Chapter 7

Terrestrial Herbaceous Openings

Terrestrial herbaceous opening - Unionville Serpentine Barrens, Chester County. Photograph by Staff of the Pennsylvania Science Office of The Nature Conservancy.

Terrestrial herbaceous opening - Side-oats gramma calcareous grassland, Westfall Ridge Prairie, Juniata County. Photograph by Julie Lundgren.

Little bluestem - Pennsylvania sedge opening

These grasslands occur on dry, acidic sites (usually over sandstone) where woody invasion is prevented or slowed by thin soil, droughty conditions, microclimate (frost pockets), frequent fire, or other disturbance regime. Some of these sites include rock outcrops and near-vertical cliffs. Species include *Schizachyrium scoparium* (little bluestem), *Carex pensylvanica* (Pennsylvania sedge), *Danthonia spicata* (poverty grass), *Deschampsia flexuosa* (common hairgrass), *C. communis* (a sedge), *Rubus flagellaris* (prickly dewberry), *Lespedeza* spp. (bush-clovers), and less commonly, *Oryzopsis pungens*[S] (slender mountain ricegrass). Mosses and lichens, especially *Cladonia* spp. and *Cladina* spp. (reindeer lichens), and *Polytrichum* spp. (hairy-cap mosses) are abundant on some sites. This community type may occur as part of the "Ridgetop acidic barrens complex."

Related types: This community type may occur as openings in any of the dry acidic woody types (forests, woodlands, or shrublands).

Range: Entire state.

Selected references: Carke 1946, Hough 1945, Schegel and Butch 1980.

[Crosswalk: Smith's "Acidic Rocky Summit," "Ridgetop Dwarf-Tree Forest" (in part), TNC - no crosswalk.**]**

Side-oats gramma calcareous grassland

These grasslands occur as small (usually well under 0.5 hectares) prairie-like openings in areas of thin soils over calcareous bedrock. The dominant vegetation is graminoid, although scattered forbs and woody species are usually also present. Characteristic species include *Bouteloua curtipendula*[S] (side-oats gramma), *Andropogon gerardii* (big bluestem), *Sorghastrum nutans* (Indian grass), *Panicum virgatum* (switchgrass), *Schizachyrium scoparium* (little bluestem), *Carex pensylvanica* (Pennsylvania sedge), *Lespedeza* spp. (bush clovers), *Desmodium* spp. (tick-trefoil), *Asclepias verticillata* (whorled milkweed), A. *viridiflora* (green milkweed), *Onosmodium molle* ssp. *Hispidissimum*[S] (false gromwell), *Senecio obovatus* (groundsel), *Lithospermum canescens* (hoary pucccoon), and *Solidago bicolor* (silver-rod). Typical woody species, which may occur scattered throughout or at margins, include *Cercis canadensis* (redbud), *Celtis tenuifolia* (dwarf hackberry), *Juniperus virginiana* (red-cedar), *Fraxinus americana* (white ash), *Quercus muhlenbergii* (yellow oak), *Ostrya virginiana* (hop-hornbeam), *Cornus florida* (flowering dogwood), *Rhus glabra* (smooth sumac), *Rhus aromatica* (fragrant sumac), and *Viburnum rafinesquianum* (downy arrow-wood).

Related types: Several woodland and shrubland types may contain openings of *Bouteloua curtipendula*[S] (side-oats gramma) and other grasses. These types include the "Yellow oak - redbud woodland," and the "Red-cedar -redbud shrubland." Very small openings within a matrix of these types may be considered to be part of the woodland or shrubland types in which they occur. The "Calcareous opening/cliff" is another open calcareous community type. The cliff type tends to occur on small outcrops or on steep slopes or cliffs. There is generally some degree of shading either from the landform itself or from the surrounding vegetation. Grasses dominate the grassland type, while forbs and ferns dominate the cliff type.

Range: Ridge and Valley, Piedmont.

Selected references: PNDI field surveys.
[Crosswalk: Smith's "Northern Appalachian Calcareous Rocky Summit" (in part), TNC's *Schizachyrium scoparium - Bouteloua curtipendula* Herbaceous Alliance.**]**

Calcareous opening/cliff

This community type occurs on calcareous cliffs, outcrops, and rocky slopes. There is generally some degree of shading from the surrounding forest or woodland community or from the land form itself. Species composition varies with the amount of moisture, shade and exposure. Herbaceous species include *Aquilegia canadensis* (wild columbine), *Dodecatheon meadia*[S] (shooting star), *Aster ericoides*[S] (white heath aster), *A. oblongifolius* (aromatic aster), *Cystopteris bulbifera* (bladder fern), *Bouteloua curtipendula*[S] (side-oats gramma), *Pellaea atropurpurea* (purple cliff-brake), *Dryopteris marginalis* (evergreen wood fern), *Allium cernuum* (nodding onion), *Heuchera americana* (alum-root), *Carex oligocarpa* (a sedge), *Asplenium trichomanes* (maidenhair spleenwort), *Arabis hirsuta*[S] (hairy rock-cress), *A. lyrata* (lyre-leaved rock-cress) and *Saxifraga virginiensis* (early saxifrage). Woody species may occur scattered throughout or at the margins, these species include *Juniperus virginiana* (red-cedar), *Rhus aromatica* (fragrant sumac), *Toxicodendron radicans* (poison-ivy), *Hydrangea arborescens* (seven-bark), *Fraxinus americana* (white ash), *Parthenocissus quinquefolia* (Virginia creeper), *Cercis canadensis* (redbud), *Tilia americana* (basswood), *Carya* spp. (hickories), *Quercus muhlenbergii* (yellow oak), *Ostrya virginiana* (hop-hornbeam), and *Cornus florida* (flowering dogwood).

Related types: The "Yellow oak - redbud woodland" may contain openings that resemble this type. Small openings within a matrix of this or other types may be considered to be part of the forest, woodland, or shrubland types in which they occur. The "Side-oats gramma calcareous

grassland" is another open calcareous community type. Grasses dominate the grassland type, while forbs and ferns dominate the cliff type. This type tends to occur on small outcrops or on steep slopes or cliffs, often in a forested context, while the grassland type is generally more open, less steep, and often grades into a shrubland or woodland at the edges.

Selected references: PNDI field surveys.

Range: Ridge and Valley, Piedmont, and perhaps Allegheny Mountain and the Pittsburgh Plateau.

[Crosswalk: Smith's "Northern Appalachian Calcareous Cliff Community," TNC's *Pellaea atropurpurea* Sparsely Vegetated Calcareous Cliff Alliance.**]**

Serpentine grassland

This community type is part of the "Serpentine barren complex." It is restricted to areas underlain by serpentinite bedrock. The dense, prairie-like graminoid cover is usually dominated by warm-season (C_4) grasses. Warm-season grasses characteristic of this community include *Schizachyrium scoparium* (little bluestem), *Muhlenbergia mexicana* (muhly), *Eragrostis spectabilis* (purple love-grass), *Setaria geniculata* (perennial foxtail), *Andropogon gerardii* (big bluestem), *Sporobolus heterolepis*[S] (prairie dropseed), *Sorghastrum nutans* (Indian grass), and *Bouteloua curtipendula*[S] (side-oats gramma). Other species commonly found include *Senecio anonymus*[S] (plain ragwort), *Aristida purpurascens*[S] (arrow-feather), *A. dichotoma* (churchmouse three-awn), *Aster depauperatus*[S] (serpentine aster), *Panicum acuminatum* (a panic-grass), *P. annulum* (annulus panic-grass), *P. dichotomum* (a panic-grass), *P. oligosanthes* (a panic-grass), *P. sphaerocarpon* (a panic-grass), *Potentilla canadensis* (old-field cinquefoil), *Rosa carolina* (prairie rose), *Setaria geniculata* (perennial foxtail), *Cerastium arvense* var. *villosissimum'* (barrens chickweed), *Phlox subulata* ssp. *subulata* (creeping phlox), *Achillea millefolium*[I] (yarrow), *Eupatorium aromaticum* (small white snakeroot), *Scleria pauciflora* (few-flowered nutrush), *Oenothera fruticosa* (sundrops), *Solidago nemoralis* (gray goldenrod), *Antennaria plantaginifolia* (plantain pussytoes), *Asclepias verticillata* (whorled milkweed), and A. *viridiflora* (green milkweed).

Related types: This community may be said to end either where graminoid dominance and continuous soil substrate ends (here the "Serpentine gravel forb community" generally begins), or where shrub cover reaches about 25% (here the "Red-cedar - pine serpentine shrubland" generally begins).

Range: Piedmont.

Selected references: Latham 1992, PNDI field surveys.

[Crosswalk: Smith's "Eastern Serpentine Barren," TNC's *Pinus (virginiana, rigida) / Schizachyrium scoparium* Herbaceous Alliance, *Pinus virginiana - Pinus rigida / Schizachyrium scoparium - Scleria pauciflora* Community.**]**

Serpentine gravel forb community

This community type is part of the "Serpentine barren complex." It occurs exclusively on areas of gravel or very thin soil over serpentine bedrock. These areas are not shaded; conditions are intermittently extremely dry and daytime surface temperatures are high. These factors combined with the serpentine chemistry of the substrate support a community with sparse, xeromorphic forb cover. It is in these areas that the majority of serpentine endemic plant species are found. Characteristic species include *Asclepias verticillata* (whorled milkweed), *Arabis lyrata* (lyre-leaved rock-cress), *Minuartia michauxii* (rock sandwort), *Aster depauperatus*[S] (serpentine aster), *Cerastium arvense* var. *villosissimum*[S] (barrens chick-weed), *Fimbristylis annua*[S] (annual fimbry), *Aristida dichotoma* (churchmouse three-awn), A. *longispica* (slimspike three-awn), *Chamaecrista fasciculata* (prairie senna), *Juncus secundus* (one-sided rush), *Panicum sphaerocarpon* (a panic grass), *Polygala verticillata* (whorled milkwort), *Polygonum tenue* (slender knotweed), *Sporobolus vaginiflorus* (poverty grass), *Viola sagittata* (arrow-leaved violet), *Scleria pauciflora*[S] (few-flowered nut-rush), *Talinum teretifolium*[S] (round-leaved fame-flower), *Phlox subulata* ssp. *subulata* (moss-pink), and stunted *Schizachyrium scoparium* (little bluestem).

Related types: This community type generally grades into the "Serpentine grassland" type. They may be delineated where sod formation and graminoid dominance begins.

Range: Piedmont.

Selected references: Latham 1992, PNDI field surveys.
[Crosswalk: Smith's "Eastern Serpentine Barren," TNC's *Cerastium arvense* Sparsely Vegetated Alliance.**]**

Great Lakes Region dry sandplain

These are dry grasslands occurring on sand deposits along the Lake Erie shoreline. In Pennsylvania, this community type occurs only at Presque Isle. The dominant species are *Sorghastrum nutans* (Indian grass), *Panicum virgatum* (switch grass), and *Schizachyrium scoparium* (little bluestem). Other species commonly present

include *Carex muhlenbergii* (a sedge), *C. tonsa* (a sedge), *Rumex acetosella*[I] (sheep sorrel), and *Panicum commonsianum*[S] (panic grass). There may be scattered shrubs and small trees, although they usually contribute less than 25% cover overall. The most common woody species are *Populus deltoides* (cottonwood), *Betula pendula*[I] (European white birch), and *Myrica pensylvanica* (bayberry). This community type is part of the "Great Lakes Region beach - dune - sandplain complex."

Related types: This type often grades into the "Great Lakes Region bayberry - cottonwood community", which represents a somewhat later successional stage. This type may also resemble the "Great Lakes Region palustrine sandplain." Because of the sandy soils on which both types occur, the wetter type may appear dry for much of the year. It is the difference in species composition that distinguishes the two types.

Range: Great Lakes Region.

Selected references: Bissell and Bier, 1987.

[Crosswalk: Smith's "Eastern Great Lakes Sand Plain," TNC's *Panicum virgatum - Schizachyrium scoparium* Herbaceous Alliance.**]**

Great Lakes Region sparsely vegetated beach

This community occupies the sand or gravel shores from the normal water line to the upper limit of winter storms. The substrate is very unstable and subject to wave action and ice scour. The vegetation is sparse (usually less than 25% total cover). The most characteristic species are *Ammophila breviligulata*[S] (American beachgrass), *Cakile edentula*[S] (sea-rocket), *Elymus canadensis* (Canada wild-rye), *Potentilla anserina*[S] (silverweed), and *Xanthium strumarium* var. *canadense* (cocklebur). This community type is part of the "Great Lakes Region beach - dune -sandplain complex."

Related types: This type generally grades into either the "Great Lakes Region dry sandplain" or the "Great Lakes Region bayberry - cottonwood community." This community occupies the beach and foredune, generally ending just short of the dune crest.

Range: Great Lakes Region.

Selected references: Bissell and Bier, 1987.

[Crosswalk: Smith's "Eastern Great Lakes Beach Community," TNC's *Cakile edentula* Herbaceous Alliance, *Cakile edentula - Potentilla anserina* Community).**]**