

## TERRESTRIAL COMMUNITIES

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

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(*Rhus copallinum*), sawbrier (*Smilax glauca*), arrowwood (*Viburnum recognitum*), and blueberries (*Vaccinium corymbosum*, *V. pallidum*). A characteristic butterfly is the arogos skipper (*Atrytone arogos arogos*).

The remnant serpentine barrens of Staten Island are currently lacking many of the species that characterize the serpentine barrens of Pennsylvania and Maryland, such as Virginia pine (*Pinus virginiana*), blackjack oak (*Quercus marilandica*), fameflower (*Talinum teretifolium*), and chickweed (*Cerastium arvense* var. *villosum*).

**Distribution:** only known from the Manhattan Hills ecozone.

**Rank:** G2 S1

**Sources:** Reed 1986; NHP field surveys.

**2. Dwarf pine plains:** a woodland community dominated by dwarf individuals of pitch pine (*Pinus rigida*) and scrub oak (*Quercus ilicifolia*) that occurs on nearly level outwash sand and gravel plains in eastern Long Island. The soils are infertile, coarse textured sands that are excessively well-drained. The canopy of dwarf pitch pines and scrub oaks is generally from 4 to 8 ft (1.2 to 2.4 m) tall, and it may form a dense thicket. The community includes very few species of vascular plants. The majority of the biomass in the community consists of seven woody plant species: pitch pine, scrub oak, black huckleberry (*Gaylussacia baccata*), blueberry (*Vaccinium pallidum*), hudsonia (*Hudsonia ericoides*), bearberry (*Arctostaphylos uva-ursi*), and wintergreen (*Gaultheria procumbens*). The huckleberries and blueberries form a low shrub canopy under the pines and oaks. The groundcover under the oaks and pines includes many foliose and fruticose lichens; the lichen flora is probably more diverse than the vascular plant flora in this community. Characteristic lichens include *Cetraria arenaria*, *Cladonia mitis*, *C. submitis*, *Cladonia alpestris*, *C. cristatella*, *Parmelia rudecta*, *P. saxatilis*, and *Peltigera canina*. There are numerous sandy openings in the shrub thicket with scattered bearberry, wintergreen, hudsonia, and a few low herbs such as jointweed (*Polygonella articulata*), stiff-leaf aster (*Aster linariifolius*), and orange-grass (*Hypericum gentianoides*). This community is a favored nesting area for prairie warbler (*Dendroica discolor*) and brown thrasher (*Taxostoma rufum*); pine warbler (*Dendroica pinus*) and ovenbird (*Seiurus aurocapillus*) are also characteristic birds.

This community also provides prime habitat for the buck moth (*Hemileuca maia*); the largest and most dense population of buck moths in New York occurs in the dwarf pine plains.

**Distribution:** restricted to the Coastal Lowlands ecozone.

**Rank:** G1G2 S1

**Example:** Dwarf Pine Barrens, Suffolk County.

**Sources:** Kerlinger and Doremus 1981; Olsvig 1980; Olsvig et al. 1979; NHP field surveys.

**3. Dwarf pine ridges:** a woodland community dominated by dwarf individuals of pitch pine (*Pinus rigida*) and black huckleberry (*Gaylussacia baccata*), which occurs on flat-topped summits of rocky ridges. The bedrock is a white quartzite conglomerate; soils are very thin, and they are rich in organic matter from litter that has accumulated on the bedrock. Characteristic woody plants associated with the dwarf pines in the tall shrub "canopy" are wild raisin (*Viburnum cassinoides*), black chokeberry (*Aronia melanocarpa*), and stunted gray birch (*Betula populifolia*). There is also a low shrub stratum with blueberries (*Vaccinium angustifolium* and *V. pallidum*), sweet-fern (*Comptonia peregrina*), and sheep laurel (*Kalmia angustifolia*). Characteristic groundlayer species are wintergreen (*Gaultheria procumbens*), bunchberry (*Cornus canadensis*), Canada mayflower (*Maianthemum canadense*), moccasin flower (*Cypripedium acaule*), and cow-wheat (*Melampyrum lineare*). More data on characteristic animals are needed.

The dwarf pine ridges community grades into the pitch pine-oak-heath rocky summit community, which occurs on the top and upper slopes of ridges. The dwarf pine ridges are distinguished primarily by the height of the canopy pines: stands with pines less than 16 ft (4.9 m) tall are classified as dwarf pine ridges.

**Distribution:** only known from the Shawangunk Hills sub-zone of the Hudson Valley ecozone.

**Rank:** G1G2 S1

**Example:** Sam's Point, Ulster County.

**Sources:** Olsvig 1980; NHP field surveys.

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**4. Pitch pine-scrub oak barrens:** a shrub-savanna community that occurs on well-drained, sandy soils that have developed on sand dunes, glacial till, and outwash plains. Pitch pine (*Pinus rigida*) is the dominant tree; the percent cover of pitch pine is variable, ranging from 20 to 60%. The shrublayer dominants are scrub oaks (*Quercus ilicifolia* and *Q. prinoides*), which often form dense thickets. Beneath this tall shrub canopy is a low shrublayer primarily composed of sweet-fern (*Comptonia peregrina*), blueberries (*Vaccinium angustifolium* and *V. pallidum*), and black huckleberry (*Gaylussacia baccata*). These scrub oak thickets cover 60 to 80 percent of the community; pitch pines are scattered through the shrub thicket, occurring as emergent trees within an extensive shrubland. Within the shrub thickets are small patches of grassland dominated by the following prairie grasses: big bluestem (*Andropogon gerardii*), little bluestem (*Schizachyrium scoparium*), and Indian grass (*Sorghastrum nutans*). These grassy areas are usually found near ant mounds, along trails, and in some of the low areas between dunes where the water table may be very close to the soil surface. This community can be rich in species. Characteristic forbs include bush-clovers (*Lespedeza capitata*, *L. hirta*, *L. procumbens*, and *L. stuevii*), pinweed (*Lechea villosa*), milkwort (*Polygala nuttallii*), goat's-rue (*Tephrosia virginiana*), and wild lupine (*Lupinus perennis*). Characteristic butterflies in the barrens of the northern Hudson Valley include Karner blue butterfly (*Lycaeides melissa samuelis*) and frosted elfin (*Incisalia irus*). Buck moth (*Hemileuca maia*) is a characteristic species throughout the range of the community, but the density of buck moths is usually low. Characteristic birds include rufous-sided towhee (*Pipilo erythrophthalmus*), common yellowthroat (*Geothlypis trichas*), field sparrow (*Spizella pusilla*), prairie warbler (*Dendroica discolor*), brown-headed cowbird (*Molothrus ater*), indigo bunting (*Passerina cyanea*), brown thrasher (*Toxostoma rufum*), and whip-poor-will (*Caprimulgus vociferus*).

This community is adapted to and maintained by periodic fires; frequency of fires ranges from 6 to 15 years.

**Distribution:** mainly known from the Coastal Lowlands ecozone and the Central Hudson subzone of the Hudson Valley ecozone; small examples are reported from the Appalachian Plateau ecozone.

**Rank:** G2 S1

**Examples:** Albany Pine Bush, Albany County; Edgewood Oak Brush Plains, Suffolk County.

**Sources:** Cryan and Turner 1981; Forman 1979; Kerlinger and Doremus 1981; Olsvig 1980; NHP field surveys.

**5. Pitch pine-oak-heath woodland:** a pine barrens community that occurs on well-drained, infertile, sandy soils in eastern Long Island (and possibly on sandy or rocky soils in upstate New York). The structure of this community is intermediate between a shrub-savanna and a woodland. Pitch pine (*Pinus rigida*) and white oak (*Quercus alba*) are the most abundant trees, and these form an open canopy with 30 to 60% cover. Scarlet oak (*Quercus coccinea*) and black oak (*Q. velutina*) may also occur in the canopy. The shrublayer is dominated by scrub oaks (*Quercus ilicifolia*, *Q. prinoides*), and includes a few heath shrubs such as huckleberry (*Gaylussacia baccata*) and blueberry (*Vaccinium pallidum*). The density of the shrublayer is inversely related to the tree canopy cover; where the trees are sparse, the shrubs form a dense thicket, and where the trees form a more closed canopy, the shrublayer may be relatively sparse. Stunted, multiple-stemmed white oaks may be present in the shrublayer if the site has burned regularly. Characteristic species of the groundcover include bearberry (*Arctostaphylos uva-ursi*), Pennsylvania sedge (*Carex pensylvanica*), golden heather (*Hudsonia ericoides*), beach heather (*Hudsonia tomentosa*), and pinweed (*Lechea villosa*). Like other closely related pine barrens communities, the woodland provides habitat for buck moth (*Hemileuca maia*) and prairie warbler (*Dendroica discolor*).

This community is adapted to periodic fires; the fire frequency has not been documented, but it probably burns less frequently than pitch pine-scrub oak barrens (i.e. more than 15 years between fires). This community may have a fairly low species richness: it is more diverse than dwarf pine plains, but less diverse than pitch pine-scrub oak barrens.

**Distribution:** currently known only from the Coastal Lowlands ecozone.

**Rank:** G3G4 S2S3

**Examples:** Rocky Point Pine Barrens, Suffolk County; Dwarf Pine Barrens, Suffolk County.

**Source:** NHP field surveys.

**6. Pitch pine-heath barrens:** a shrub-savanna community that occurs on well-drained, sandy or rocky soils. This is a broadly defined community with several regional variants. The most abundant tree is pitch pine (*Pinus rigida*); in some stands there is an admixture of one or more species including big tooth aspen (*Populus grandidentata*), white pine (*Pinus strobus*), or jack pine (*P. banksiana*). The percent cover of trees is variable, ranging from 30 to 60%. The shrublayer is dominated by heath shrubs such as black huckleberry (*Gaylussacia baccata*), blueberries (*Vaccinium angustifolium*, *V. pallidum*, and *V. myrtilloides*), and sheep-laurel (*Kalmia angustifolia*), as well as sweet-fern (*Comptonia peregrina*). This shrublayer may be quite diverse. Characteristic groundlayer species include wintergreen (*Gaultheria procumbens*), wild sarsaparilla (*Aralia nudicaulis*), Canada mayflower (*Maianthemum canadense*), cow-wheat (*Melampyrum lineare*), wild strawberry (*Fragaria virginiana*), moccasin flower (*Cypripedium acaule*), Pennsylvania sedge (*Carex pensylvanica*), and bracken fern (*Pteridium aquilinum*). Characteristic birds include ovenbird (*Seiurus aurocapillus*), veery (*Catharus fuscescens*), common yellowthroat (*Geothlypis trichas*), chestnut-sided warbler (*Dendroica pensylvanica*), and wood thrush (*Hylocichla mustelina*).

This community is distinguished from pitch pine-scrub oak barrens by the dominance in the shrublayer of heath shrubs rather than scrub oaks (*Quercus ilicifolia* and *Q. prinoides*). Scrub oaks may be present, but they are never abundant or dominant in the shrublayer of pitch pine-heath barrens.

*Distribution:* known from sandplains in northern and north-central New York, from the Great Lakes Plain ecozone, Western Adirondack Foothills subzone, and the Champlain Valley subzone.

*Rank:* G4 S2S3

*Examples:* Clintonville Pine Barrens, Clinton County; Rome Sand Plains, Oneida County.

*Source:* NHP field surveys.

**7. Boreal heath barrens:** a dwarf shrubland or shrub-savanna dominated by heath or heath-like shrubs. Boreal heath barrens occur on nearly level outwash plains of the Adirondacks, in frost pockets lying in valleys. Soils are sandy, dry, and poor in nutrients. Boreal heath barrens are

seasonally flooded because the soils have a discontinuous subsurface layer of podzolized soil (an ortstein), which impedes water drainage. The dominant shrubs are blueberries (*Vaccinium myrtilloides*, *V. angustifolium*, *V. vacillans*), black chokeberry (*Aronia melanocarpa*), meadow-sweet (*Spiraea latifolia*), and mountain fly honeysuckle (*Lonicera villosa*). Other characteristic plants include spreading ricegrass (*Oryzopsis asperifolia*), small ricegrass (*Oryzopsis pungens*), swamp dewberry (*Rubus hispidus*), Canada goldenrod (*Solidago canadensis*), flat-top goldenrod (*Euthamia graminifolia*), northern tree clubmoss (*Lycopodium dendroideum*), running-pine (*Lycopodium digitatum*), lichens (*Cladonia alpestris*, *C. pyxidata*, *Cladina rangiferina*), and mosses (*Pleurozium schreberi*, *Polytrichum commune*, and *Dicranum* spp.). Trees may be scattered through the barrens, or they may be confined to the edges of open shrublands. Characteristic trees are black spruce (*Picea mariana*), white pine (*Pinus strobus*), black cherry (*Prunus serotina*), and tamarack (*Larix laricina*). More data are needed on characteristic animals of this community.

*Distribution:* only known from the Adirondacks ecozone.

*Rank:* G3G4 S1

*Example:* Oswegatchie Plains, St. Lawrence County.

*Sources:* Bray 1915; Bray 1921; Curran 1974.

**8. Sandstone pavement barrens:** an open canopy woodland that occurs on very shallow soils over sandstone bedrock; this community is best developed where the bedrock is nearly level, thus forming a pavement. In New York the dominant tree is jack pine (*Pinus banksiana*), although white pine (*P. strobus*) or red pine (*P. resinosa*) are reported as locally dominant in some sites in southern Quebec. Other characteristic trees include red maple (*Acer rubrum*), paper birch (*Betula papyrifera*), red oak (*Quercus rubra*), and scarlet oak (*Q. coccinea*). The shrublayer is dominated by heath shrubs including blueberry (*Vaccinium angustifolium*), black huckleberry (*Gaylussacia baccata*), black chokeberry (*Aronia melanocarpa*), and sweet-fern (*Comptonia peregrina*). The groundcover includes many lichens and mosses, which may form a continuous cover in some areas. Characteristic lichens include *Cladina* spp., *Cladonia* spp., *Stereocaulon*

sp., and *Xanthoparmelia* sp.; characteristic mosses include *Polytrichum* spp. and *Pleurozium schreberi*. Herbs are scattered through this mossy carpet; common herbs include bracken fern (*Pteridium aquilinum*), wintergreen (*Gaultheria procumbens*), poverty-grass (*Danthonia spicata*), and common hairgrass (*Deschampsia flexuosa*). More data on characteristic animals are needed.

This community is only known from the northernmost counties of New York, north of the Adirondacks and from southern Quebec; its distribution outside of this range is unknown, however similar communities may occur in Ontario, Maine, Minnesota, and Iowa.

*Distribution:* only known from the Champlain Transition and Champlain Valley sub-zones of the Lake Champlain ecozone.

*Rank:* G2? S1

*Examples:* Altona Flat Rock, Clinton County; Gadway Road Flat Rock, Clinton County.

*Source:* NHP field surveys.

**9. Oak openings:** a grass-savanna community that occurs on well-drained soils. In New York, these savannas originally occurred as openings within extensive oak-hickory forests. They were restricted to excessively well-drained sites such as on knobs or hilltops with shallow soil over dolomite outcrops, sandy to gravelly soils of kames and eskers, or gravelly glacial deltas and terraces. The best remnants occur on dolomite knobs. Characteristic trees in New York occurrences are chinquapin oak (*Quercus muhlenbergii*), white oak (*Q. alba*), and black oak (*Q. velutina*); these oaks typically occur as open-grown trees with broadly spreading canopies. The oaks are sparsely distributed amidst a grassy groundlayer dominated by Indian grass (*Sorghastrum nutans*), little bluestem (*Schizachyrium scoparium*), and big bluestem (*Andropogon gerardii*). Characteristic forbs in the grassy groundlayer include thimbleweed (*Anemone cylindracea*), butterfly-weed (*Asclepias tuberosa*), tick-trefoils (*Desmodium glabellum*, *D. paniculatum*), wild bergamot (*Monarda fistulosa*), everlasting (*Antennaria* sp.), heath aster (*Aster ericoides*), early goldenrod (*Solidago juncea*), and black-eyed-Susan (*Rudbeckia hirta*). Shrubs are scattered through the grassy area, and they may be locally dominant under the shade of larger trees. Characteristic shrubs include gray dogwood (*Cornus foemina* ssp. *racemosa*), which typically

grows in small clones, and northern dewberry (*Rubus flagellaris*). More data on characteristic animals are needed.

*Distribution:* only known from the Erie-Ontario Plain subzone of the Great Lakes Plain ecozone.

*Rank:* G2 S1

*Example:* Rush Oak Openings, Monroe County.

*Sources:* Shanks 1966; NHP field surveys.

**10. Calcareous pavement barrens:** a savanna community that occurs on nearly level outcrops of calcareous bedrock (limestone and dolomite). The community consists of a mosaic of shrub-savanna, grass-savanna, and rock outcrop vegetation. The trees are either widely spaced or in small clusters; they are usually rooted in rock crevices. Characteristic trees include eastern red cedar (*Juniperus virginiana*), northern white cedar (*Thuja occidentalis*), bur oak (*Quercus macrocarpa*), white ash (*Fraxinus americana*), paper birch (*Betula papyrifera*), white pine (*Pinus strobus*), shagbark hickory (*Carya ovata*), eastern hop hornbeam (*Ostrya virginiana*), white spruce (*Picea glauca*), basswood (*Tilia americana*), American elm (*Ulmus americana*), rock elm (*U. thomasi*), and pin-cherry (*Prunus pennsylvanica*).

Many of the shrubs occur in dense thickets; they are rooted either in rock crevices or in shallow soil over bedrock. Characteristic shrubs include gray dogwood (*Cornus foemina* ssp. *racemosa*), fragrant sumac (*Rhus aromatica*), downy arrowwood (*Viburnum rafinesquianum*), common juniper (*Juniperus communis*), round-leaf dogwood (*Cornus rugosa*), juneberry (*Amelanchier* spp.), poison ivy (*Toxicodendron radicans*), meadow rose (*Rosa blanda*), wild honeysuckle (*Lonicera dioica*), buffalo-berry (*Shepherdia canadensis*), and snowberry (*Symphoricarpos albus*).

The groundlayer in the grass-savanna areas is quite diverse. Characteristic herbs include poverty-grass (*Danthonia spicata*), panic grasses (*Panicum flexile*, *P. philadelphicum*), sedges (*Carex pennsylvanica*, *C. eburnea*, *C. aurea*), slender spikerush (*Eleocharis elliptica* var. *elliptica*), bastard-toadflax (*Comandra umbellata*), harebell (*Campanula rotundifolia*), wild strawberry (*Fragaria virginiana*), pale bluets (*Hedyotis longifolia*), penstemon (*Penstemon hirsutus*), upland white aster (*Solidago ptarmicoides*), balsam groundsel (*Senecio pauperculus*), wild columbine (*Aquilegia canadensis*), blue phlox (*Phlox divaricata*), aster (*Aster ciliolatus*), and goldenrod

(*Solidago hispida*). Fruticose and foliose lichens are locally common in the grassy areas, including *Cladina rangiferina*, *C. mitis*, *Peltigera canina*, and *Cetraria arenaria*.

The numerous small exposures of bedrock have a distinctive flora of lichens, mosses, and small herbs, much like the outcrops in an alvar grassland. Characteristic species of rock outcrops include the lichens *Cladonia pocillum* and *Placynthium nigrum*; the mosses *Tortella tortuosa*, *Tortula ruralis*, *Ceratodon purpureus*, *Grimmia apocarpa*, and *Bryum argenteum*; and several herbs: southern hairgrass (*Agrostis hiemalis*), early saxifrage (*Saxifraga virginensis*), small skullcap (*Scutellaria parvula* var. *leonardii*), and false pennyroyal (*Trichostema brachiatum*).

Characteristic birds include prairie warbler (*Dendroica discolor*) and upland sandpiper (*Barrtramia longicauda*). Characteristic butterflies include Olympia marble butterfly (*Euchloe olympia*), an elfin (*Incisalia polios*), and a dusky wing (*Erynnis lucilius*).

This community has been described from Ontario, where this and related communities are called "alvar".

**Distribution:** mainly known from the Great Lakes Plain ecozone; small examples also occur on limestone in the Appalachian Plateau and Champlain ecozones.

**Rank:** G2G3 S1S2

**Examples:** Limerick Cedars, Jefferson County; Chaumont Barrens, Jefferson County.

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

**11. Alpine krummholz:** a dwarf woodland dominated by balsam fir (*Abies balsamea*) that occurs at or near the summits of the high peaks of the Adirondacks at elevations of 3500 to 4900 ft (1067 to 1494 m). Approximately 85% of the canopy consists of balsam fir; common associates include mountain paper birch (*Betula cordifolia*) and black spruce (*Picea mariana*). Less common are red spruce (*Picea rubens*), old-field juniper (*Juniperus communis*), tamarack (*Larix laricina*), and northern white cedar (*Thuja occidentalis*). The trees form dense stands of stunted trees; at the uppermost elevations below timberline the trees are under 5 ft (1.5 m) tall, with branches extending to the ground (i.e. there is no self-pruning of lower branches), and an average dbh of 3 in (7.6 cm). The groundlayer is densely

shaded; the groundcover consists of a thick carpet of mosses, with scattered lichens and herbs. The dominant bryophytes are *Sphagnum nemoreum*, *Pleurozium schreberi*, *Dicranum scoparium*, *Polytrichum juniperinum*, *P. strictum*, *Ptilidium ciliare*, and *Paraleucobryum longifolium*. *Cladina rangiferina* and *Cetraria islandica* are the most common lichens. Characteristic herbs include bunchberry (*Cornus canadensis*), large-leaf goldenrod (*Solidago macrophylla*), common wood-sorrel (*Oxalis acetosella*), goldthread (*Coptis trifolia*), and Canada mayflower (*Maianthemum canadense*). Characteristic birds include blackpoll warbler (*Dendroica striata*), white-throated sparrow (*Zonotrichia albicollis*), dark-eyed junco (*Junco hyemalis*), yellow-rumped warbler (*Dendroica coronata*), and gray-cheeked thrush (*Catharus minimus*).

**Distribution:** restricted to the Adirondack High Peaks.

**Rank:** G3G4 S2

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

**Source:** NHP field surveys.

**12. Limestone woodland:** a woodland that occurs on shallow soils over limestone bedrock, and usually includes numerous rock outcrops. The tree canopy may be open or closed. There are usually several codominant trees, although one species may become dominant in any one stand. Characteristic canopy trees in some stands are primarily conifers such as northern white cedar (*Thuja occidentalis*), white pine (*Pinus strobus*), white spruce (*Picea glauca*), and balsam fir (*Abies balsamea*). In other stands the characteristic canopy trees are primarily hardwoods such as eastern hop hornbeam (*Ostrya virginiana*), sugar maple (*Acer saccharum*), shagbark hickory (*Carya ovata*), white oak (*Quercus alba*), bur oak (*Q. macrocarpa*), red oak (*Q. rubra*), and basswood (*Tilia americana*). There are also stands that include mixtures of these conifers and hardwoods. More data are needed on these variations in canopy composition and related changes in understory composition. The shrublayer is variable, becoming more dense where the canopy is open and soils are deeper. Characteristic shrubs include gray dogwood (*Cornus foemina* ssp. *racemosa*), wild honeysuckle (*Lonicera dioica*), alder-leaf buckthorn (*Rhamnus alnifolia*), prickly gooseberry (*Ribes cynos-bati*), raspberries (*Rubus*

*idaeus*, *R. occidentalis*), bladdernut (*Staphylea trifolia*), juneberry (*Amelanchier* spp.), and poison ivy (*Toxicodendron radicans*). The groundlayer may be quite diverse, with many grasses, sedges, and forbs. Characteristic herbs include sedges (*Carex eburnea*, *C. pennsylvanica*, *C. platyphylla*), marginal wood fern (*Dryopteris marginalis*), rattlesnake fern (*Botrychium virginianum*), bracken fern (*Pteridium aquilinum*), barren strawberry (*Waldsteinia fragarioides*), big-leaf aster (*Aster macrophyllus*), wild strawberry (*Fragaria virginiana*), black snakeroot (*Sanicula marilandica*), herb-robert (*Geranium robertianum*), Canada mayflower (*Maianthemum canadense*), false Solomon's-seal (*Smilacina racemosa*), early meadow-rue (*Thalictrum dioicum*), white trillium (*Trillium grandiflorum*), and blue-stem goldenrod (*Solidago caesia*). Shaded rock surfaces and crevices often support ferns such as rock polypody (*Polypodium virginianum*) and maidenhair spleenwort (*Asplenium trichomanes*). More data on characteristic animals are needed.

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

*Rank:* G3G4 S2S3

*Examples:* Chaumont Barrens, Jefferson County; Valcour Island, Clinton County.

*Sources:* Reschke and Gilman 1988; NHP field surveys.

**13. Ice cave talus community:** a community that occurs on rocks and soil at the base of talus slopes that emit cold air. The emission of cold air results from air circulation among the rocks of the talus slope where winter ice remains through the summer. The air is cooled by the ice deep in the talus, and settles; gravity eventually forces the air out along the face of rocks at the base of the slope (Core, 1968). The vegetation is distinctive because it includes species characteristic of climates much cooler than the climate of the area where the ice caves occur. For example, at the ice caves of the Shawangunks in southeastern New York, there are northern species such as black spruce (*Picea mariana*), hemlock (*Tsuga canadensis*), mountain ash (*Sorbus americana*), and creeping snowberry (*Gaultheria hispidula*); the surrounding communities are mostly pine barrens and oak forests. Some rare bryophytes have been collected from these talus slopes, including *Mylia taylori* from the Shawangunks and *Anastrophyllum*

*saxicola* and *Mnium hymenophylloides* from Wilmington Notch in the Adirondacks. A characteristic animal is the rock vole (*Microtus chrotorrhinus*).

In the midwest, similar cold air producing talus slopes have been called "algific talus slopes", and they are the habitat of a rare species of snail. In New York these communities need to be surveyed; special attention should be paid to their invertebrate fauna.

*Distribution:* not well known, reported from the Adirondacks ecozone and the Shawangunk Hills subzone of the Hudson Valley ecozone.

*Rank:* G3? S1S2

*Examples:* Indian Pass, Essex County; Sam's Point, Ulster County.

*Sources:* Core 1968; comments by Norton Miller (of the New York State Museum Biological Survey); NHP field surveys.

**14. Calcareous talus slope woodland:** an open or closed canopy woodland that occurs on talus slopes composed of calcareous bedrock such as limestone or dolomite. The soils are usually moist and loamy; there may be numerous rock outcrops. Characteristic trees include sugar maple (*Acer saccharum*), white ash (*Fraxinus americana*), eastern hop hornbeam (*Ostrya virginiana*), white oak (*Quercus alba*), eastern red cedar (*Juniperus virginiana*), and northern white cedar (*Thuja occidentalis*). Shrubs may be abundant if the canopy is open; characteristic shrubs include round-leaf dogwood (*Cornus rugosa*), downy arrowwood (*Viburnum rafinesquianum*), prickly ash (*Zanthoxylum americanum*), and bladdernut (*Staphylea trifolia*). Herbaceous vegetation may be quite diverse; characteristic species include bulblet fern (*Cystopteris bulbifera*), lady fern (*Athyrium asplenoides*), bottlebrush grass (*Elymus hystrix*), Solomon's-seal (*Polygonatum pubescens*), wild ginger (*Asarum canadense*), white baneberry (*Actaea pachypoda*), early meadow-rue (*Thalictrum dioicum*), bloodroot (*Sanguinaria canadensis*), blue-stem goldenrod (*Solidago caesia*), and white wood aster (*Aster divaricatus*). Rock outcrops may have ferns such as walking fern (*Camptosorus rhizophyllus*) and maidenhair spleenwort (*Asplenium trichomanes*).

## TERRESTRIAL COMMUNITIES

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

**Rank:** G3G4 S3

**Example:** Clarence Escarpment, Erie County.

**Sources:** McVaugh 1958; Zenkert 1934; NHP field surveys.

**15. Acidic talus slope woodland:** an open to closed canopy woodland that occurs on talus slopes composed of non-calcareous bedrock such as granite, quartzite, or schist. Characteristic trees (in Columbia County) include sugar maple (*Acer saccharum*), white ash (*Fraxinus americana*), chestnut oak (*Quercus montana*), red oak (*Q. rubra*), and white oak (*Q. alba*); striped maple (*Acer pensylvanicum*) and mountain maple (*A. spicatum*) are common subcanopy trees. Characteristic groundlayer species (in Columbia County) include many ferns: bulblet fern (*Cystopteris bulbifera*), fragile fern (*Cystopteris fragilis*), christmas fern (*Polystichum acrostichoides*), marginal wood fern (*Dryopteris marginalis*), silvery spleenwort (*Athyrium thelypteroides*), and maidenhair fern (*Adiantum pedatum*). Other common herbs include ricegrass (*Oryzopsis racemosa*), bloodroot (*Sanguinaria canadensis*), blue cohosh (*Caulophyllum thalictroides*), ginseng (*Panax quinquefolius*), and zig-zag goldenrod (*Solidago flexicaulis*). Characteristic animals include copperhead (*Agkistrodon contortrix*) and timber rattlesnake (*Crotalus horridus*). More data on this community are needed.

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

**Rank:** G4? S3S4

**Sources:** McVaugh 1958; Significant Habitat Unit files.

**16. Shale talus slope woodland:** an open to closed canopy woodland that occurs on talus slopes composed of shale. These slopes are rather unstable, and they are usually very well-drained, so the soils are shallow and dry. The canopy cover is usually less than 50%, due to the instability of the substrate. Characteristic trees include chestnut oak (*Quercus montana*), pignut hickory (*Carya glabra*), red oak (*Quercus rubra*),

white oak (*Q. alba*), white pine (*Pinus strobus*), white ash (*Fraxinus americana*), and eastern red cedar (*Juniperus virginiana*). Characteristic shrubs and herbs include smooth sumac (*Rhus glabra*), scrub oak (*Quercus prinoides*), poison ivy (*Toxicodendron radicans*), penstemon (*Penstemon hirsutus*), everlasting (*Antennaria plantaginifolia*), and Pennsylvania sedge (*Carex pensylvanica*). More data on this community are needed.

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

**Rank:** G3G4 S3

**Example:** Chemung Shale Slope, Chemung County.

**Sources:** McVaugh 1958; NHP field surveys.

**17. Pitch pine-oak-heath rocky summit:** a community that occurs on warm, dry, rocky ridgetops and summits where the bedrock is non-calcareous (such as quartzite, sandstone, or schist), and the soils are more or less acidic. The vegetation may be sparse or patchy, with numerous rock outcrops. Characteristic species include pitch pine (*Pinus rigida*), chestnut oak (*Quercus montana*), scrub oak (*Q. ilicifolia*), common juniper (*Juniperus communis*), blueberry (*Vaccinium angustifolium*), sweet-fern (*Comptonia peregrina*), black huckleberry (*Gaylussacia baccata*), Pennsylvania sedge (*Carex pensylvanica*), poverty-grass (*Danthonia spicata*), common hairgrass (*Deschampsia flexuosa*), three-toothed cinquefoil (*Potentilla tridentata*), and cow-wheat (*Melampyrum lineare*). Characteristic lichens include *Cetraria arenaria* and *Cladonia* spp. More data on this community are needed.

**Distribution:** common in the Hudson Valley ecozone, also occurs in the Appalachian Plateau ecozone, and along the St. Lawrence River in the St. Lawrence Plains subzone.

**Rank:** G4 S3S4

**Examples:** Minnewaska State Park, Ulster County; Mohonk Preserve, Ulster County; Shunnemunk Mountain, Orange County.

**Sources:** McVaugh 1958; Olsvig 1980; NHP field surveys.

## TERRESTRIAL COMMUNITIES

**18. Spruce-fir rocky summit:** a community that occurs on cool, dry, rocky ridgetops and summits where the bedrock is non-calcareous (such as anorthosite, quartzite, or sandstone), and the soils are more or less acidic. The vegetation may be sparse or patchy, with numerous rock outcrops. The species have predominantly boreal distributions. Characteristic species include red spruce (*Picea rubens*), balsam fir (*Abies balsamea*), mountain ash (*Sorbus americana*), harebell (*Campanula rotundifolia*), three-toothed cinquefoil (*Potentilla tridentata*), mountain goldenrod (*Solidago spathulata* ssp. *randii*), common hairgrass (*Deschampsia flexuosa*), and small ricegrass (*Oryzopsis pungens*). There are usually many mosses and lichens growing on rock outcrops. More data on this community are needed.

*Distribution:* primarily in the Adirondack and Catskill mountains.

*Rank:* G4 S3S4

*Example:* Pitchoff Mountain, Essex County.

*Source:* NHP field surveys.

**19. Red cedar rocky summit:** a community that occurs on warm, dry, rocky ridgetops and summits where the bedrock is calcareous (such as limestone or dolomite), and the soils are more or less calcareous. The vegetation may be sparse or patchy, with numerous rock outcrops. Characteristic species include eastern red cedar (*Juniperus virginiana*), shagbark hickory (*Carya ovata*), eastern hop hornbeam (*Ostrya virginiana*), serviceberry (*Amelanchier* spp.), little bluestem (*Schizachyrium scoparium*), sedge (*Carex eburnea*), and everlasting (*Antennaria plantaginifolia*). More data on this community are needed.

*Distribution:* throughout upstate New York, north of the Coastal Lowlands ecozone, where bedrock is calcareous; more common in the southern part of this range.

*Rank:* G3G4 S3

*Example:* Nellie Hill, Dutchess County.

*Source:* NHP field surveys.

**20. Northern white cedar rocky summit:** a community that occurs on cool, dry, rocky

ridgetops and summits where the bedrock is calcareous (such as limestone or dolomite), and the soils are more or less calcareous. The vegetation may be sparse or patchy, with numerous rock outcrops. The species have predominantly boreal distributions. Characteristic species include northern white cedar (*Thuja occidentalis*), eastern hop hornbeam (*Ostrya virginiana*), red pine (*Pinus resinosa*), upland white aster (*Solidago ptarmicoides*), sedge (*Carex eburnea*), and oatgrass (*Trisetum triflorum*). More data on this community are needed.

*Distribution:* in upstate New York north of the Hudson Highlands ecozone, where bedrock is calcareous; more common in the northern part of this range.

*Rank:* G3G4 S3

*Source:* NHP field surveys.

**21. Successional red cedar woodland:** a woodland community that commonly occurs on abandoned agricultural fields and pastures, usually at elevations less than 1000 ft (305 m). The dominant tree is eastern red cedar (*Juniperus virginiana*), which may occur widely spaced in young stands and may be rather dense in more mature stands. Smaller numbers of gray birch (*Betula populifolia*), hawthorn (*Crataegus* spp.), buckthorn (*Rhamnus cathartica*), and other early successional hardwoods may be present. On slopes along the Finger Lakes, red cedar is commonly found mixed with white ash (*Fraxinus americana*) and black walnut (*Juglans nigra*). Shrubs and groundlayer vegetation are similar to a successional old field; in some stands the groundcover consists of a nearly pure stand of non-native bluegrasses such as *Poa compressa* and *P. pratensis*. A characteristic bird is the prairie warbler (*Dendroica discolor*).

*Distribution:* throughout New York State.

*Rank:* G5 S5

*Source:* NHP field surveys.