Cotton-grass Poor Fen

System: Palustrine
Subsystem: Herbaceous
PA Ecological Group(s): Peatland Wetland

Global Rank: G3
State Rank: S3

General Description

This acidic herbaceous community occurs on temporarily flooded, semi-permanently flooded or saturated peat at relatively high elevations. Cotton-grass Poor Fens are often referred to as bogs, and in fact the degree of groundwater influence is variable and usually much lower than for other fen communities. They often occur in small-patches, and occupy flat-lying land (0- to 1-degree slopes) in headwater basins. Bedrock is sometimes exposed in places, creating a mosaic that includes dry patches with lowbush blueberry (*Vaccinium angustifolium*), certain lycopods (especially *Lycopodium clavatum* and *Diphasiastrum digitatum*), and other upland species. The community is typically dominated by a combination of tawny cotton-grass (*Eriophorum virginicum*), sedge (*Carex folliculata*), soft rush (*Juncus effusus*), narrow-panicled rush (*Juncus brevicaudatus*), and cinnamon fern (*Osmunda cinnamomea*). Other herbaceous species may include sedge (*Carex trisperma*), round-leaved sundew (*Drosera rotundifolia*), wool-grass (*Scirpus cyperinus*), and white beak-rush (*Rhynchospora alba*).

Older stands typically occur over shallow bedrock, where they are kept open by high water tables. Younger stands often occur in beaver-influenced wetland mosaics, often behind breached dams on the site of former beaver ponds. The type also occurs as a successional community on formerly forested peatlands that have been logged and/or burned within the last century. Hummock and hollow microtopography can be moderately well-developed, and bedrock is typically acidic sandstone and, less commonly, shale. The substrate is poorly to very poorly drained peat or muck. Peat deposits are shallow, ranging from 10-75 cm in depth, underlain by clay-rich soils or bedrock.

Rank Justification

Vulnerable in the jurisdiction due to a restricted range, relatively few populations, recent and widespread declines, or other factors making it vulnerable to extirpation.

Identification

- Saturated for much or most of the year, usually wet and springy to the touch.
- High cover of peat (*Sphagnum* spp.) or haircap (*Polytrichum* spp.) moss.
- Tawny cotton-grass (*Eriophorum virginicum*) present, co-dominant at least in patches.
- Occurs in high-elevation headwaters basins of non-glaciated regions, often where bedrock is shallow
- Peat layer may be shallow (ranging 10 – 75 cm).
- Woody vegetation is rare or absent

Characteristic Species

Shrubs

- Highbush blueberry (*Vaccinium corymbosum*)
- Chokeberries (*Photinia* spp.)

Herbs

- Tawny cotton-grass (*Eriophorum virginicum*)
- Sedge (*Carex folliculata*)
- Sedge (*Carex trisperma*)
- Soft rush (*Juncus effusus*)
- Cinnamon fern (*Osmunda cinnamomea*)
- Northern bog clubmoss (*Lycopodiella inundata*)
- Round-leaved sundew (*Drosera rotundifolia*)
- Wool-grass (*Scirpus cyperinus*)
- White beak-rush (*Rhynchospora alba*)

Bryophytes

- *Sphagnum* spp.
- *Polytrichum* spp.

International Vegetation Classification Associations:

Cottongrass Bog (CEGL006570)

NatureServe Ecological Systems:

High Allegheny Wetland (CES202.069)

Origin of Concept

Fike, J. 1999. Terrestrial and palustrine plant communities of Pennsylvania. Pennsylvania Natural Diversity Inventory. Harrisburg, PA. 86 pp.

Pennsylvania Community Code

na : Not Available

Similar Ecological Communities

The Sphagnum – Beak-rush Peatland community occurs in glaciated areas of Pennsylvania. Although sphagnum (*Sphagnum* spp.), tawny cotton-grass (*Eriophorum virginicum*), and beak rush species (*Rhynchospora* spp.) are important in both types, they differ in the overall species composition and in the environmental setting with the Cotton-grass Poor Fen being heavily dominated by tawny cotton-grass (*Eriophorum virginicum*) and rushes (*Juncus* spp.) and Sphagnum – Beak-rush Peatland being dominated by white beak-rush (*Rhynchospora alba*). Degraded Sphagnum – Beak-rush Peatland may occur as Cotton-grass Poor Fens.

Fike Crosswalk

None. This type is new to the Pennsylvania Plant Community Classification developed from PNHP inventory studies.

Conservation Value

The wetlands that Cotton-grass Poor Fens are a part of host a unique assemblage of plant and animal species, including some rare plants and insects such as the creeping snowberry (*Gaultheria hispidula*), bog sedge (*Carex paupercula*), northern pygmy clubtail (*Lanthus parvulus*), ocellated darner (*Boyeria grafiana*), ski-tailed emerald (*Somatachlora elongata*), Appalachian jewelwing (*Calopterysx angustipennis*), and superb jewelwing (*Calopteryx amata*).

Threats

Alteration to the hydrological regime such as impoundments, diking, draining, and beaver dams can lead to habitat destruction and/or shifts in community function and dynamics. However, beaver have been a

part of these ecosystems, thus many of the component species of this community are adapted to the cyclical community shifts caused by beaver. Clearing and development of adjacent land can lead to an accumulation of agricultural run-off and pollution as well as sedimentation.

Management

A natural buffer should be maintained around wetlands in order to minimize nutrient runoff, pollution, and sedimentation. Buffer design should consider factors such as the slope of adjacent lands, soil erosion potential, the migration distance of amphibians and insect species using the wetlands, and the condition of surrounding vegetation. Direct impacts and habitat alteration should be avoided (e.g., roads, trails, filling of wetlands) and low impact alternatives (e.g., elevated footpaths, boardwalks, bridges) should be utilized in situations where accessing the wetland can not be avoided. Care should also be taken to control and prevent the spread of invasive species within the wetland.

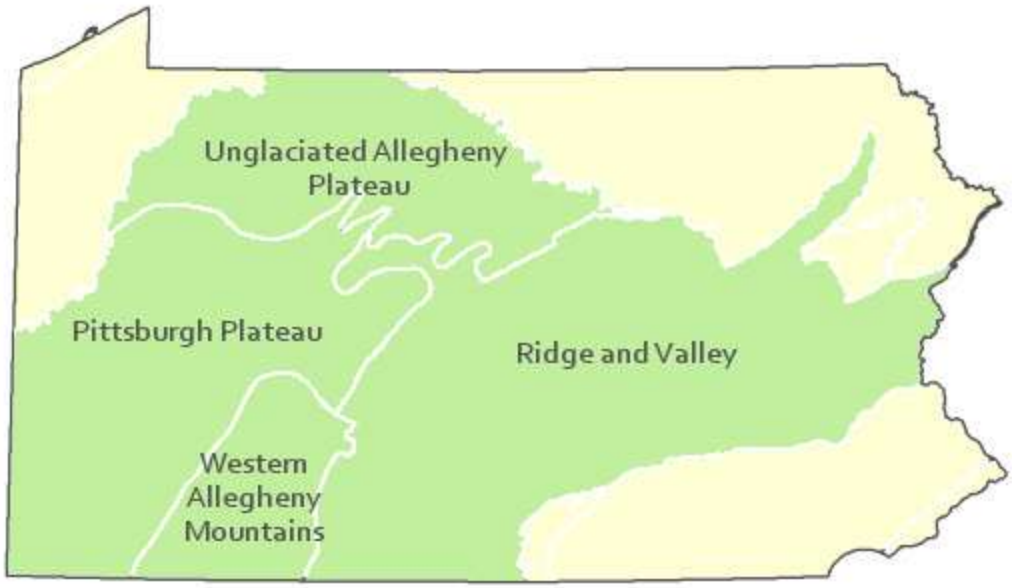
Research Needs

The process of succession in these wetlands, which may maintain the Cotton-grass Poor Fen over time or result in natural transition to shrub or forest wetlands, is also not well understood. It is important to understand the impact of fire, logging, and changes in beaver population density on the successional process.

Trends

While this is considered a naturally occurring wetland community, occurrences of Cotton-grass poor fen communities expanded following extensive logging and fires that occurred in the late 19th and early 20th centuries that impacted most forested wetlands. The almost complete extirpation of the beaver in central Pennsylvania in the late 19th century, and its subsequent population recovery in the second half of the 20th century, also contributed to the number of occurrences and extent of these wetlands. It is known generally that fire, logging, and beaver activity can all influence water levels and plant community structure in wetlands, changing the suitability of the wetland as habitat for many species. However, the full effects and long term impacts of these changes are not known.

Range Map



Pennsylvania Range

Central Pennsylvania – high elevations in the ridge and valley, Allegheny Mountains, and high Allegheny plateau physiographic provinces.

Global Distribution

Maryland, Pennsylvania, and West Virginia.

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