

VI. TERRESTRIAL SYSTEM

The terrestrial system consists of upland habitats. These habitats have well-drained soils that are dry to mesic (never hydric), and vegetative cover that is never predominantly hydrophytic, even if the soil surface is occasionally or seasonally flooded or saturated. In other words, this is a broadly defined system that includes everything except aquatic, wetland, and subterranean communities.

A. OPEN UPLANDS

This subsystem includes upland communities with less than 25% canopy cover of trees; the dominant species in these communities are shrubs, herbs, or cryptogamic plants (mosses, lichens, etc.). Three distinctive physiognomic types are included in this subsystem. Grasslands include communities that are dominated by grasses and sedges; they may include scattered shrubs (never more than 50% cover of shrubs), and scattered trees (usually less than one tree per acre, or 3 trees per hectare). Meadows include communities with forbs, grasses, sedges, and shrubs codominant; they may include scattered trees. Shrublands include communities that are dominated by shrubs (more than 50% cover of shrubs); they may include scattered trees.

1. Sand beach: a sparsely vegetated community that occurs on unstable sandy shores of large freshwater lakes, where the shore is formed and continually modified by wave action and wind erosion. Characteristic species include beach-pea (*Lathyrus japonicus* var. *glaber*), sea-rocket (*Cakile edentula* ssp. *lacustris*), silverweed (*Potentilla anserina*), tall wormwood (*Artemisia campestris* ssp. *caudata*), sand dropseed (*Sporobolus cryptandrus*), panic grass (*Panicum* spp.), cyperus (*Cyperus* spp.), beggar-ticks (*Bidens* spp.), and knotweed (*Polygonum* spp.). Sand beaches provide feeding areas for migratory birds, and nesting habitat for shorebirds such as spotted sandpiper (*Actitis macularia*). Characteristic insects are tiger beetles (*Cincindela* spp.). More data on this community are needed.

Distribution: throughout New York State.

Rank: G5 S5

Example: Southwick Beach State Park, Jefferson County.

Source: NHP field surveys.

2. Great Lakes dunes: a community dominated by grasses and shrubs that occurs on active and stabilized sand dunes along the shores of the Great Lakes. The composition and structure of the community is variable depending on stability of the dunes, the amount of sand deposition and erosion, and distance from the lake. Unstable dunes are sparsely vegetated; characteristic species include beachgrass (*Ammophila breviligulata*), tall wormwood (*Artemisia campestris* var. *caudata*), beach-pea (*Lathyrus japonicus* var. *glaber*), red osier dogwood (*Cornus sericea*), silky dogwood (*C. amomum*), sand cherry (*Prunus pumila*), sand-dune willow (*Salix cordata*), and cottonwood (*Populus deltoides*). Vegetation of stable dunes is more dense, and can eventually become forested. Characteristic species of stable dunes include starry Solomon's seal (*Smilacina stellata*), jointweed (*Polygonella articulata*), seaside spurge (*Euphorbia polygonifolia*), common hairgrass (*Deschampsia flexuosa*), poison ivy (*Toxicodendron radicans*), and bitterweet (*Celastrus scandens*). More data on this community are needed.

Distribution: only known from the eastern shore of Lake Ontario, in the Eastern Ontario Plain subzone of the Great Lakes Plain ecozone.

Rank: G3G4 S1S2

Examples: El Dorado Beach, Jefferson County; Lakeview Wildlife Management Area, Jefferson County.

Source: Significant Habitat Unit files; NHP field surveys.

3. Maritime beach: a sparsely vegetated community that occurs on unstable sand, gravel, or cobble ocean shores above mean high tide, where the shore is modified by storm waves and wind erosion. Characteristic species include beachgrass (*Ammophila breviligulata*), sea-rocket (*Cakile edentula* ssp. *edentula*), seaside atriplex (*Atriplex patula*), seabeach atriplex (*A. arenaria*), seabeach sandwort (*Honkenya peploides*), salsola (*Salsola kali*), seaside spurge (*Charaesyce polygonifolia*), and seabeach knotweed (*Polygonum glaucum*). This community is an important nesting ground for birds such as piping plover (*Charadrius melodus*), least tern (*Sterna antillarum*), common tern (*S. hirundo*), and roseate tern (*S. dougallii*).

Distribution: along the seacoast of the Coastal Lowlands ecozone.

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Rank: G5 S5

Examples: Fire Island National Seashore, Suffolk County; Napeague Beach, Suffolk County.

Sources: Art 1976; Johnson 1985; Significant Habitat Unit files.

4. Maritime dunes: a community dominated by grasses and low shrubs that occurs on active and stabilized dunes along the Atlantic coast. This community consists of a mosaic of vegetation patches. This mosaic reflects past disturbances such as sand deposition, erosion, and dune migration. The composition and structure of the vegetation is variable depending on stability of the dunes, amounts of sand deposition and erosion, and distance from the ocean. Characteristic species of the active dunes, where sand movement is greatest, include beachgrass (*Ammophila breviligulata*), dusty-miller (*Artemisia stelleriana*), beach pea (*Lathyrus japonicus*), sedge (*Carex silicea*), seaside goldenrod (*Solidago sempervirens*), and sand-rose (*Rosa rugosa*). Characteristic species of stabilized dunes include beach heather (*Hudsonia tomentosa*), bearberry (*Arctostaphylos uva-ursi*), beachgrass (*Ammophila breviligulata*), cyperus (*Cyperus polystachyos* var. *macrostachyus*), seaside goldenrod (*Solidago sempervirens*), beach pinweed (*Lechea maritima*), jointweed (*Polygonella articulata*), sand-rose (*Rosa rugosa*), bayberry (*Myrica pensylvanica*), beach-plum (*Prunus maritima*), poison ivy (*Toxicodendron radicans*), and the lichens *Cladina submitis* and *Cetraria arenaria*. A few stunted pitch pines (*Pinus rigida*) or post oaks (*Quercus stellata*) may be present in the dunes. Characteristic birds are gadwall (*Anas strepera*) and short-eared owl (*Asio flammeus*).

Distribution: along the seacoast of the Coastal Lowlands ecozone.

Rank: G4 S3

Examples: Napeague Dunes, Suffolk County; Fire Island National Seashore, Suffolk County.

Sources: Andrie and Carroll 1988; Art 1976; Johnson 1985; Robichaud and Buell 1983; Zaremba 1989.

5. Maritime shrubland: a shrubland community that occurs on dry seaside bluffs and headlands that are exposed to offshore winds and salt spray.

This is usually a low diversity community dominated by one or more species of shrubs or stunted trees. Characteristic species include beach-plum (*Prunus maritima*), sand-rose (*Rosa rugosa*), wild rose (*R. virginiana*), bayberry (*Myrica pensylvanica*), eastern red cedar (*Juniperus virginiana*), shining sumac (*Rhus copallinum*), poison ivy (*Toxicodendron radicans*), black cherry (*Prunus serotina*), highbush blueberry (*Vaccinium corymbosum*), American holly (*Ilex opaca*), and shadbush (*Amelanchier canadensis*). Characteristic birds include great egret (*Casmerodius albus*) and black-crowned night-heron (*Nycticorax nycticorax*).

Distribution: along the seacoast of the Coastal Lowlands ecozone.

Rank: G4 S4

Example: Fire Island, Suffolk County.

Sources: Clark 1986b; Robichaud and Buell 1983; Taylor 1923.

6. Maritime heathland: a dwarf shrubland community that occurs on rolling outwash plains and moraine of the glaciated portion of the Atlantic coastal plain, near the ocean and within the influence of offshore winds and salt spray. This community is dominated by low heath or heath-like shrubs that collectively have greater than 50% cover. Characteristic shrubs include bearberry (*Arctostaphylos uva-ursi*), beach heather (*Hudsonia tomentosa*), blueberry (*Vaccinium angustifolium*), black huckle-berry (*Gaylussacia baccata*), bayberry (*Myrica pensylvanica*), and beach-plum (*Prunus maritima*). Grasses and forbs are present, but they do not form a turf; characteristic species include common hairgrass (*Deschampsia flexuosa*), little bluestem (*Schizachyrium scoparium*), Pennsylvania sedge (*Carex pensylvanica*), rush (*Juncus greenii*), asters (*Aster dumosum*, *A. linariifolius*, *A. solidagineus*), bushy rockrose (*Helianthemum dumosum*), and New England blazing star (*Liatris scariosa* var. *novae-angliae*). A characteristic bird in winter is yellow-rumped warbler (*Dendroica coronata*). This community intergrades with maritime grassland, and the two communities may occur together in a mosaic.

Distribution: along the seacoast of the Coastal Lowlands ecozone, in eastern Long Island.

Rank: G3 S1

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Example: Montauk Mountain, Suffolk County.

Sources: Zaremba 1989; NHP field surveys.

7. Maritime grassland: a grassland community that occurs on rolling outwash plains of the glaciated portion of the Atlantic coastal plain, near the ocean and within the influence of offshore winds and salt spray. This community is dominated by grasses that usually form a turf; the grasses collectively have greater than 50% cover. Low heath shrubs may be present, with less than 50% cover. The dominant grasses are little bluestem (*Schizachyrium scoparium*), common hairgrass (*Deschampsia flexuosa*), and poverty-grass (*Danthonia spicata*). Other characteristic species include Pennsylvania sedge (*Carex pensylvanica*), rush (*Juncus greenei*), Indian grass (*Sorghastrum nutans*), Atlantic golden aster (*Pityopsis falcata*), bushy rockrose (*Helianthemum dumosum*), hoary frostweed (*H. propinquum*), flat-top goldenrod (*Euthamia graminifolia*), white-topped aster (*Aster paternus*), pussy's-toes (*Antennaria plantaginifolia*), bitter milkwort (*Polygala polygama*), bayberry (*Myrica pensylvanica*), shining sumac (*Rhus copallinum*), and northern dewberry (*Rubus flagellaris*). A characteristic lichen is *Cladina rangiferina*.

Distribution: along the seacoast of the Coastal Lowlands ecozone, in eastern Long Island.

Rank: G2G3 S1

Example: Conscience Point, Suffolk County; Shinnecock Hills, Suffolk County.

Source: Taylor 1923; NHP field surveys.

8. Hempstead Plains grassland: a tall grassland community that occurs on rolling outwash plains in west-central Long Island. This community occurs inland, beyond the influence of offshore winds and salt spray. Historically this community covered approximately 38,000 acres (about 15,000 hectares) of western Long Island; less than 30 acres remain today, and most of these are severely degraded. This community was dominated by species characteristic of midwestern tallgrass prairie: big bluestem (*Andropogon gerardii*), little bluestem (*Schizachyrium scoparium*), Indian grass (*Sorghastrum nutans*), and switchgrass (*Panicum virgatum*). These species are present in today's remnants, but they are not always dominant. Other characteristic

species that still occur in this community include rush (*Juncus greenei*), wild indigo (*Baptisia tinctoria*), dwarf cinquefoil (*Potentilla canadensis*), rough goldenrod (*Solidago nemoralis*), early goldenrod (*Solidago juncea*), butterfly-weed (*Asclepias tuberosa*), stargrass (*Hypoxis hirsuta*), fringed violet (*Viola fimbriatula*), bird's-foot violet (*V. pedata*), stiff-leaf aster (*Aster linariifolius*), boneset (*Eupatorium hyssopifolium*), and northern dewberry (*Rubus flagellaris*). Characteristic birds include vesper sparrow (*Pooecetes gramineus*), savannah sparrow (*Passerculus sandwichensis*), grasshopper sparrow (*Ammodramus savannarum*), and bobolink (*Dolichonyx oryzivorus*).

Distribution: only known from the Coastal Lowlands ecozone, in western Long Island.

Rank: G1Q S1

Sources: Cain et al. 1937; Seyfert 1973; NHP field surveys.

9. Riverside ice meadow: a meadow community that occurs on gently sloping cobble shores and rock outcrops along large rivers in areas where winter ice floes are pushed up onto the shore, forming an ice pack that remains until late spring. The ice scours the meadow, cutting back woody plants. The late-melting ice pack, which is up to 8 ft (2.4 m) deep in late April or early May (in the southern Adirondacks), creates a cool microclimate in late spring, and shortens the growing season. The ice pack deposits organic matter that has accumulated in the ice during the winter, apparently enriching the sandy soils of the cobble and rocky shores. Within this community there is a gradient of two to three vegetation zones that vary with elevation above the river and soil moisture. Along the river there is often a narrow zone of seepy, wet meadow; characteristic species of this riverside seep include sweet-gale (*Myrica gale*), twig-rush (*Cladium mariscoides*), Canadian burnet (*Sanguisorba canadensis*), stiff willow (*Salix rigida*), silky dogwood (*Comus amomum*), three-way sedge (*Dulichium arundinaceum*), slender spikerush (*Eleocharis elliptica*), beakrush (*Rhynchospora capitellata*), cranberry (*Vaccinium macrocarpon*), brook lobelia (*Lobelia kalmii*), and rose pogonia (*Pogonia ophioglossoides*). Where the cobble shores are broad and the soil is coarse and dry, there is a zone of grassy meadow. The dominant grasses include big bluestem (*Andropogon gerardii*), little bluestem (*Schizachyrium scoparium*), and Indian grass (*Sorghastrum nutans*); in at least one

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location, nutrush (*Scleria triglomerata*) is codominant. Characteristic species of the dry meadow include sweet-fern (*Comptonia peregrina*), woodland sunflower (*Helianthus divaricatus*), meadow-sweet (*Spiraea latifolia*), sand-cherry (*Prunus pumila*), butterfly-weed (*Asclepias tuberosa*), wild rose (*Rosa virginiana*), frostweed (*Helianthemum canadense*), and bush-clover (*Lespedeza capitata*). Farthest from the river there may be a shrubby zone that includes some tree saplings and seedlings. Characteristic species of the shrubby zone include hazelnut (*Corylus americana*), virgin's-bower (*Clematis virginiana*), bush honeysuckle (*Diervilla lonicera*), ostrich fern (*Matteuccia struthiopteris*), interrupted fern (*Osmunda claytoniana*), red raspberry (*Rubus idaeus*), deer-tongue grass (*Panicum clandestinum*), and flat-top white aster (*Aster umbellatus*). Data on characteristic animals are needed.

Distribution: along upper reaches of large rivers, reported from the Hudson River in the Adirondacks ecozone, Delaware River in the Appalachian Plateau ecozone, and St. Regis River in the St. Lawrence Plains subzone.

Rank: G2G3 S1

Example: South of The Glen, Warren County.

Source: NHP field surveys.

10. Riverside sand/gravel bar: a meadow community that occurs on sand and gravel bars deposited within a river channel. The community may be very sparsely vegetated, depending on the rates of deposition and erosion of the sand or gravel. Characteristic species include sandbar willow (*Salix exigua*), sand-cherry (*Prunus pumila*), dogbane (*Apocynum cannabinum*), switchgrass (*Panicum virgatum*), and poison ivy (*Toxicodendron radicans*). More data on this community are needed.

Distribution: throughout New York State.

Rank: G5 S5

Sources: NHP field surveys.

11. Shoreline outcrop: a community that occurs along the shores of lakes and streams on outcrops of non-calcareous rocks such as anorthosite, granite, quartzite, sandstone, gneiss, or schist.

The shoreline is exposed to wave action and ice scour. The vegetation is sparse; most plants are rooted in rock crevices. Characteristic species include blueberries (*Vaccinium angustifolium*, *V. pallidum*), black huckleberry (*Gaylussacia baccata*), poverty-grass (*Danthonia spicata*), and common hairgrass (*Deschampsia flexuosa*). Crustose and foliose lichens may be common on the rocks. More data on this community are needed.

Distribution: throughout upstate New York, north of the Coastal Lowlands ecozone.

Rank: G5 S5

Source: NHP field surveys.

12. Calcareous shoreline outcrop: a community that occurs along the shores of lakes and streams on outcrops of calcareous rocks such as limestone and dolomite. The vegetation is sparse, most plants are rooted in rock crevices. Mosses and lichens may be common on the rocks. Characteristic species include wild columbine (*Aquilegia canadensis*), sedges (*Carex eburnea*, *C. granularis*), silky dogwood (*Cornus amomum*), red osier dogwood (*Cornus sericea*), and meadow-rue (*Thalictrum* spp.). Characteristic mosses include *Tortella tortuosa* and *Tortula ruralis*. More data on this community are needed.

Distribution: throughout upstate New York north of the Coastal Lowlands ecozone, at sites where the bedrock is calcareous.

Rank: G3G4 S3?

Examples: El Dorado Beach, Jefferson County; Valcour Island, Clinton.

Source: NHP field surveys.

13. Cobble shore: a community that occurs on the well-drained cobble shores of lakes and streams. These shores are usually associated with high-energy waters (such as high-gradient streams), and they are likely to be scoured by floods or winter ice floes. This community includes both active and stable shores. Active cobble shores have loose cobbles that are moved by waves or river currents; these shores are sparsely vegetated, and they have comparatively few species. Stable cobble shores have cobbles embedded in sand or peat, usually with vegetation

rooted between the cobbles, and are generally more diverse than active cobble shores. Characteristic species include Indian grass (*Sorghastrum nutans*), big bluestem (*Andropogon gerardii*), dogbane (*Apocynum androsaemifolium*), deer-tongue grass (*Panicum clandestinum*), flat-top goldenrod (*Euthamia graminifolia*), beggarticks (*Bidens frondosa*), silverweed (*Potentilla anserina*), and bluejoint grass (*Calamagrostis canadensis*). More data on this community are needed.

Distribution: throughout upstate New York, north of the Coastal Lowlands ecozone.

Rank: G4G5 S4

Example: Doyles Islands, Delaware County.

Source: NHP field surveys.

14. Alvar grassland: a grassland community that occurs on shallow soils over level outcrops of calcareous bedrock (limestone or dolomite). Apparently alvar grasslands are restricted to areas that are seasonally flooded in spring or after heavy rainfall, as well as seasonally dry by late summer. Alvar grasslands range in size from 2 acres (0.8 ha) to 50 acres (20 ha) or more. This community may include two or three species assemblages that seem to be correlated with soil moisture and soil depth.

Wet alvar grassland areas are closest to the water table, with soils about an inch deep. Codominant species are slender spikerush (*Eleocharis elliptica* var. *elliptica*), balsam groundsel (*Senecio pauperculus*), Crawe's sedge (*Carex crawei*), and the mosses *Bryum cespiticium*, and *Drepanocladus* spp.

Moist alvar grassland areas have slightly deeper soils than the wet alvar areas, and they are apparently somewhat higher above the water table. The dominant species are tufted hairgrass (*Deschampsia cespitosa*) and prairie dropseed (*Sporobolus heterolepis*). Other characteristic species include sedges (*Carex crawei*, *C. molesta*, *C. castanea*, *C. vulpinoidea*, *C. granularis*), slender wheatgrass (*Agropyron trachycaulum*), brome grass (*Bromus kalmii*), spike muhly (*Muhlenbergia glomerata*), balsam groundsel (*Senecio pauperculus*), upland white aster (*Solidago ptarmicoides*), golden Alexanders (*Zizia aurea*), white camas (*Zigadenus elegans* ssp. *glauca*), Indian paintbrush (*Castilleja coccinea*), prairie-smoke (*Geum triflorum*), and the mosses *Bryum pseudotriquetrum* and *Ditrichum flexicaule*.

Within the grassland are patches of rock outcrop with a distinctive assemblage of mosses, lichens, and small herbs, much like the rock outcrops in calcareous pavement barrens. These outcrops have dry, very shallow soils (less than an inch deep). Characteristic species of these outcrops include the mosses *Tortella tortuosa* and *Bryum cespiticium*, which form a mat at the borders of the outcrop, and herbs including southern hairgrass (*Agrostis hiemalis*), false pennyroyal (*Trichostema brachiatum*), early saxifrage (*Saxifraga virginensis*), harebell (*Campanula rotundifolia*), small skullcap (*Scutellaria parvula* var. *leonardii*), rock sandwort (*Minuartia michauxii*), thyme-leaf sandwort (*Arenaria serpyllifolia*), rough cinquefoil (*Potentilla norvegica*), and sleepy catch-fly (*Silene antirrhina*).

A characteristic bird is upland sandpiper (*Bartramia longicauda*). More data on characteristic animals are needed.

This community is usually surrounded by, or in a mosaic with calcareous pavement barrens. Patches of the dry grass-savanna assemblage of calcareous pavement barrens may occur within moist alvar grassland. The term "alvar" has been used for similar communities on limestone outcrops in Ontario and Sweden, and on dolomite outcrops in Michigan. In Ontario this community and related communities (such as calcareous pavement barrens) are collectively called "alvar".

Distribution: only known from a few outcrops of Chaumont limestone in Jefferson County, in the Eastern Ontario Plain ecozone.

Rank: G2 S1

Example: Chaumont Barrens, Jefferson County.

Sources: Catling et al. 1975; Reschke and Gilman 1988; Slack et al. 1988; NHP field surveys.

15. Alpine meadow: a meadow community that is similar to arctic tundra. Alpine meadows occur above timberline (about 4900 ft or 1620 m) on the higher mountain summits and exposed ledges of the Adirondacks. This community consists of a mosaic of small grassy meadows, dwarf shrublands, small boggy depressions, and exposed bedrock covered with lichens and mosses. The flora includes arctic-alpine species that are restricted (in New York) to these meadows, as well as boreal species that occur in forests and bogs at lower elevations. The soils are thin and organic, primarily composed of sphagnum peat or black muck. The soils are often saturated

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because they can be recharged by atmospheric moisture. Characteristic species of the grassy meadows include deer's hair sedge (*Scirpus cespitosus*), Bigelow's sedge (*Carex bigelowii*), bluejoint grass (*Calamagrostis canadensis*), alpine sweetgrass (*Hierochloa alpina*), common hairgrass (*Deschampsia flexuosa*), mountain woodrush (*Luzula parviflora*), arctic rush (*Juncus trifidus*), three-toothed cinquefoil (*Potentilla tridentata*), bunchberry (*Comus canadensis*), mountain sandwort (*Minuartia groenlandica*), and dwarf rattlesnake-root (*Prenanthes nana*). Characteristic species of the low shrublands are bog bilberry (*Vaccinium uliginosum*), leatherleaf (*Chamaedaphne calyculata*), Labrador tea (*Ledum groenlandicum*), dwarf birch (*Betula glandulosa*), black crowberry (*Empetrum nigrum*), lapland rosebay (*Rhododendron lapponicum*), diapensia (*Diapensia lapponica*), and bearberry willow (*Salix uva-ursi*). On a few mountains there are distinctive patches of low shrublands consisting of dwarf birches including *Betula glandulosa*, *B. minor*, and stunted *B. cordifolia*. Characteristic species of the small boggy depressions include the peat mosses *Sphagnum nemoreum* and *S. fuscum*, cottongrass (*Eriophorum vaginatum* var. *spissum*), bog laurel (*Kalmia polifolia*), and small cranberry (*Vaccinium oxycoccos*). Rock outcrops that are relatively undisturbed by trampling are covered with arctic-alpine lichens such as map lichen (*Rhizocarpon geographicum*) and may have scattered cushions of diapensia. Characteristic birds include dark-eyed junco (*Junco hyemalis*) and white-throated sparrow (*Zonotrichia albicollis*).

This community is very sensitive to trampling because of the thin, often saturated soils and the very slow growth rate of the vegetation in the stressful alpine environment. Every effort should be made to minimize off-trail trampling by the many hikers who climb to these meadows in the High Peaks.

Distribution: restricted to the Adirondack High Peaks subzone of the Adirondacks ecozone.

Rank: G3G4 S1

Examples: Algonquin Peak, Essex County; Haystack Mountains, Essex County.

Sources: DiNunzio 1972; LeBlanc 1981; NHP field surveys.

16. Cliff community: a community that occurs on vertical exposures of resistant, non-calcareous

bedrock (such as quartzite, sandstone, or schist) or consolidated material; these cliffs often include ledges and small areas of talus. There is minimal soil development, and vegetation is sparse. Different types of cliffs may be distinguished based on exposure and moisture; these variations are not well-documented in New York, therefore the assemblages associated with these variations (sunny, shaded, moist, or dry areas) are combined in one community. Characteristic species include rock polypody (*Polypodium virginianum*), marginal wood fern (*Dryopteris marginalis*), common hairgrass (*Deschampsia flexuosa*), mountain laurel (*Kalmia latifolia*), and hemlock (*Tsuga canadensis*). A characteristic bird that nests on cliffs is the common raven (*Corvus corax*). More data on this community are needed.

Distribution: throughout upstate New York north of the Coastal Lowlands ecozone, where bedrock is not calcareous.

Rank: G5 S4?

Examples: Wallface Mountain, Essex County; Smiley Cliff, Ulster County.

Source: NHP field surveys.

17. Calcareous cliff community: a community that occurs on vertical exposures of resistant, calcareous bedrock (such as limestone or dolomite) or consolidated material; these cliffs often include ledges and small areas of talus. There is minimal soil development, and vegetation is sparse. Different types of calcareous cliffs may be distinguished based on exposure and moisture; these variations are not well-documented in New York, therefore the assemblages associated with these variations (sunny, shaded, moist, or dry areas) are combined in one community. Characteristic species include purple cliff brake (*Pellaea atropurpurea*), bulblet fern (*Cystopteris bulbifera*), early saxifrage (*Saxifraga virginiana*), eastern red cedar (*Juniperus virginiana*), and northern white cedar (*Thuja occidentalis*). More data on this community are needed.

Distribution: throughout upstate New York, north of the Coastal Lowlands ecozone, where bedrock is calcareous.

Rank: G4 S3S4

Examples: Thatcher State Park, Albany County; Tony's Nose, Columbia County.

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Source: NHP field surveys.

18. Shale cliff and talus community: a community that occurs on nearly vertical exposures of shale bedrock and includes ledges and small areas of talus. Talus areas are composed of small fragments that are unstable and steeply sloping; the unstable nature of the shale results in uneven slopes and many rock crevices. There is minimal soil development, and vegetation is sparse. Different types of shale cliffs may be distinguished based on exposure and moisture; these variations are not well-documented in New York, therefore the assemblages associated with these variations (sunny, shaded, moist, or dry areas) are combined in one community. Characteristic species include blunt-lobed woodsia (*Woodsia obtusa*), rusty woodsia (*W. ilvensis*), penstemon (*Penstemon hirsutus*), herb-robert (*Geranium robertianum*), cyperus (*Cyperus filiculmis*), little bluestem (*Schizachyrium scoparium*), panic grass (*Panicum linearifolium*), Pennsylvania sedge (*Carex pennsylvanica*), and eastern red cedar (*Juniperus virginiana*). A characteristic invertebrate is the silvery blue butterfly (*Glaucopsyche lygdamus lygdamus*), which feeds on wood-vetch (*Vicia caroliniana*). More data on this community are needed.

Distribution: scattered throughout upstate New York, north of the Coastal Lowlands ecozone, where bedrock is shale.

Rank: G4 S3?

Examples: Neversink Guymard Cliffs, Orange County; Whetstone Gulf, Lewis County.

Sources: Hotchkiss 1932; NHP field surveys.

19. Rocky summit grassland: a grassland community that occurs on rocky summits and exposed rocky slopes of hills. Characteristic species include little bluestem (*Schizachyrium scoparium*), poverty-grass (*Danthonia spicata*), Indian grass (*Sorghastrum nutans*), ebony spleenwort (*Asplenium platyneuron*), dittany (*Cunila organoides*), and eastern red cedar (*Juniperus virginiana*). More data on this community are needed.

Distribution: not well known; currently reported from the Hudson Valley, Hudson Highlands, Triassic Lowlands ecozones.

Rank: G3G4 S3

Example: Sugarloaf Mountain, Orange County.

Source: NHP field surveys.

20. Successional fern meadow: a meadow dominated by ferns that occurs on sites that have been cleared (for logging, farming, etc.) or otherwise disturbed. Characteristic ferns that may be dominant include bracken fern (*Pteridium aquilinum*) and hay-scented fern (*Dennstaedtia punctilobula*); blueberries (*Vaccinium angustifolium*, *V. pallidum*) are common associates. This community may be relatively short-lived; it gradually succeeds to a blueberry heath or a forest community. More data on this community are needed.

Distribution: throughout upstate New York, north of the Coastal Lowlands ecozone.

Rank: G4 S4

Sources: NHP field surveys.

21. Successional blueberry heath: a shrubland dominated by ericaceous shrubs that occurs on sites with acidic soils that have been cleared (for logging, farming, etc.) or otherwise disturbed. Characteristic species include blueberries (*Vaccinium corymbosum*, *V. pallidum*, *V. myrtilloides*, *V. stamineum*), black huckleberry (*Gaylussacia baccata*), wintergreen (*Gaultheria procumbens*), trailing arbutus (*Epigaea repens*), poverty-grass (*Danthonia spicata*), and common hairgrass (*Deschampsia flexuosa*). This community may be relatively short-lived; it gradually succeeds to a forest community. More data on this community are needed.

Distribution: throughout New York State.

Rank: G4 S4

Example: Finger Lakes National Forest, Schuyler County.

Source: NHP field surveys.

22. Successional old field: a meadow dominated by forbs and grasses that occurs on sites that have been cleared and plowed (for farming or development), and then abandoned.

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Characteristic herbs include goldenrods (*Solidago altissima*, *S. nemoralis*, *S. rugosa*, *S. juncea*, *S. canadensis*, and *Euthamia graminifolia*), bluegrasses (*Poa pratensis*, *P. compressa*), timothy (*Phleum pratense*), quackgrass (*Agropyron repens*), smooth brome (*Bromus inermis*), sweet vernal grass (*Anthoxanthum odoratum*), orchard grass (*Dactylis glomerata*), common chickweed (*Cerastium arvense*), common evening primrose (*Oenothera biennis*), old-field cinquefoil (*Potentilla simplex*), calico aster (*Aster lateriflorus*), New England aster (*Aster novae-angliae*), wild strawberry (*Fragaria virginiana*), Queen-Anne's-lace (*Daucus corota*), ragweed (*Ambrosia artemisiifolia*), hawkweeds (*Hieracium* spp.), dandelion (*Taraxacum officinale*), and ox-tongue (*Picris hieracioides*). Shrubs may be present, but collectively they have less than 50% cover in the community. Characteristic shrubs include gray dogwood (*Cornus foemina* ssp. *racemosa*), silky dogwood (*Cornus amomum*), arrowwood (*Viburnum recognitum*), raspberries (*Rubus* spp.), sumac (*Rhus typhina*, *R. glabra*), and eastern red cedar (*Juniperus virginiana*). A characteristic bird is the field sparrow (*Spizella pusilla*). This is a relatively short-lived community that succeeds to a shrubland, woodland, or forest community.

Distribution: throughout New York State.

Rank: G4 S4

Example: Finger Lakes National Forest, Schuyler County.

Sources: Mellinger and McNaughton 1975; NHP field surveys.

23. Successional shrubland: a shrubland that occurs on sites that have been cleared (for farming, logging, development, etc.) or otherwise disturbed. This community has at least 50% cover of shrubs. Characteristic shrubs include gray dogwood (*Cornus foemina* ssp. *racemosa*), eastern red cedar (*Juniperus virginiana*), raspberries (*Rubus* spp.), hawthorne (*Crataegus* spp.), serviceberries (*Amelanchier* spp.), choke-cherry (*Prunus virginiana*), wild plum (*Prunus americana*), sumac (*Rhus glabra*, *R. typhina*), nanny-berry (*Viburnum lentago*), arrowwood (*Viburnum recognitum*), and multiflora rose (*Rosa multiflora*). Characteristic animals include American robin (*Turdus migratorius*), willow flycatcher (*Empidonax traillii*), blue-winged warbler (*Vermivora pinus*), and rat snake (*Elaphe obsoleta*).

Distribution: throughout New York State.

Rank: G4 S4

Example: Finger Lakes National Forest, Schuyler County.

Source: NHP field surveys.

B. BARRENS AND WOODLANDS

This subsystem includes upland communities that are structurally intermediate between forests and open canopy uplands. Several physiognomic types are included in this subsystem. Savannas are communities with a sparse canopy of trees (25 to 60% cover), and a groundlayer that is predominantly either grassy or shrubby (these will be called, respectively, grass-savanna and shrub-savanna). Woodlands include communities with a canopy of stunted or dwarf trees (less than 16 ft or 4.9 m tall), and wooded communities occurring on shallow soils over bedrock with numerous rock outcrops. The term "barrens" is commonly applied to both savannas and woodlands (e.g. pine barrens).

1. Serpentine barrens: a grass-savanna community that occurs on shallow soils over outcrops of serpentine bedrock. The appearance and composition of vegetation on serpentine soils is often striking because it represents an abrupt change from surrounding vegetation on non-serpentine soils. In New York this community is known only from Staten Island, where the remnants are relatively disturbed. The best examples of this community occur in southeastern Pennsylvania and northeastern Maryland. On Staten Island, the open grassland areas are dominated by little bluestem (*Schizachyrium scoparium*), panic grasses (such as *Panicum virgatum* and *P. philadelphicum*), Indian grass (*Sorghastrum nutans*), and poverty-grass (*Danthonia spicata*). Characteristic forbs in the grassy areas are heath aster (*Aster ericoides*), calico aster (*A. lateriflorus*), small white snakeroot (*Eupatorium aromaticum*), old-field cinquefoil (*Potentilla simplex*), and green milkweed (*Asclepias viridiflora*). Trees and shrubs are scattered in the barrens; usually there is roughly 20 to 40% cover of trees and 15 to 30% cover of shrubs. On Staten Island, the characteristic woody plants are gray birch (*Betula populifolia*), black oak (*Quercus velutina*), sassafras (*Sassafras albidum*), quaking aspen (*Populus tremuloides*), bayberry (*Myrica pensylvanica*), shining sumac