevation spruce - fir forest**
- 30a. Rocky ridges or sandy woodlands dominated or co-dominated by red pine (*Pinus resinosa*), or rocky ridges dominated by red oak (*Quercus rubra*) and/or white pine (*Pinus strobus*)..... **31**
- 30b. Forests or woodlands dominated by northern white cedar (*Thuja occidentalis*) or rocky ridges dominated by Jack pine (*Pinus banksiana*)*..... **33**
- 31a. Rocky ridges dominated by red pine or by red oak (*Quercus rubra*) and/or white pine (*Pinus strobus*); may have a forest or woodland structure..... **32**
- 31a. Forests on sandy soil dominated by some combination of red pine and white pine (*Pinus strobus*); balsam fir (*Abies balsamea*) may be abundant in the understory **Red pine - white pine forest**
- 32a. Red pine (*Pinus resinosa*) is the characteristic tree species; other species such as red oak (*Quercus rubra*), red spruce (*Picea rubens*), and white pine (*Pinus strobus*) may also be present, but red pine is dominant; generally occurs between 750 and 2,700 ft. elevation..... **Red pine rocky ridge**
- 32b. Woodland dominated by red oak (*Quercus rubra*) and sometimes white pine (*Pinus strobus*); red pine (*Pinus resinosa*) may be present, but is not dominant **Red oak - pine rocky ridge**

- 33a. Forests or woodlands dominated by northern white cedar (*Thuja occidentalis*); on ledgy slopes and mesic till uplands; only known north of the White Mtns**Northern white cedar forest/woodland**
- 33b. Rocky ridges dominated by Jack pine (*Pinus banksiana*)*; typically extensive ledges of unvegetated bedrock; only known in White Mtns. at elevations between 1,800 and 3,900 ft.....**Jack pine rocky ridge**
- 34a. Communities on talus slopes, typically with woodland structure; characterized by presence of talus specialists such as mountain maple (*Acer spicatum*), gooseberries and currants (*Ribes* spp.), and vines such as fringed bindweed (*Fallopia cilinodis*), Virginia-creeper (*Parthenocissus quinquefolia*), and American bittersweet (*Celastrus scandens*) **35**
- 34b. Forests on till or sand soils; if on talus, lacking indicator species listed in the alternate choice **36**
- 35a. Talus woodland dominated by yellow birch (*Betula alleghaniensis*), paper birch (*Betula papyrifera*), and heart-leaved paper birch (*Betula cordifolia*), mountain maple (*Acer spicatum*), and mountain-ashes (*Sorbus* spp.); black birch (*Betula lenta*) and oaks (*Quercus* spp.) are absent **Birch - mountain maple wooded talus**
- 35b. Talus forests or woodlands that are characterized by red oak (*Quercus rubra*); black birch (*Betula lenta*) is frequent; high elevation species such as heart-leaved paper birch (*Betula cordifolia*) and mountain-ashes (*Sorbus* spp.) are absent.....**Red oak - black birch wooded talus**
- 36a. Red spruce (*Picea rubens*) is a co-dominant or frequent component in the canopy **37**
- 36b. Red spruce (*Picea rubens*) is absent or sparse **38**
- 37a. Various combinations of sugar maple (*Acer saccharum*), American beech (*Fagus grandifolia*), and yellow birch (*Betula alleghaniensis*), mixed with a significant but subdominant component of red spruce (*Picea rubens*) and balsam fir (*Abies balsamea*); hemlock (*Tsuga canadensis*) is absent; found primarily on upland till soils above 2,000 ft. elevation**Northern hardwood - spruce - fir forest**
- 37b. Hemlock (*Tsuga canadensis*) and red spruce (*Picea rubens*) present in abundance with or without mixtures of northern hardwoods (maples and birches); found on upland till soils, and sloping and flat areas of river and kame terrace soils; white and red pine and other conifers are occasional on river and kame terrace soils.....**Hemlock - spruce - northern hardwood forest**
- 38a. Forests with hemlock (*Tsuga canadensis*) present in modest or greater abundance (>5–10% of canopy or understory late successional species)..... **39**
- 38b. Forests in which hemlock (*Tsuga canadensis*) is sparse or in very low abundance; may be dominated by hardwoods or pine species..... **42**
- 39a. Community dominated by hemlock (*Tsuga canadensis*) or hemlock and white pine (*Pinus strobus*); hardwood species absent from the canopy or in very low abundance (<15%)..... **40**
- 39b. Community is dominated by a mix of hemlock (*Tsuga canadensis*) and other species, including American beech (*Fagus grandifolia*), red oak (*Quercus rubra*), white pine (*Pinus strobus*), and occasionally the northern hardwood species yellow birch (*Betula alleghaniensis*) and sugar maple (*Acer saccharum*)..... **41**
- 40a. Hemlock (*Tsuga canadensis*) co-dominant with white pine (*Pinus strobus*); black birch (*Betula lenta*) frequently present in the canopy.....**Hemlock - white pine forest**
- 40b. Hemlock (*Tsuga canadensis*) constitutes >75% of the canopy.....**Hemlock forest**
- 41a. Hemlock (*Tsuga canadensis*) in abundance with northern hardwoods such as American beech (*Fagus grandifolia*), yellow birch (*Betula alleghaniensis*), and sugar maple (*Acer saccharum*); red oak (*Quercus rubra*) and/or white pine (*Pinus strobus*) typically present, but less so at higher elevations..... **Hemlock - oak - northern hardwood forest**
- 41b. "Transition hardwood" forests, with only minor (or no) presence of sugar maple (*Acer saccharum*) and yellow birch (*Betula alleghaniensis*); hemlock (*Tsuga canadensis*), American beech (*Fagus grandifolia*), red oak (*Quercus rubra*), white pine (*Pinus strobus*), red maple (*Acer rubrum*), paper birch (*Betula papyrifera*), black birch (*Betula lenta*), and black cherry (*Prunus serotina*) all may be present in various combinations; a very common community in southern and central NH below 1,400 ft. elevation.....**Hemlock - beech - oak - pine forest**
- 42a. Hardwood forests dominated by American beech (*Fagus grandifolia*) or a combination of American beech, yellow birch (*Betula alleghaniensis*), and sugar maple (*Acer saccharum*); white pine (*Pinus strobus*) absent or in very low abundance..... **43**

- 42b. Conifer or mixed forests dominated or co-dominated by white pine (*Pinus strobus*); canopy co-dominant may be red oak (*Quercus rubra*) or red pine (*Pinus resinosa*); on dry sandy or rocky soils..... **44**
- 43a. American beech (*Fagus grandifolia*) constitutes >75% of the canopy; low diversity and abundance of herbaceous understory plants..... **Beech forest**
- 43b. American beech (*Fagus grandifolia*) constitutes <75% of the canopy; classic "northern hardwood" forest with American beech co-dominant with yellow birch (*Betula alleghaniensis*) and sugar maple (*Acer saccharum*) **Sugar maple - beech - yellow birch forest**
- 44a. Forest community on sand plain substrates dominated by a mix of white pine (*Pinus strobus*) and red pine (*Pinus resinosa*); balsam fir (*Abies balsamea*) can be frequent in the understory; known primarily from the Ossipee Pine Barrens region..... **Red pine - white pine forest**
- 44b. Forests characterized by a mix of red oak (*Quercus rubra*) and white pine (*Pinus strobus*) on bedrock, till, or sandy outwash settings; red pine (*Pinus resinosa*) and balsam fir (*Abies balsamea*) are sparse or absent **Dryred oak - white pine forest**
- 45a. Communities occur exclusively in coastal settings on sand or bedrock that is being directly influenced by ocean winds, salt spray, and storm surge..... **46**
- 45b. Communities on bedrock, talus, till, or sand not directly influenced by maritime conditions **53**
- 46a. Communities occur on shifting sands between the ocean and estuarine or upland systems **47**
- 46b. Communities occur on exposed bedrock or accumulations of cobbles and other loose rock; many communities found on the Isles of Shoals, small rocky islands 6 miles off the NH coast..... **50**
- 47a. Open beaches between the extra-high tide line and the base of the foredune; vegetation is extremely sparse (<1%); all NH examples heavily impacted by human foot traffic **Maritime sandy beach**
- 47b. Communities on dune areas landward of open beaches **48**
- 48a. Shrublands in protected hollows of dune systems; dominated by the short to moderate height shrubs small bayberry (*Morella caroliniensis*) and beach plum (*Prunus maritima*) **Bayberry - beach plum maritime shrubland**
- 48b. Community characterized by herbaceous plants or low-growing, mat-forming shrubs on open dunes **49**
- 49a. Grasslands on open dunes or dune strands at upper edges of beaches; beach grass (*Ammophila breviligulata*)* is the dominant species, with seaside goldenrod (*Solidago sempervirens*) abundant; hairy hudsonia (*Hudsonia tomentosa*)* is occasional to absent **Beach grass grassland**
- 49b. Interdunal areas dominated by extensive mats of hairy hudsonia (*Hudsonia tomentosa*)*; herbaceous species such as beach grass (*Ammophila breviligulata*)* and seaside goldenrod (*Solidago sempervirens*) are occasional, but collectively amount to only a sparse cover (<5%) **Hudsonia maritime shrubland**
- 50a. Community is dominated by shrubs (>25% cover) such as small bayberry (*Morella caroliniensis*), purple chokeberry (*Aronia floribunda*), black chokeberry (*Aronia melanocarpa*), Virginia rose (*Rosa virginiana*), and poison-ivy (*Toxicodendron radicans*)..... **Maritime shrub thicket**
- 50b. Shrub cover is low to absent (usually <10%)..... **51**
- 51a. Substrate is dominated by cobble and other loose rock..... **Maritime cobble beach**
- 51b. Substrate is primarily exposed bedrock..... **52**
- 52a. Herbaceous cover is generally <5%; typically adjacent to and landward of the **intertidal rocky shore** community **Maritime rocky barren**
- 52b. Herbaceous cover somewhat low to high (>5% to occasionally over 60%); typically adjacent to and landward of the **maritime rocky barren** community **Maritime meadow**

- 53a. Communities in alpine or subalpine settings above 3,000 ft. elevation in the White Mtns; woody vegetation, when present, is stunted (<6 ft. tall); mat forming shrubs, graminoids, mosses, and lichens are the dominant life forms; alpine/subalpine-restricted species include alpine blueberry (*Vaccinium uliginosum*), mountain cranberry (*Vaccinium vitis-idaea*), Bigelow's sedge (*Carex bigelowii*)*, and crowberries (*Empetrum* spp.); alpine occurs above treeline around 4,900 ft.; subalpine occurs at lower elevations where exposure, shallow soils and sometimes fire history allow for the development of subalpine communities..... **54**
- 53b. Communities on bedrock or talus that are not in alpine or subalpine settings, generally below 3,000 ft..... **67**
- 54a. Community is characterized by presence of conifer species such as black spruce (*Picea mariana*), red spruce (*Picea rubens*), and/or balsam fir (*Abies balsamea*) in either krummholz form (<6ft.) or as stunted trees (10-20 ft tall)..... **55**
- 54b. Conifer species in general and krummholz in particular are absent; community may be dominated by herbaceous species or shrubs, or have little vascular vegetation at all **58**
- 55a. Community found at the base of large, open talus slopes and is influenced by ice-cooled air moving beneath the talus; sparse, stunted tree canopy (10-20 ft. tall) composed of black spruce (*Picea mariana*) and/or red spruce (*Picea rubens*), along with other species; well-developed low shrub layer among bare talus boulders includes Labrador tea (*Rhododendron groenlandicum*), sheep laurel (*Kalmia angustifolia*), black crowberry (*Empetrum nigrum*), mountain cranberry (*Vaccinium vitis-idaea*), and alpine blueberry (*Vaccinium uliginosum*); known from a few White Mtn. locations between 2,300–3,400 ft. elevation..... **Subalpine cold-air talus shrubland**
- 55b. Community is characterized by the presence of krummholz (twisted, stunted trees generally <6 ft. in height) comprised of black spruce (*Picea mariana*), red spruce (*Picea rubens*) and/or balsam fir (*Abies balsamea*); on stabilized talus or other substrates **56**
- 56a. Community consists of nearly pure krummholz (>60% cover); black spruce (*Picea mariana*), red spruce (*Picea rubens*), and/or balsam fir (*Abies balsamea*) are the primary krummholz-forming species, with heart-leaved paper birch (*Betula cordifolia*) frequent; elevation range is between 3,500 and 4,900 ft..... **Black spruce - balsam fir krummholz**
- 56b. Heath-krummholz communities in which the cover of krummholz is between 20% and 60%, and is interspersed with dwarf heath and other low shrubs, including Labrador tea (*Rhododendron groenlandicum*), sheep laurel (*Kalmia angustifolia*), crowberries (*Empetrum* spp.), alpine blueberry (*Vaccinium uliginosum*), and mountain cranberry (*Vaccinium vitis-idaea*); usually has substantial areas of exposed bedrock, gravel, or talus (>25%)..... **57**
- 57a. Black spruce (*Picea mariana*) and balsam fir (*Abies balsamea*) are the characteristic krummholz species, although red spruce (*Picea rubens*) is occasional at the lower end of the elevation range; shrubs in alternate choice are typically absent; restricted to elevations in the White Mtns. between 3,500–4,900 ft..... **Labrador tea heath - krummholz**
- 57b. Krummholz is typically comprised of red spruce (*Picea rubens*) and balsam fir (*Abies balsamea*); black spruce (*Picea mariana*) krummholz is rare in this community; prominent heath shrubs present here but absent in the alternate choice include sheep laurel (*Kalmia angustifolia*), rhodora (*Rhododendron canadense*), and mountain holly (*Ilex mucronata*); generally found at elevations between 3,000–3,500 ft. including on peaks south of the White Mtns. **Sheep laurel - Labrador tea heath - krummholz**
- 58a. Community is sparsely vegetated, with either extensive areas of exposed bedrock in the subalpine zone or fields of frost-cracked boulders..... **59**
- 58b. Community is not sparsely vegetated; vegetation is characterized by short graminoids, herbs, or shrubs **60**
- 59a. Lichens are primary vegetative form, growing on extensive fields of frost-cracked boulders; restricted to Presidential Range in the White Mtns. **Felsenmeer barrens**
- 59b. Sparsely vegetated subalpine summits with less than 5–10% cover of vascular plants and several acres of exposed bedrock; vegetation is restricted to cracks and benches that retain thin soils **Subalpine rocky bald**
- 60a. Community is a shrub thicket dominated by green alder (*Alnus viridis* ssp. *crispa*), with other frequent species including meadowsweet (*Spiraea alba* var. *latifolia*); found in wet-mesic conditions of alpine ravines above 4,000 ft. elevation where snow accumulation can be substantial; known from ravines of the Presidential Range, including Tuckerman Ravine and the Great Gulf..... **Alpine ravine shrub thicket**
- 60b. Community is dominated by herbs or dwarf shrubs; tall shrubs such as green alder (*Alnus viridis* ssp. *crispa*) are absent..... **61**

- 61a. Community is a dwarf-shrubland in subalpine settings (3,400–4,800 ft. elevation) in the White Mtns. outside the Presidential Range; alpine blueberry (*Vaccinium uliginosum*) and mountain cranberry (*Vaccinium vitis-idaea*) are dominant species, along with other dwarf shrubs such as red crowberry (*Empetrum atropurpureum*) and three-toothed cinquefoil (*Sibbaldiopsis tridentata*) **Subalpine dwarf shrubland**
- 61b. Alpine dwarf shrublands and meadows on gravel, sand, and rock substrates; communities restricted to higher elevations (4,900–5,800 ft., locally lower in alpine ravines) of the White Mtns., particularly the Presidential Range, Franconia Ridge, and Mt. Moosilauke..... **62**
- 62a. Communities in wet-mesic settings that develop in late-melting snowbank areas, in seeps, and along rills and headwall gullies; diagnostic species include large-leaved goldenrod (*Solidago macrophylla*), bluejoint (*Calamagrostis canadensis*), White Mountain avens (*Geum peckii*)*, tufted clubsedge (*Trichophorum cespitosum*), alpine bistort (*Bistorta vivipara*)*, and Boott's rattlesnake-root (*Nabalus boottii*)* **63**
- 62b. Dry-mesic alpine tundra setting; diagnostic species listed in the alternate choice generally absent **64**
- 63a. Wet snowbanks and rills characterized by the presence of large-leaved goldenrod (*Solidago macrophylla*), wavy hair grass (*Deschampsia flexuosa*), and dwarf blueberry (*Vaccinium cespitosum*)*; other species characteristic of wet sites in the alpine zone include bluejoint (*Calamagrostis canadensis*), little bluet (*Houstonia caerulea*), and American false hellebore (*Veratrum viride*); known from ravines of the Presidential Range between 4,400–5,500 ft. in elevation (locally above the ravines in wet snowbank and rill settings)..... **Alpine herbaceous snowbank/rill**
- 63b. Moist alpine tundra community restricted to Mount Washington, dominated by a mix of forbs, sedges, and heath shrubs; generally somewhat drier conditions than the alternate choice, and the diagnostic and wet-site species listed in the alternate choice are absent or rare; differential species (absent in **62a**) may include alpine bistort (*Bistorta vivipara*)*, Boott's rattlesnake-root (*Nabalus boottii*)*, scirpus-like sedge (*Carex scirpoidea*)*, and Scotch bellflower (*Campanula rotundifolia*)..... **Moist alpine herb - heath meadow**
- 64a. *Diapensia (Diapensia lapponica)** is the dominant species (usually >5% cover); found primarily above 4,300 ft. elevation **Diapensia shrubland**
- 64b. Community is dominated by a mix of Bigelow's sedge (*Carex bigelowii*)*, highland rush (*Juncus trifidus*), and dwarf heaths such as alpine blueberry (*Vaccinium uliginosum*) and mountain cranberry (*Vaccinium vitis-idaea*); *diapensia (Diapensia lapponica)** is often present, but is not dominant **65**
- 65a. Bigelow's sedge (*Carex bigelowii*)* dominates to the near exclusion of other vascular plants, although scattered individuals of other species may be present; found primarily in the Presidential Range, although small patches occur on some outlying peaks **Bigelow's sedge meadow**
- 65b. Bigelow's sedge (*Carex bigelowii*)* may be frequent or co-dominant with other species, but is not the sole dominant. **66**
- 66a. Well drained snowbank communities characterized by some combination of the species Labrador tea (*Rhododendron groenlandicum*), dwarf blueberry (*Vaccinium cespitosum*)*, black crowberry (*Empetrum nigrum*), wavy hair grass (*Deschampsia flexuosa*), starflower (*Lysimachia borealis*), *Spinulum annotinum* (common interrupted-clubmoss), bunchberry (*Chamaepericlymenum canadense*), and Canada-mayflower (*Maianthemum canadense*); restricted to Presidential Range and Franconia Ridge from 4,600–5,500 ft. elevation **Alpine heath snowbank**
- 66b. Alpine meadows in which the species listed in the alternate choice are absent or rare; dominant species are Bigelow's sedge (*Carex bigelowii*)*, highland rush (*Juncus trifidus*), alpine blueberry (*Vaccinium uliginosum*), mountain cranberry (*Vaccinium vitis-idaea*), and three-toothed cinquefoil (*Sibbaldiopsis tridentata*); community occurs between 4,800–5,600 ft. in the Presidential Range and as low as 4,600 ft. on Franconia Ridge and Mt. Moosilauke **Sedge - rush - heath meadow**
- 67a. Communities on cliffs (exposed bedrock greater than three meters in height and 65 degrees in slope) **68**
- 67b. Communities not on cliffs..... **71**
- 68a. Cliff communities generally below 2,200 ft. in elevation **69**
- 68b. Cliff communities generally above 2,200 ft. in elevation **70**
- 69a. Cliff has species characteristic of acidic, nutrient-poor conditions; typical species include wavy hair grass (*Deschampsia flexuosa*), marginal wood fern (*Dryopteris marginalis*), rock polypody (*Polypodium virginianum*), Mackay's brittle fern (*Cystopteris tenuis*), and pink-corydalis (*Capnoides sempervirens*)..... **Temperate acidic cliff**

- 69b. Cliff has species characteristic of circumneutral, mineral-enriched conditions; diagnostic species include slender rock-brake (*Cryptogramma stelleri*)*, Meyer's maidenhair spleenwort (*Asplenium trichomanes* ssp. *quadrivalens*), rusty cliff fern (*Woodsia ilvensis*), purple cliff-brake (*Pellaea atropurpurea*)*, and early saxifrage (*Saxifraga virginensis*).....
.....**Temperate circumneutral cliff**
- 70a. Cliff has species characteristic of acidic, mineral-poor conditions; typical species include wavy hair grass (*Deschampsia flexuosa*), three-toothed cinquefoil (*Sibbaldiopsis tridentata*), fragile fern (*Cystopteris fragilis*), *Solidago simplex* ssp. *randii* var. *monticola* (montane Rand's goldenrod), poverty oatgrass (*Danthonia spicata*), and pink-corydalis (*Capnoides sempervirens*).....**Montane - subalpine acidic cliff**
- 70b. Cliff has species characteristic of circumneutral to subacid, mineral-enriched conditions; diagnostic species include fragrant wood fern (*Dryopteris fragrans*)*, smooth cliff fern (*Woodsia glabella*)*, Scotch bellflower (*Campanula rotundifolia*), rusty cliff fern (*Woodsia ilvensis*), slender rock-brake (*Cryptogramma stelleri*)*, northern white cedar (*Thuja occidentalis*), and scirpus-like sedge (*Carex scirpoidea*)*, among several others.....
.....**Montane - subalpine circumneutral cliff**
- 71a. Rocky ridge community with species characteristic of circumneutral bedrock sites; diagnostic species include creeping juniper (*Juniperus horizontalis*)*, white flat-topped-goldenrod (*Oligoneuron album*)*, wild honeysuckle (*Lonicera dioica*), and one-flowered broom-rape (*Orobanche uniflora*).....**Circumneutral rocky ridge**
- 71b. Communities on landslides and talus slopes, not rocky ridges **72**
- 72a. Talus slopes and landslide scars at mid to high elevations in the White Mtns. (mostly above 2,200 ft., occasionally to 1,500 ft.); red spruce (*Picea rubens*), birches (*Betula* spp.), and mountain-ashes (*Sorbus* spp.) in vicinity; oaks (*Quercus* spp.) and black birch (*Betula lenta*) absent..... **73**
- 72b. Talus barrens at low to mid elevations in southern and central NH (below 2,200 ft.); vascular plant cover is very low (generally <5%); substrate consists of boulders and large rocks; lichens are primary vegetation form; red spruce (*Picea rubens*) and mountain-ashes (*Sorbus* spp.) absent or sparse from surrounding communities; oaks (*Quercus* spp.) and black birch (*Betula lenta*) present or in vicinity..... **Temperate lichen talus barren**
- 73a. Community occurs as a linear track down a steep mountain slope where rock, soil, and vegetation have slumped catastrophically and slid down the mountain; remaining substrate consists of bare rock, scree, or talus; vegetative cover can range from sparse on recent slides to wooded on areas that have had a longer recovery period since the last disturbance (landslides often remain prone to regular snow avalanche disturbance)
.....**Montane landslide barren and thicket**
- 73b. Open slopes with large, lichen-covered rocks with little or no soil accumulation and vascular plant cover (generally <5%); this community is typically found below a cliff system, although it can be found in the absence of cliffs which have since wasted away.....**Montane lichen talus barren**

KEY TO WETLAND NATURAL COMMUNITIES

- 1a. Freshwater wetlands not influenced by tidal inundation; halophytic vegetation listed in the alternate choice not present; includes marshes, peatlands, swamps, floodplains, riverbanks, and seeps.

Key to Palustrine Natural Communities

- 1b. Brackish and salt water wetlands subjected to tidal inundation and subtidal habitats; halophytic (salt-loving) vegetation present such as cordgrasses (*Spartina* spp.), widgeon-grass (*Ruppia maritima*), saltmarsh rush (*Juncus gerardii*), saltmarsh arrow-grass (*Triglochin maritima*), sea-coast tuber-bulrush (*Bolboschoenus robustus*), glassworts (*Salicornia* spp.), and eelgrass (*Zostera marina*).

Key to Estuarine Natural Communities

KEY TO PALUSTRINE NATURAL COMMUNITIES

- 1a. Communities directly associated with periodic flooding along a river or large stream (third order or higher); forested floodplains and open riverbanks and shores **2**
- 1b. Wetland natural communities not directly associated with a river or large stream (third order or higher); occurs in wet depressions or sloped settings, along pond or lake shores, or along drainages of small streams (i.e., first and second order) **37**
- 2a. Primarily forested habitats above the bankful stage of a river that receive periodic overbank flooding..... **3**
- 2b. Open habitats along rivers and large streams; dominant vegetation is shrubby or herbaceous, but may be sparsely vegetated as well; includes river channels and riverbanks, as well as herbaceous and scrub-shrub marshes along low-gradient portions of rivers and streams **10**
- 3a. Floodplain forests of major rivers in which silver maple (*Acer saccharinum*) is a dominant or co-dominant in the canopy..... **4**
- 3b. Floodplain forests in which silver maple (*Acer saccharinum*) is sparse or absent..... **6**
- 4a. Floodplain forests with a canopy comprised of sugar maple (*Acer saccharum*), silver maple (*Acer saccharinum*), and white ash (*Fraxinus americana*); along rivers mostly in central and northern NH with flashy, high-energy flood regimes **Sugar maple - silver maple - white ash floodplain forest**
- 4b. Floodplain forests dominated by silver maple (*Acer saccharinum*); generally without sugar maple (*Acer saccharum*); along rivers mostly in central and southern NH with low to moderate-energy flood regimes..... **5**
- 5a. Silver maple (*Acer saccharinum*) dominated forest with a lush herb layer characterized by ostrich fern (*Matteuccia struthiopteris* ssp. *pensylvanica*) and wood nettle (*Laportea canadensis*); much lower graminoid cover than the alternate choice; soils are generally silt loams or very fine sandy loams..... **Silver maple - wood nettle - ostrich fern floodplain forest**
- 5b. Silver maple (*Acer saccharinum*) dominated forest; characteristic herbs are sensitive fern (*Onoclea sensibilis*) and small-spiked false nettle (*Boehmeria cylindrica*); wood nettle (*Laportea canadensis*) is usually absent; graminoids are frequent, including sweet wood-reed (*Cinna arundinacea*), slender wood-reed (*Cinna latifolia*), and fringed sedge (*Carex crinita*); typically with sandier and more acidic soils than the alternate choice **Silver maple - false nettle - sensitive fern floodplain forest**
- 6a. Balsam fir (*Abies balsamea*) is dominant in the canopy or co-dominant with red maple (*Acer rubrum*), black cherry (*Prunus serotina*), and white pine (*Pinus strobus*); occurs in northern and (occasionally) central NH **Balsam fir floodplain/silt plain**
- 6b. Balsam fir (*Abies balsamea*) is absent or rare..... **7**
- 7a. Floodplain forests dominated or co-dominated by swamp white oak (*Quercus bicolor*); green ash (*Fraxinus pennsylvanica*), when present, is diagnostic; only occurs within 30 miles of the coast at less than 150 ft. elevation **Swamp white oak floodplain forest**
- 7b. Swamp white oak (*Quercus bicolor*) is absent or rare **8**
- 8a. Forest has a sparse to moderately well developed canopy dominated by sycamore (*Platanus occidentalis*) and a tall, well developed American hornbeam (*Carpinus caroliniana* ssp. *virginiana*) shrub layer; only known from southwestern NH and a single location near the seacoast..... **Sycamore floodplain forest**
- 8b. Sycamore (*Platanus occidentalis*) is absent or rare..... **9**
- 9a. Forest dominated by sugar maple (*Acer saccharum*) and red oak (*Quercus rubra*); ironwood (*Ostrya virginiana*) is characteristic in the subcanopy **Sugar maple - ironwood - short husk floodplain forest**
- 9b. Floodplain forest dominated by red maple (*Acer rubrum*); frequent shrubs include common winterberry (*Ilex verticillata*), *Viburnum* spp., and highbush blueberry (*Vaccinium corymbosum*); sugar maple (*Acer saccharum*) and ironwood (*Ostrya virginiana*) are generally absent or sparse in this community. **Red maple floodplain forest**

10a. Communities characterized by shrub species; may be tall shrubs such as speckled alder (<i>Alnus incana</i> ssp. <i>rugosa</i>) and buttonbush (<i>Cephalanthus occidentalis</i>), medium-height shrubs such as meadowsweet (<i>Spiraea alba</i> var. <i>latifolia</i>), or low-growing shrubs such as eastern dwarf cherry (<i>Prunus pumila</i> var. <i>depressa</i>) and hairy hudsonia (<i>Hudsonia tomentosa</i>)*.....	11
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12b. Moderate energy river channel community characterized by the presence of hairy hudsonia (<i>Hudsonia tomentosa</i>)* and silverling (<i>Paronychia argyrocoma</i>)*; known only from the upper Saco River.....	Hudsonia - silverling river channel
13a. Community dominated by buttonbush (<i>Cephalanthus occidentalis</i>) in oxbow settings that are flooded for all or most of the growing season.....	Buttonbush shrubland
13b. Buttonbush (<i>Cephalanthus occidentalis</i>) sparse or absent.....	14
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18b. Alluvial shrubland on moderate-gradient rivers; thickets of tree saplings and tall shrubs are interspersed with sizable patches of bare substrate; characteristic species include meadowsweet (<i>Spiraea alba</i> var. <i>latifolia</i>), willows (<i>Salix</i> spp.), dogwoods (<i>Swida</i> spp.), alders (<i>Alnus</i> spp.), and birches (<i>Betula</i> spp.) and other tree saplings.....	Mixed alluvial shrubland

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- 85a. Community is characterized by significant cover (5–40+%) of tall shrubs, which may include highbush blueberry (*Vaccinium corymbosum*), common winterberry (*Ilex verticillata*), mountain holly (*Ilex mucronata*), speckled alder (*Alnus incana* ssp. *rugosa*), maleberry (*Lyonia ligustrina*), and sweet pepperbush (*Clethra alnifolia*) **86**
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- 87a. Speckled alder (*Alnus incana* ssp. *rugosa*) is one of the dominant shrubs above a robust herb layer (25–90% cover) that includes lake sedge (*Carex lacustris*); low cover of trees (<25%); medium shrubs such as leatherleaf (*Chamaedaphne calyculata*) and sweet gale (*Myrica gale*) are usually abundant (5–50% cover); other frequent herbs include skunk-cabbage (*Symplocarpus foetidus*) and royal fern (*Osmunda regalis* var. *spectabilis*) **Alder - lake sedge intermediate fen**

- 87b. Tall shrub layer may include speckled alder (*Alnus incana* ssp. *rugosa*), but lake sedge (*Carex lacustris*) and skunk-cabbage (*Symplocarpus foetidus*) are usually absent **88**
- 88a. Tall shrub swamp dominated by speckled alder (*Alnus incana* ssp. *rugosa*), with other shrubs including mountain holly (*Ilex mucronata*) and withe-rod (*Viburnum nudum* var. *cassinoides*); more minerotrophic indicator species are present, and heath shrubs such as leatherleaf (*Chamaedaphne calyculata*) and sheep laurel (*Kalmia angustifolia*) are uncommon or absent **Alder wooded fen**
- 88b. Tall shrub swamps with highbush blueberry (*Vaccinium corymbosum*), common winterberry (*Ilex verticillata*), or mountain holly (*Ilex mucronata*); sweet pepperbush (*Clethra alnifolia*) may be subdominant in examples near the coast; heath shrubs such as leatherleaf (*Chamaedaphne calyculata*) and sheep laurel (*Kalmia angustifolia*) are common **89**
- 89a. Tall shrub swamp dominated by mountain holly (*Ilex mucronata*) and withe-rod (*Viburnum nudum* var. *cassinoides*); typically a sparse canopy of black spruce (*Picea mariana*) and/or American larch (*Larix laricina*); restricted to northern NH; southern species such as highbush blueberry (*Vaccinium corymbosum*), sweet pepperbush (*Clethra alnifolia*), and maleberry (*Lyonia ligustrina*) are sparse or absent **Mountain holly - black spruce wooded fen**
- 89b. Tall shrubs swamps with highbush blueberry (*Vaccinium corymbosum*) common **90**
- 90a. Tall shrubs such as highbush blueberry (*Vaccinium corymbosum*) and maleberry (*Lyonia ligustrina*) have sparse to medium cover; sweet pepperbush (*Clethra alnifolia*) may be present; sweet gale (*Myrica gale*) and meadowsweet (*Spiraea alba* var. *latifolia*) are diagnostic; typically found along upland borders and moats of acidic fens and along sluggish stream borders **Highbush blueberry - sweet gale - meadowsweet shrub thicket**
- 90b. Tall shrub swamps dominated by highbush blueberry (*Vaccinium corymbosum*), common winterberry (*Ilex verticillata*), or mountain holly (*Ilex mucronata*); sweet gale (*Myrica gale*) and meadowsweet (*Spiraea alba* var. *latifolia*) generally in low abundance **91**
- 91a. Tall shrub swamp characterized by common winterberry (*Ilex verticillata*) and highbush blueberry (*Vaccinium corymbosum*); sparse tree cover (1–20%), primarily of red maple (*Acer rubrum*); herb species are indicative of weakly minerotrophic conditions, and include cinnamon fern (*Osmundastrum cinnamomeum*), hoary sedge (*Carex canescens*), and swamp yellow-loosestrife (*Lysimachia terrestris*) **Winterberry - cinnamon fern wooded fen**
- 91b. Tall shrub swamp found on the margins of peatlands and occasionally in basin interiors; highbush blueberry (*Vaccinium corymbosum*) and mountain holly (*Ilex mucronata*) are the characteristic shrubs, which average 15% cover; generally sparse canopy of black spruce (*Picea mariana*) and American larch (*Larix laricina*) is also present, as are the medium-height shrubs leatherleaf (*Chamaedaphne calyculata*) and sheep laurel (*Kalmia angustifolia*) **Highbush blueberry - mountain holly wooded fen**
- 92a. Wet, hummocky community in upland-wetland transition zone of pond margins dominated by minerotrophic *Sphagnum* species, including *S. recurvum*, *S. flexuosum*, and *S. fimbriatum*; water willow (*Decodon verticillatus*) is typically present and other frequent species include leatherleaf (*Chamaedaphne calyculata*), hoary sedge (*Carex canescens*), and sweet gale (*Myrica gale*) **Water willow - Sphagnum fen**
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- 93a. Peatland with sparse, stunted canopy of black spruce (*Picea mariana*) and/or American larch (*Larix laricina*) (generally 1–10% cover); dwarf shrub layer of leatherleaf (*Chamaedaphne calyculata*) is characteristic **Leatherleaf - black spruce bog**
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- 94a. Somewhat minerotrophic community characterized by wire sedge (*Carex lasiocarpa*) and sweet gale (*Myrica gale*); *Sphagnum* moss may be absent, but usually forms a sparse to moderate cover; leatherleaf (*Chamaedaphne calyculata*) may be present, but only at low abundances **Wire sedge - sweet gale fen**
- 94b. Communities dominated by leatherleaf (*Chamaedaphne calyculata*), sweet gale (*Myrica gale*), and/or sheep laurel (*Kalmia angustifolia*); wire sedge (*Carex lasiocarpa*) may be present, but is typically not a dominant as in the alternate choice **95**

- 95a. Peatland dominated by low shrubs, with an absence or very low abundance of tall shrubs and trees; leatherleaf (*Chamaedaphne calyculata*) is the characteristic shrub, with sheep laurel (*Kalmia angustifolia*) also common; *Sphagnum capillifolium* is diagnostic and typically occupies hummocks; sweet gale (*Myrica gale*) and tall sedges such as tussock sedge (*Carex stricta*) and swollen-beaked sedge (*Carex utriculata*) generally sparse or absent..... **Leatherleaf - sheep laurel shrub bog**
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- 96b. Fen characterized by a mixture of dwarf shrub species (average 1.5 ft. tall) including sweet gale (*Myrica gale*), bog rosemary (*Andromeda polifolia* var. *glaucophylla*), bog laurel (*Kalmia polifolia*), leatherleaf (*Chamaedaphne calyculata*), and small cranberry (*Vaccinium oxycoccos*); swollen-beaked sedge (*Carex utriculata*) and few-seeded sedge (*Carex oligosperma*) are frequent; *Sphagnum magellanicum*, *S. fallax*, and *S. angustifolium* are typically abundant..... **Bog rosemary - sedge fen**
- 97a. Small fresh water wetlands occurring in depressions between coastal sand dunes; dominant species vary, but can include large cranberry (*Vaccinium macrocarpon*) and/or Baltic rush (*Juncus balticus* ssp. *littoralis*); other possible plants include purple chokeberry (*Aronia floribunda*), common winterberry (*Ilex verticillata*), poison-ivy (*Toxicodendron radicans*), and Virginia marsh-St. John's-wort (*Triadenum virginicum*) **Coastal interdunal marsh/swale**
- 97b. Wetlands of drainage marshes, sand plain basins, and sandy pond shores; not found in coastal dunes **98**
- 98a. Oligotrophic wetlands along sandy lake and pond shores and in closed basins with no inlets or outlets and widely fluctuating water levels; diagnostic communities are dominated by herbs; characteristic species include meadow beauty (*Rhexia virginica*), twig-rush (*Cladium mariscoides*), lance-leaved violet (*Viola lanceolata*), and bulblet umbrella sedge (*Cyperus dentatus*) **99**
- 98b. Minerotrophic wetlands not specifically associated with sand plain settings; vegetation may be herbaceous or shrubland **111**
- 99a. Wetlands on sandy shores of permanent ponds or lakes that experience pronounced wave action and ice scour; diagnostic species include twig-rush (*Cladium mariscoides*) and common grass-leaved-goldenrod (*Euthamia graminifolia*), with water lobelia (*Lobelia dortmanna*) frequent in the aquatic zone; includes the **hudsonia inland beach strand** community, which is an upland type **100**
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- 100a. Community occurs on sand or gravel shores of ponds in the mountains and northern NH, rather than sand plain settings; characteristic species include appressed bog-clubmoss (*Lycopodiella appressa*)*, Pickering's reed grass (*Calamagrostis pickeringii*), round-leaved sundew (*Drosera rotundifolia*), and lake shore sedge (*Carex lenticularis*) **Montane sandy pond shore**
- 100b. Community occurs on shores of lakes and large ponds in sand plain settings **101**
- 101a. Community occurs on lake shore sand berms several feet above summer water level, characterized by dry site species including hairy hudsonia (*Hudsonia tomentosa*)*, golden heather (*Hudsonia ericoides*)*, and little bluestem (*Schizachyrium scoparium*); known only from Ossipee Lake **Hudsonia inland beach strand**
- 101b. Community is a wetland, characterized by wetland herbaceous and shrub species **102**
- 102a. Community is characterized by the presence of medium-height and tall shrubs adjacent to upland edges **Sweet gale - alder shrub thicket**
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- 103a. Community is semi-permanently to permanently inundated; characterized by bayonet rush (*Juncus militaris*) and/or a combination of aquatic rosette and floating and submersed species **104**
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- 104a. Community dominated by bayonet rush (*Juncus militaris*); three-square bulrush (*Schoenoplectus pungens*) is a common associate **Bayonet rush emergent marsh**
- 104b. Community is permanently inundated or intermittently exposed; characterized by aquatic rosette and floating and submersed species such as water lobelia (*Lobelia dortmanna*), seven-angled pipewort (*Eriocaulon aquaticum*), quillworts (*Isoetes* spp.), ribbon-leaved pondweed (*Potamogeton epihydrus*), and floating pondweed (*Potamogeton natans*) **Water lobelia aquatic sandy pond shore**
- 105a. Community occurs on sandy organic turf, higher on the shore than the alternate choice; twig-rush (*Cladium mariscoides*) is the dominant species; other characteristic species include common grass-leaved-goldenrod (*Euthamia graminifolia*), coastal plain grass-leaved-goldenrod (*Euthamia caroliniana*)*, tussock sedge (*Carex stricta*), and wire sedge (*Carex lasiocarpa*) **Twig-rush sandy turf pond shore**
- 105b. Community occurs on sandy shores with little or no organic matter accumulation; lower on the shore and with greater wave and ice disturbance than the alternate choice; characteristic species are bulblet umbrella sedge (*Cyperus dentatus*), lance-leaved violet (*Viola lanceolata*), brown-fruited rush (*Juncus pelocarpus*), and Devil's beggar-ticks (*Bidens frondosa*) **Bulblet umbrella sedge open sandy pond shore**
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- 107a. Semi-permanently flooded to intermittently exposed shallow peat swales dominated by the floating-stemmed sharp-flowered mannagrass (*Glyceria acutiflora*)*; *Sphagnum* spp. vary from low abundance to co-dominant; only known from a single site in southern NH **Sharp-flowered mannagrass shallow peat marsh**
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- 108a. Marsh dominated by short rhizomatous sedges, forbs, short clumped graminoids, and an abundance of *Sphagnum cuspidatum*; dominant species include slender spikesedge (*Eleocharis tenuis*), meadow beauty (*Rhexia virginica*), and rattlesnake mannagrass (*Glyceria canadensis*); only known from a single site in the lower Merrimack River valley **Meadow beauty sand plain marsh**
- 108b. Sand plain marsh dominated by robust perennial graminoids, medium shrubs, and *Sphagnum* mosses; characteristic species include meadowsweet (*Spiraea alba* var. *latifolia*), three-way sedge (*Dulichium arundinaceum*), tussock sedge (*Carex stricta*), wire sedge (*Carex lasiocarpa*), and swollen-beaked sedge (*Carex utriculata*) **Meadowsweet - robust graminoid sand plain marsh**
- 109a. Highly variable closed basins in inland, montane settings; southern and coastal plain species found in other sandy basin marshes generally absent; common species include royal fern (*Osmunda regalis* var. *spectabilis*), Canada rush (*Juncus canadensis*), northern mannagrass (*Glyceria borealis*), and water bulrush (*Schoenoplectus subterminalis*) **Montane sandy basin marsh**
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- 110b. Moderately to densely vegetated “mudflat” community dominated by short rhizomatous graminoids and forbs and mudflat annuals; generally in wetter settings and with a greater abundance of floating and/or submersed aquatics than the alternate choice; typical species include yellow spikesedge (*Eleocharis flavescens* var. *olivacea*), common spikesedge (*Eleocharis palustris*), needle spikesedge (*Eleocharis acicularis*), brown-fruited rush (*Juncus pelocarpus*), and Smith's bulrush (*Schoenoplectus smithii*) **Spikesedge - floating-leaved aquatic mudflat marsh**

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- 114a. Herbaceous seepage marsh dominated by lake sedge (*Carex lacustris*).....**Lake sedge seepage marsh**
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- 115a. Community characterized by short (<2 ft. tall) herbaceous vegetation under seasonally flooded or intermittently exposed situations, such as mud-flats of recently drawn-down beaver ponds or exposed soil along wet river shores; often has large areas of unvegetated mud; common species include yellow-seeded false pimpernel (*Lindernia dubia*), golden hedge-hyssop (*Gratiola aurea*), beggar-ticks (*Bidens* spp.), and common spikeseed (*Eleocharis palustris*) **Short graminoid - forb meadow marsh/mudflat**
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- 116a. Wetland dominated by graminoids on a grounded peat mat; characteristic species include swollen-beaked sedge (*Carex utriculata*), three-way sedge (*Dulichium arundinaceum*), bluejoint (*Calamagrostis canadensis*), and hoary sedge (*Carex canescens*); transitional between marsh communities on mineral soils and open peatlands **Sedge meadow marsh**
- 116b. Marsh characterized by tall graminoids on mineral soils; typical species include bluejoint (*Calamagrostis canadensis*), white cut grass (*Leersia virginica*), rice cut grass (*Leersia oryzoides*), three-way sedge (*Dulichium arundinaceum*), tussock sedge (*Carex stricta*), woolly bulrush (*Scirpus cyperinus*), and blue iris (*Iris versicolor*)..... **Tall graminoid meadow marsh**
- 117a. Medium-depth marsh dominated almost exclusively by broad-leaved cattail (*Typha latifolia*) and/or narrow-leaved cattail (*Typha angustifolia*) **Cattail marsh**
- 117b. Medium-depth or deep water marshes not dominated by broad-leaved cattail (*Typha latifolia*) and/or narrow-leaved cattail (*Typha angustifolia*); cattails may be present, but not as in the alternate choice..... **118**
- 118a. Medium-depth marsh dominated by bayonet rush (*Juncus militaris*); three-square bulrush (*Schoenoplectus pungens*) is a common associate **Bayonet rush emergent marsh**
- 118b. Medium-depth or deep water marshes not dominated by bayonet rush (*Juncus militaris*) **119**
- 119a. Usually semi-permanently flooded substrates, inundated by shallow to deep water for most or all of the growing season; vegetation is a mix of emergent graminoids, spongy-tissue species, and some floating-leaved and submersed plants such as American bur-reed (*Sparganium americanum*), common arrowhead (*Sagittaria latifolia*), pickerelweed (*Pontederia cordata*), spikeseeds (*Eleocharis* spp.), soft-stemmed bulrush (*Schoenoplectus tabernaemontani*), bullhead pond-lily (*Nuphar variegata*), and white water-lily (*Nymphaea odorata*)..... **Emergent marsh**
- 119b. Permanently flooded community with water depths generally at least 2 ft.; floating-leaved aquatic species are dominant, and include white water-lily (*Nymphaea odorata*), bullhead pond-lily (*Nuphar variegata*), water-shield (*Brasenia schreberi*), little floating-heart (*Nymphoides cordata*), and pondweeds (*Potamogeton* spp.)..... **Aquatic bed**

- 120a. Tall shrub swamp in depressions or on slopes fed by groundwater seepage; speckled alder (*Alnus incana* ssp. *rugosa*) is the dominant shrub; diverse herb layer includes marsh-marigold (*Caltha palustris*), golden-saxifrage (*Chrysosplenium americanum*), and spotted touch-me-not (*Impatiens capensis*)..... **Alder seepage thicket**
- 120b. Shrub swamps in basins or along drainages; not characterized by groundwater seepage **121**
- 121a. Basin swamp with moderate to dense cover of buttonbush (*Cephalanthus occidentalis*); standing water is present for most or all of growing season **Buttonbush shrubland**
- 121b. Shrub communities with highbush blueberry (*Vaccinium corymbosum*) and/or common winterberry (*Ilex verticillata*) as dominants or co-dominants; buttonbush (*Cephalanthus occidentalis*) may be present, but is never dominant **122**
- 122a. Open wetland with a mix of tall shrubs and marsh species; tall shrubs typically include highbush blueberry (*Vaccinium corymbosum*), common winterberry (*Ilex verticillata*), speckled alder (*Alnus incana* ssp. *rugosa*), and withe-rod (*Viburnum nudum* var. *cassinoides*); common herbs include bluejoint (*Calamagrostis canadensis*), tussock sedge (*Carex stricta*), and cinnamon fern (*Osmundastrum cinnamomeum*)..... **Mixed tall graminoid - scrub-shrub marsh**
- 122b. Shrubland dominated by highbush blueberry (*Vaccinium corymbosum*) and common winterberry (*Ilex verticillata*); scattered red maple (*Acer rubrum*) are often present; herbs are generally scarce, but may include cinnamon fern (*Osmundastrum cinnamomeum*), royal fern (*Osmunda regalis* var. *spectabilis*), and marsh fern (*Thelypteris palustris* var. *pubescens*)..... **Highbush blueberry - winterberry shrub thicket**

KEY TO ESTUARINE NATURAL COMMUNITIES

1a. Permanently-flooded subtidal areas that support stands of eelgrass (*Zostera marina*) **Eelgrass bed**

1b. Communities in intertidal areas; not permanently flooded **2**

2a. Tidal marshes dominated by vascular plants; grasses and/or sedges form a dense cover; includes pannes and pools embedded within tidal marshes which may be sparsely vegetated..... **3**

2b. Intertidal areas with sparse vascular vegetation that occur between tidal marshes or uplands landward and subtidal communities seaward; includes intertidal shores along rivers, coastal shoreline strands on mineral sediments, intertidal rocky shores, and intertidal mudflats on nearly flat extents of sand, mud, and silt..... **13**

3a. Tidal marsh communities that are moderately to strongly saline (18–50 ppt); smooth cordgrass (*Spartina alterniflora*) and/or saltmeadow cordgrass (*Spartina patens*) are typically strongly dominant; brackish indicators, if present, restricted to upland margins or fresh water input areas..... **4**

3b. Tidal marsh communities with lower salinity levels (0.5–18 ppt) that receive inputs of fresh water from the watershed above; brackish indicators such as sea-coast tuber-bulrush (*Bolboschoenus robustus*) and narrow-leaved cattail (*Typha angustifolia*) are dominant species along with a variable mix of other graminoids and forbs; rare indicators include Atlantic mudwort (*Limosella australis*)*, eastern grasswort (*Lilaeopsis chinensis*)*, and seaside brookweed (*Samolus valerandi* ssp. *parviflorus*)*; includes **brackish water pools** found on the Isles of Shoals **7**

4a. Tidal shrubland community dominated by the shrub marsh elder (*Iva frutescens*)* along the upper margin of tidal marshes **Marsh elder shrubland**

4b. Tidal marshes without well-developed bands of marsh elder (*Iva frutescens*)* or other woody species; if marsh elder is present, cover is sparse..... **5**

5a. High marsh between mean high tide and upland edge; saltmeadow cordgrass (*Spartina patens*) is the characteristic species; other plants include smooth cordgrass (*Spartina alterniflora*), saltgrass (*Distichlis spicata*), and saltmarsh rush (*Juncus gerardii*)..... **High salt marsh**

5b. Marshes below mean high tide or pannes and pools on the high marsh above high tide but more often inundated than the surrounding marsh; saltmeadow cordgrass (*Spartina patens*) may be present, but does not form extensive meadows **6**

6a. Low marshes dominated by smooth cordgrass (*Spartina alterniflora*) between mean sea level and mean high tide **Low salt marsh**

6b. Pannes and pools forming in depressions isolated from tidal creeks; species composition varies with salinity, hardness of substrate, elevation, hydroperiod, and other factors; dominant species, depending on variant, may include saltmarsh arrow-grass (*Triglochin maritima*), smooth cordgrass (*Spartina alterniflora*) (short form), and widgeon-grass (*Ruppia maritima*)..... **Salt pannes and pools**

7a. Community occupies small depressions within **maritime rocky barrens** on the Isles of Shoals; receives fresh water inputs from adjacent uplands and precipitation, salt water from storm-driven overwash; fresh water species include blue iris (*Iris versicolor*) and northern water-horehound (*Lycopus uniflorus*); frequent brackish species include hyssop-leaved loosestrife (*Lythrum hyssopifolia*), coastal silverweed (*Argentina egedii* ssp. *groenlandica*); and sea-coast tuber-bulrush (*Bolboschoenus robustus*) **Brackish water pool**

7b. Brackish marshes on the mainland; not associated with **maritime rocky barrens** **8**

8a. Marsh communities that occupy a basin separated from the ocean by a cobble berm; basin is seasonally flooded with fresh water and periodically infused with salt water during storm events; water is brackish to slightly brackish **9**

8b. Marshes that receive salt water from daily or spring tides; not in the setting of a basin separated from the ocean by a cobble berm..... **11**

9a. Meadow marsh community in which the soil surface is exposed during most of the growing season; dominated by herbs such as New York American-aster (*Symphotrichum novi-belgii*), seaside goldenrod (*Solidago sempervirens*), prairie cordgrass (*Spartina pectinata*), and creeping bentgrass (*Agrostis stolonifera*)..... **Coastal salt pond meadow marsh**

9b. Communities are emergent marshes or flats that are inundated during most of the year; soil surface is only exposed during dry periods or drought..... **10**

- 10a. Emergent marsh community typically dominated by perennial, spongy-tissued (aerenchymatous) species, including narrow-leaved cattail (*Typha angustifolia*), soft-stemmed bulrush (*Schoenoplectus tabernaemontani*), three-square bulrush (*S. pungens*), saltmarsh tuber-bulrush (*Bolboschoenus maritimus* ssp. *paludosus*), and bur-reeds (*Sparganium* spp.)..... **Coastal salt pond emergent marsh**
- 10b. Community occupying lowest elevations in the coastal salt pond basin; typically inundated for the entire growing season, except during periods of drought; vegetation is sparse and characterized by scattered floating-leaved aquatic species such as common duckweed (*Lemna minor*) and species such as little-headed spikeseedge (*Eleocharis parvula*)* and one-glumed spikeseedge (*Eleocharis uniglumis*)* **Coastal salt pond flat**
- 11a. Marshes that usually occur along the upper margins of high salt marshes where fresh water runoff or groundwater discharge flows onto the marsh surface; dominant species, depending on variant, may include chaffy sedge (*Carex paleacea*), sea-coast tuber-bulrush (*Bolboschoenus robustus*), narrow-leaved cattail (*Typha angustifolia*), creeping bentgrass (*Agrostis stolonifera*), seaside goldenrod (*Solidago sempervirens*), and prairie cordgrass (*Spartina pectinata*)..**Brackish marsh**
- 11b. Riverbank marshes that are flooded by seawater pushed in by the tides, which is diluted by fresh water flowing in from the watershed above **12**
- 12a. Low riverbank marshes that typically occur between mean sea level and mean high tide; smooth cordgrass (*Spartina alterniflora*) is the dominant species; as salinity decreases many other species may become more prominent, including sea-coast tuber-bulrush (*Bolboschoenus robustus*), narrow-leaved cattail (*Typha angustifolia*), salt marsh water-hemp (*Amaranthus cannabinus*), and halberd-leaved orache (*Atriplex prostrata*)**Low brackish riverbank marsh**
- 12b. High riverbank marshes that are flooded less than daily between mean high water and the upper reaches of spring tides; composition is diverse and variable, and includes sea-coast tuber-bulrush (*Bolboschoenus robustus*), New York American-aster (*Symphyotrichum novi-belgii*), saltmeadow cordgrass (*Spartina patens*), saltmarsh rush (*Juncus gerardii*), prairie cordgrass (*Spartina pectinata*), and creeping bentgrass (*Agrostis stolonifera*); smooth cordgrass (*Spartina alterniflora*) is generally sparse or absent **High brackish riverbank marsh**
- 13a. Sparsely vegetated community found on fine to coarse soils of protected estuarine shorelines; it is flooded less than daily and includes plant stems and other detritus washed in on high tides; sparse herb cover includes saltmarsh sand-spurry (*Spergularia marina*), common glasswort (*Salicornia depressa*), annual sea-blite (*Suaeda linearis*), Carolina sea-lavender (*Limonium carolinianum*), and seaside alkali grass (*Puccinellia maritima*) **Coastal shoreline strand/swale**
- 13b. Intertidal communities that are flooded daily (less than daily in the upper portion of **intertidal rocky shore**); vascular plants very sparse to absent **14**
- 14a. Intertidal community on bedrock and rocky rubble; vascular plants absent; substrate is often covered by macroalgae including knotted wrack (*Ascophyllum nodosum*) and rockweed (*Fucus vesiculosus*) **Intertidal rocky shore**
- 14b. Intertidal sand and mudflats that occur between low salt or brackish riverbank marshes and subtidal communities; includes portions of tidal creek channels exposed at low tide; brackish flats may support little-headed spikeseedge (*Eleocharis parvula*)* and Atlantic mudwort (*Limosella australis*)*; important habitat for a diverse array of algae, diatoms, mollusks, and arthropods **Intertidal flat**

