Chapter 9

Community Complexes

Mesic till barrens complex

Great Lakes Region scarp complex

Acidic glacial peatland complex

Community Complexes

Communities, like species, do not occur randomly scattered across the landscape, they generally form patterns of some kind. In come cases they form fairly organized groupings. These groupings are, in a sense, communities of communities. Under particular environmental conditions, certain groups of communities will tend to occur, often in a similar distribution pattern from site to site. These groups of communities are called here community complexes.

Just as a community-based approach to conservation is becoming increasingly accepted as a highly efficient supplement to species-based efforts, the examination of relationship between community types is providing insight into ecosystem functioning and provides information vital to preserve design and other activities concerned with population viability.

The community complex approach is reserved for cases in which community distribution patterns are fairly distinct and recognizable. This tends to be the case where environmental influences on plant species distribution are especially restrictive. In these areas, environmental factors so strongly shape patterns of species and community distribution that random factors become less confounding. In systems where environmental conditions are less restrictive, species and communities can more freely arrange themselves according to factors such as propagule recruitment and localized disturbance history. In these areas, repeating, environmentally driven patterns of community distribution may be difficult or impossible to recognize. For that reason, only a handful of community complexes are described. In future iterations of this classification it may be possible to describe additional complexes. In most cases, however, communities do not display sufficiently distinct, repeating distribution patterns to be included in this section.

The community complex section of this classification represents a selection of special situations rather than a parallel classification system or a level in the classification hierarchy. It should also be remembered that just as any given community example will not contain all the species associated with that type, and may contain some which appear incongruent or transitional, so do examples of community complexes vary in composition. More information is needed to better describe the ecology and composition of the complexes given here, and to describe additional complex types.

ACIDIC GLACIAL PEATLAND COMPLEX

Community types that characterize this complex*:

Black spruce – tamarack peatland forest
Black spruce – tamarack woodland
Highbush blueberry – sphagnum wetland
Leatherleaf – bog rosemary peatland
Leatherleaf – cranberry peatland
Water-willow (*Decodon verticillatus*) shrub wetland
Sphagnum – beaked rush peatland

(*Note: several of these community types also occur in other landscape settings. Examples of this Complex need not contain all of the community types listed. Other community types may occur within examples of this complex.**)**

Description: This complex encompasses a group of oligotrophic peatlands occurring in glaciated areas. They form in basins with a variety of morphologies, sizes, and origins. This complex includes but is not limited to "kettlehole bogs." Kettlehole bogs are peatlands that form in kettlehole lakes. A kettlehole lake forms when an isolated block of ice is buried by stratified glacial drift that was contained in a glacier and deposited by melt water. As the ice block melts, a deep lake forms, and the outlet is dammed by glacial debris. In this case, as vegetation develops around the edges of the lake, it extends itself out from the shore as a floating mat. This mat may continue to develop until the entire lake is covered by sphagnum peat and associated vegetation, or an open water area may remain near the center. Not all of the peatlands in this complex formed in this way, and not all occur as floating mats. For more detailed information on peatland origins, structure, and development, consult Johnson

Acidic glacial peatland complex- Columbus bog, State Game Lands 197, Warren County. Photograph by Paul Wiegman.

Acidic glacial peatland complex- Little mud pond, Pike County. Photograph by Staff of the Pennsylvania Science Office of The Nature Conservancy.

(1985), Crum (1992) and others. This complex includes a variety of peatlands that receive little or no groundwater input, and only limited input from overland flow. They are saturated to the surface throughout the year and are nutrient-poor and highly acidic, at least in the upper levels.

The vegetation of these peatlands is dominated by evergreen and semi-evergreen shrubs *(Chamaedaphne calyculata, Andromeda polifolia, Kalmia polifolia, Vaccinium corymbosum, V. oxycoccos, V. macrocarpon),* coniferous trees *(Picea mariana, Larix laricina),* and continuous layer of sphagnum mosses *(Sphagnum* spp.). Scattered hardwood trees may occur (e.g. *Betula* spp., *Acer rubrum).* Herbaceous biomass is generally low, with sedges (e.g. *Eriophorum vaginatum, E. virginicum, Rhynchospora alba)* being the most abundant group. Insectivorous plants *(Sarracenia purpurea, Drosera intermedia, D. rotundifolia, Utricularia* spp.) are also characteristic of this complex. In many of these peatland complexes, especially those in kettle holes, vegetation occurs in concentric rings, with forest or woodland physiognomy near the upland border giving way to tall shrubs, then stunted shrubs, and finally dwarf shrubs and herbs near the center. A continuous sphagnum layer is usually present. There may be an area of open water near the center. This may or may not have a fringe of *Decodon verticillatus* (water-willow) surrounding it.

Range: Glaciated NE, Glaciated NW, Pocono Plateau.

Crosswalk: This complex is roughly equivalent to Smith's (1991) "Oligotrophic kettlehole bog," although less restricted in landscape setting.

Selected references: Braun 1950, Crum 1992, Halma 1980, Henry 1950, Jennings 1927, Johnson 1985, PNDI Field forms, VanDersal 1936.

GREAT LAKES REGION SCARP COMPLEX

Community types that characterize this complex*:

Great Lakes Region scarp seep
Great Lakes Region scarp woodland

(***Note:** Examples of this complex need not contain both community types.)

General description:
This complex describes the vegetation of the extremely steep, actively eroding lakeshore-bluff and creek-wall slopes along Lake Erie. Included are one terrestrial and one palustrine community type. The dominant aspect is that of a woodland (between 10% and 60% cover by trees at least 5m tall), although some sites are forested and others are more open. Vegetation may be sparse, with some areas remaining unvegetated. Physiognomic differences generally reflect different seral stages in this very dynamic system. Common woody species include *Acer saccharum* (sugar maple), *Populus deltoides* (cottonwood), *Tsuga canadensis* (eastern hemlock), *Carpinus caroliniana* (hornbeam), *Ostrya virginiana* (hop-hornbeam), *Juniperus virginiana* (red-cedar), *Salix* spp. (willows), *Cornus rugosa* (round-leaved dogwood), *C. sericea* (red-osier dogwood), *C. alternifolia* (alternate-leaved dogwood), *Rhus typhina* (staghorn sumac) *Rubus odoratus* (purple-flowering raspberry), and *Amelanchier arborea* (shadbush). Herbaceous species include *Aster cordifolius* (heart-leaved aster), *Thalictrum dioicum* (early meadow rue), *Dryopteris marginalis* (marginal wood fern), *Solidago flexicaulis* (zigzag goldenrod), *Impatiens pallida* (pale jewelweed), *Phragmites australis*[1] (common reed), *Arisaema triphyllum* (jack-in-the-pulpit), *Glyceria striata* (fowl mannagrass), *Equisetum arvense* (common horsetail), and the exotic species *Tussilago farfara*[1] (coltsfoot). This complex has a somewhat different species composition on bluffs that front Lake Erie than on creek-wall scarps (Charles Bier, personal communication). More data are needed to determine if they warrant separation.

Great Lakes Region scarp complex- Erie County. Photograph by Staff of the Western Pennsylvania Conservancy.

Great Lakes Region scarp complex- Erie County. Photograph by Staff of the Western Pennsylvania Conservancy.

The "Great Lakes Region scarp seep" community type occurs where the substrate is saturated by groundwater seepage. These areas are actively "slumping" and extremely dynamic in terms of species composition and structure. In the case of creek gorge seeps, groundwater seepage occurs at the interface of glacial and glaciallacustrine deposits and the underlying eroded shales and sandstone. On the lakeshore bluffs, the seeps usually occur at the boundary of old beach deposits of sand and gravel, and an underlying layer of dense, more restrictive till. These communities are characteristically open. Some are completely herbaceous, but most contain shrubs, and sometimes scattered trees. This is a very dynamic system, and the structure of the vegetation depends largely on its successional status. Recently slumped areas are first colonized by bryophytes and *Equisetum* spp. (horsetails). As the substrate becomes more stable and organic matter accumulates, graminoids and other herbs and shrubs colonize the seep. Eventually, perhaps in part due to the weight of the vegetation and organic matter, the entire community will "slump" or slide downslope, and the cycle begins again. More protected sites tend to slump less frequently, and may develop a tree canopy.

The complex is united by its unique physical environment rather than a particular set of species. The species composition and physiognomy of this complex vary greatly from site to site. This variation is at least partially in response to aspect, soil characteristics, hydrology, exposure, and distance from the lake. It may be useful in the future to define variants of this complex or its communities based on such relatively stable environmental variables. However, because the vegetation on any given site is likely to change dramatically over the course of one to several decades, from a conservation perspective it may be less useful to differentiate between the various physiognomies/successional stages contained within this complex.

Range: Great Lakes Region.

Crosswalk: This complex is equivalent to Smith's (1991) "Eastern Great Lakes Bluff/Cliff Community."

Selected references: Kline 1993, WPC and TNC 1998.

ERIE LAKESHORE BEACH – DUNE –

SANDPLAIN COMPLEX

Community types that characterize this complex*:

Great Lakes Region cottonwood - bayberry community
Great Lakes Region dry sandplain
Great Lakes Region palustrine sandplain
Great Lakes Region bayberry - mixed shrub palustrine shrubland
Great Lakes Region sparsely vegetated beach

(***Note:** some of these community types also occur in other landscape settings.)

Description: This complex occurs in Pennsylvania only on Presque Isle—a sandspit peninsula that extends about seven miles into Lake Erie. The complex is best developed along the terminal one-third, from the lighthouse to the tip of the sandspit. It includes sparsely vegetated beaches, dunes of varying degrees of stability, and both dry and palustrine sand plains. *Populus deltoides* (cottonwood) dominates the discontinuous tree stratum. *Myrica pensylvanica* (bayberry) and a variety of other shrubs cover extensive areas both palustrine and terrestrial. The herbaceous stratum is extremely diverse and variable; some of the more common species include *Calamagrostis canadensis* (bluejoint), *Panicum virgatum* (switchgrass), *Schizachyrium scoparium* (little bluestem), *Andropogon gerardii* (big bluestem), and *Ammophila breviligulata* (beach grass). In addition, at least 12 plant species of special concern are found in this complex.

Great Lakes Region scarp complex- Presque Isle State Park, Erie County. Photograph by Tom Smith.

Great Lakes Region scarp complex- Presque Isle State Park, Erie County. Photographs by Paul Wiegman.

This complex occurs on a substrate of glacial sand and gravel deposits. This material is constantly being eroded and redeposited by the action of currents, waves, and storm events. The dynamic nature of the substrate maintains a variety of successional stages. Additionally, the porous nature of the substrate causes the water table to respond quickly to changes in lake level. As a result, natural communities occur as a complicated mosaic of different hydrologic conditions, seral stages, physiognomies, and floristic assemblages that shift over time.

In general, from the lake side of the sandspit, the "Great Lakes Region sparsely vegetated beach" occurs from the water's edge to the upper limit of winter storms. Moving inland, from the top of the foredune, usually one to three meters above the beach, a mosaic of the remaining four types generally occurs. Their placement and distribution depends on water levels, the stability of the substrate, and the length of time since a major storm event or other disturbance.

The dynamic nature of the system contributes greatly to its species diversity. Seedbanks associated with several of these community types may persist up to 100 years (Bier pers. communication). The persistence of the seedbank, in combination with the disturbance regime and variable hydrology, allows species or assemblages of species to persist at the complex level, even though local populations or examples of individual community types may disappear.

Range: Great Lakes Region.

Crosswalk: This complex is equivalent to a combination of Smith's (1991) "Great Lakes Region Beach
Community" and "Eastern Great Lakes Sand Plains" community types.

Selected references: Bissell and Bier 1987, Kline 1993.

Mesic till barrens complex- TNC's preserve at Long Pond, Monroe County. Photograph by Roger Earl Latham.

MESIC TILL BARRENS COMPLEX

Community types:

Pitch pine - rhodora - scrub oak woodland Rhodora - mixed heath - scrub oak shrubland

Description: This complex and the community types it contains are known only from the southern Pocono Plateau of Pennsylvania. Woodlands, shrublands and forests occur in a complicated mosaic on a fairly tight spatial scale. This system is unusual among barrens in that it is not the result of droughty soil conditions (Latham et al. 1996). It occurs mainly on deep, fine-loamy Illinoian age glacial till. The vegetation is a mixture of wetland plants and plants usually associated with xeric soil conditions.

The Pocono mesic till barrens are the most plant species-rich barren type in Pennsylvania, and contains the greatest concentration of globally rare plant and animal species of any terrestrial ecosystem in Pennsylvania (Davis et al. 1991). At least 30 regionally rare and 10 globally rare species occur on the barrens (Latham et al. 1996).

The barrens are dominated by ericaceous shrubs (dominantly *Rhododendron canadense, Kalmia angustifolia, Vaccinium angustifolium,* and *Gaylussacia baccata)* and *Quercus ilicifolia* (scrub oak), with scattered individuals or clumps of *Pinus rigida* (pitch pine). The dominant herbaceous species is *Pteridium aquilinum* (bracken). Mosses include *Polytrichum commune* and *Sphagnum* spp.

The processes responsible for the origin of the barrens, their persistence, and the spatial distribution of the community types are not known. The ecosystem dynamics of this complex are the focus of ongoing research. Preliminary findings indicate that the vegetation of the barrens may represent an alternative, relatively stable community state. Maintenance of this complex may depend on feedbacks between plants and environmental factors involving fire frequency, "frost pocket" microclimates, and the nitrogen dynamics of ericaceous plants and other sclerophylls (Petraitis and Latham 1998).

There are a number of other community types that appear to be closely associated with the types given here. In future versions of this classification, this complex may be expanded to include additional community types.

Range: Pocono Plateau.

Crosswalk: This complex is equivalent to Smith's (1991) "Mesic Scrub Oak-Heath-Pitch Pine Barrens."

Selected references: Davis et al.1991, Latham et al. 1996, Petraitis and Latham 1998.

Mesic till barrens complex- Fire at TNC's preserve at Long Pond, Photograph by Roger Earl Latham.

Serpentine Barrens Complex- Hershey Mill Barrens, Chester County. Photograph by Ann Rhoads

SERPENTINE BARRENS COMPLEX

Community types that characterize this complex*:

Serpentine pitch pine - oak forest
Serpentine Virginia pine - oak forest
Red-cedar - pine serpentine shrubland
Serpentine grassland
Serpentine gravel forb community
Serpentine seepage wetland

(*Note: Examples of this complex need not contain all of the community types listed.)

Description: This complex encompasses a distinctive pattern of vegetation occurring on predominantly Chrome-series soils overlaying serpentinite bedrock outcrops in southeastern Pennsylvania. Similar vegetation occurs on serpentinite outcrops throughout the Piedmont Upland of North America from New York to Georgia. The harsh chemistry of serpentine soils, in combination with a history of repeated fires and in some cases grazing, maintains a unique group of plant communities with a high concentration of plant and animal species of special concern.

The vegetation of the barrens is a mosaic of different physiognomies. There are forests dominated by oaks *(Quercus stellata, Q. marilandica)* and pine *(Pinus rigida, P. virginiana)* with an understory of *Smilax* spp. (greenbriar). There are open grasslands dominated warm-season (C_4) grasses such as *Schizachyrium scoparium* (little bluestem), *Andropogon gerardii* (big bluestem), *Sporobolus heterolepis* (prairie dropseed), and *Sorghastrum nutans* (Indian grass), with scattered trees and shrubs such as *Juniperus virginiana* (red-cedar), *Rhus copallina* (shining sumac), *R. glabra* (smooth sumac), and *Gaylussacia baccata* (black huckleberry). There are sparsely vegetated areas with little soil development dominated by forbs such as *Arabis lyrata* (lyre-leaved rock-cress), *Asclepius verticillata* (whorled milkweed), *Aster depauperatus*[S] (serpentine aster), *Cerastium arvense* var. *villosimum* (barrens chickweed), *Phlox subulata* ssp. *subulata* (moss-pink), *Talinum teretifolium*[S] (round-leaved fame-flower). There may also be small, groundwater-fed wetlands.

Serpentinite-derived soils have exceptionally low levels of nitrogen, phosphorus, potassium and calcium, high levels of nickel, chromium and cobalt and—perhaps most critically for plant growth and survival—a high magnesium/calcium ratio (Kruckelberg 1954). The unique character of the vegetation, the distribution of the different community types, and the high degree of endemism associated with serpentine barrens are apparently due to a combination of soil chemistry and disturbance factors.

Only a fraction (less than 10%) of the area of Pennsylvania's serpentinite outcrops currently supports barren vegetation. Deeper soils appear to reduce the influence of serpentine chemistry on plants to such an extent that areas with deepest soils support dry-mesic forests resembling those occurring on soils derived from non-serpentine rock types. On the barrens, community distribution is strongly correlated with soil depth (Dubinsky and Latham in prep.). The "Serpentine gravel -forb community" occurs on areas of thinnest soils and rock outcrops. It is in this community type that the majority of serpentine endemic plant species occur. Grasslands, shrubland and woodland vegetation occur on somewhat deeper soils, while forests occur on the deepest soils. Soil-reducing or soil-removing disturbance appears to be required to maintain the distinctive character of the barrens (Latham 1992).

Historical accounts of barrens fires, charcoal fragments and observation over the past 50 years of intensive fire control confirm that the barrens as first documented by Western botanists were fire-dependent systems (Latham 1992). Aerial photo documentation and verbal/historical account show that in the absence of fire, areas of rock outcrop, gravel, and extremely thin soil have steadily decreased. Herbaceous and woody species have begun to invade open areas from the edges, creating a more temperate environment by providing shade, reducing surface temperatures, adding organic material, facilitating soil development, and increasing moisture retention.

The presence of *Pinus virginiana* instead of the fire-adapted *P. rigida* on a barren can have far-reaching implications for the site's ecology and future vegetation. *P. virginiana* appears to facilitate soil development and the invasion of barrens by mesic species (Barton and Wallenstein 1998), while *P. rigida* resists it (Latham 1993). The mechanisms

behind this dynamic are not fully known. *P. virginiana* produces dense shade; this shade appears to limit or exclude the dense layer of *Smilax* spp. that characterizes the understory of *P. rigida* forests. *Smilax* spp. in turn limits or excludes seedling establishment by mesic tree species (Latham pers. communication). The flammability of *P. rigida* and its decay-resistant litter may help the species to resist invasion by reducing nitrogen availability and increasing fire return rate (Latham pers. communication).

Researchers in Pennsylvania and elsewhere are experimenting with a range of disturbance regimes in an attempt to restore and maintain the species and communities of concern that occur on serpentine barrens. Various combinations of cutting, soil disturbance and fire of various intensities, intervals, and seasonality are being applied on experimental plots on serpentine barrens throughout the Piedmont. See the literature section below for some sources current at the time of this writing. Consult the current literature and the Pennsylvania Field Office or the Pennsylvania Science Office of The Nature Conservancy for the latest developments in this area.

Range: In Pennsylvania, this complex is restricted to areas on and adjacent to outcrops of serpentine rock formations in the southeastern corner of Pennsylvania (Chester, Lancaster and Delaware counties) continuing into adjacent areas of Maryland and Delaware.

Crosswalk: This complex is equivalent to Smith's (1991) "Eastern Serpentine Barrens."

Selected references: Anderson 1971, Brooks 1987, Clupper 1991, Day 1953, Dorsey 1987, Dubinsky and Latham in prep., Kruckelberg 1954, Latham 1992, Miller 1977, Miller 1981, Smith 1988.

Serpentine Barrens Complex- Goat Hill Barrens, Chester County. Photograph by Tom Smith.

RIDGETOP ACIDIC BARRENS COMPLEX

Community types that characterize this complex*:

Pitch pine - scrub oak woodland
Pitch pine - mixed hardwood woodland
Pitch pine - heath woodland
Dry oak - heath woodland
(Red spruce rocky summit-rare)
Scrub oak shrubland
Low heath shrubland
Low heath - mountain ash shrubland
Little bluestem - Pennsylvania sedge opening

(*Note: Most of these community types also occur in other landscape settings. Examples of the complex need not contain all community types listed.**)**

Description: The "Ridgetop acidic barren complex" represents a group of open-canopy ridgetops and summits, which occur throughout central and northeastern Pennsylvania. This complex is found on high ridgetops and summits (1200-2200 ft), where low soil moisture, shallow soils, high wind velocities, frequent fires, and usually a history of cutting limit tree growth. Similar patterns continue into New York, New Jersey, Maryland, and southward along the Appalachian highlands. More information is needed to evaluate the variation in this complex across its range.

Ridgetop Acidic Barrens Complex- Broad Mountain Barrens, Carbon County. Photograph by Staff of the Pennsylvania Science Office of The Nature Conservancy.

Structurally, these areas contain a mosaic of physiognomic types, including woodlands, shrublands, and open grassy areas. Where trees become established, they are typically stunted, and in areas exposed to high winds, flagged. The bedrock geology in these areas may be sandstone, conglomerate, acidic shale, schist, gneiss, or quartzite. Soils are usually thin, well drained to excessively well-drained, and acidic. There may be extensive areas of unvegetated or sparsely vegetated bedrock outcrops. There may also be areas of bare soil.

The vegetation is dominated by oaks *(Quercus ilicifolia, Q. velutina, Q. montana, Q. coccinea)* and heaths

Ridgetop Acidic Barrens Complex- State Game Lands 57, Wyoming County. Photograph by Jean Fike

(Vaccinium angustifolium, V. pallidum, Gaylussacia baccata, Kalmia angustifolia), with or without pine *(Pinus rigida, P. strobus, P. virginiana, P. pungens).* A variety of other hardwood species *(Ater rubrum, Sassafras albidum, Betula lenta, Nyssa sylvatica, Populus tremuloides)* and non-ericaceous shrubs *(Comptonia peregrina, Aronia melanocarpa, Sorbus americana)* may also be present. The herbaceous layer is dominated by sedges, grasses, and bracken *(Pteridium aquilinum).* There is frequently an abundance of mosses and lichens; more information is needed on nonvascular species.

The arrangement of individual community types appears to be influenced by a combination of factors including elevation, soil depth, exposure, cutting history, fire history, and microclimate (the "frost pocket" phenomenon). In general, the physiognomy becomes more open at higher elevations and on southern exposures. Where fires are frequent, *Pinus rigida* (pitch pine) will typically be present. In the absence of fire, other pines *(P. strobus, P. virginiana, P. echinata, P. pungens)* may accompany or replace *P. rigida,* or pine may be absent altogether. Frost pockets may play a part in maintaining open areas; this is especially true of the "Little bluestem - Pennsylvania sedge opening" type. If fire is suppressed on these sites over the long term, their distinctive vegetation may gradually give way to more mesic species typical of the surrounding forests at lower elevations.

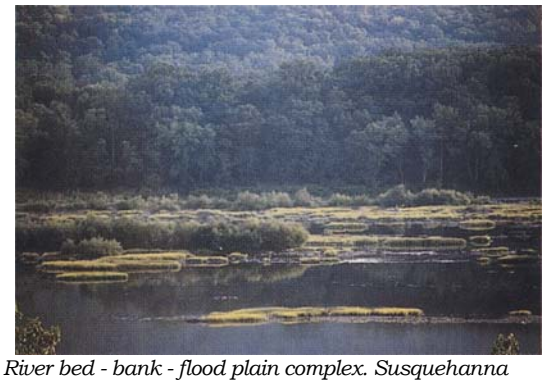
Two of the community types associated with this complex appear to be elevation-restricted in Pennsylvania. The "Low heath -mountain ash shrubland" type generally only occurs at elevations above 1900 ft. The "Red spruce rocky summit" type is known in Pennsylvania from only one site, with an elevation of about 2200 ft.

The forest types that most typically surround this complex are the "Dry oak - heath forest" and "Pitch pine - mixed oak forest," although a variety of other types may also occur.

Range: Glaciated NE, Pocono Plateau, Ridge and Valley, South Mountain, Unglaciated Plateau.

Crosswalk: This complex is roughly equivalent to a combination of Smith's (1991) "Ridgetop Dwarf-Tree forest" and "Northern Appalachian Acidic Rocky Summit' community types.

Selected references: Duppstadt 1972, Illick and Aughanbaugh 1930, McVaugh 1957, Olsvig 1979, PNDI field forms, Reschke 1990.



River bed - bank - flood plain complex. Susquehanna River, Dauphin County. Photograph by Jean Fike.

RIVER BED – BANK – FLOODPLAIN COMPLEX

Community types that characterize this complex*:

Sycamore - (river birch) - box elder floodplain forest
Silver maple floodplain forest
Red maple - elm - willow floodplain swamp
River birch - sycamore floodplain scrub
Black willow scrub/shrub wetland
Riverside ice scour community
Big bluestem - Indian grass river grassland
Water-willow - smartweed riverbed community

(***Note:** Examples of this complex will not usually contain all of the community types listed.)

Description:
This complex describes persistent emergent vegetation growing in or along rivers. It includes semi-permanently/seasonally flooded vegetation of the riverbed, banks and islands as well as temporarily flooded and saturated floodplain communities. This landscape is organized by severity and frequency of flooding, ice scour, direction of flow, and differences in substrate. Community types that are inundated for much of the growing season in most years are dominated by herbaceous vegetation (e.g. *Apocynum cannabinum, Justicia americana, Eleocharis* spp., *Cyperus* spp., *Polygonum* spp., *Bidens* spp.). Areas with less extensive periods of inundation, which are scoured by river ice in some years, are dominated by woody vegetation (e.g. *Betula nigra, Salix nigra, Platanus occidentalis),* which is maintained in an early successional stage by ice scour and flooding. Areas that are not subject to ice scour and are periodically inundated but remain dry for the majority of the year, support forest vegetation with a mixture of upland and wetland species. Floodplain sites where floodwaters are retained on site for longer periods of time or where additional hydrologic sources are present may support almost entirely wetland vegetation. Differences in disturbance regime, substrate, and hydrologic regime produces the great structural, community, and species diversity associated with this complex.

The community type with the longest typical period of inundation is the "Water-willow - smartweed riverbed community." This community type occurs on alluvium, mud or on riverbed rock where soil accumulates in crevices. It remains inundated for most of the year, but may become exposed during dry periods. In areas subject to flooding of lesser frequency and duration but still subject to ice scour, a variety of woody and herbaceous community types occur. On sand and gravel bars, and occasionally on rock outcrops with sand and silt accumulating in cracks in the rock, a tall grassland community, with or without scattered woody plants, the "Big bluestem - Indian grass river grassland" may be found. The "Riverside ice scour community" occurs on rock outcrops, and is characterized by a mixture of herbaceous and woody plants. The frequency and severity of ice scour and flooding in these two communities maintain their open aspect.

Along the riverbanks and on larger islands, where the disturbance regime is somewhat less severe, two woody community types—the "River birch - sycamore floodplain scrub" and the "Black willow scrub/shrub wetland" frequently occur. These two communities exist on a continuum with the "Big bluestem -Indian grass river grassland." In areas where disturbance is intermediate, the vegetation may be intermediate between types. Likewise, depending on flood and scour severity in recent years, woody plants may become established on, or be removed from a given site. This is a dynamic system, driven primarily by river levels.

In areas subject to still less prolonged and less frequent flooding, and not generally subject to ice scour, floodplain forests usually occur. The "Silver maple floodplain forest" and the "Sycamore -(river birch) - box elder floodplain forest" are dry throughout most of the year, but receive at least intermittent flooding. The "Red maple - elm - willow floodplain swamp" may be flooded with a frequency similar to that of the other two floodplain forest types, but it typically occurs in depressions, old oxbows, or behind natural levees. The landscape position of this community type prevents floodwaters from draining rapidly, and water is retained on the site for prolonged periods. These wetlands may also receive groundwater enrichment and/or surface water from adjacent uplands.

More information is needed to describe in greater detail the hydrology, landscape position and successional dynamics of the community types in this complex.

Range: Entire state, associated with major river systems.

Crosswalk: This complex is equivalent to a combination of Smith's (1991) "Floodplain Swamp," "River Gravel Community," and "Riverside Outcrop / Cliff Community" types.

Selected references: Cowardin et al. 1979, PNDI Field forms, Smith 1991.