Sedge – Mixed Forb Fen

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

Global Rank: GNR
State Rank: S1

General Description

These are open, sedge-dominated wetlands that usually occur on organic substrate (sedge peat), saturated throughout most of the year by base-rich groundwater. These sites usually lack the distinct seepage areas associated with other fen types. Sedge species dominate, including prairie sedge (*Carex prairea*), Atlantic sedge (*Carex sterilis*), and/or sedge (*Carex tetanica*). Other species may include mountain-mint (*Pycnanthemum virginianum*), blue vervain (*Verbena hastata*), starry false Solomon's-seal (*Maianthemum stellatum*), common cat-tail (*Typha latifolia*), willow-herb (*Epilobium leptophyllum*), bedstraw (*Galium tinctorium*), sensitive fern (*Onoclea sensibilis*), jewelweed (*Impatiens capensis*), swamp thistle (*Cirsium muticum*), and Greek valerian (*Polemonium reptans*).

Rank Justification

Critically imperiled in the jurisdiction because of extreme rarity or because of some factor(s) such as very steep declines making it especially vulnerable to extirpation from the jurisdiction.

Identification

- Presence of calcareous indicator plant species such as Atlantic sedge (*Carex sterilis*), sedge (*Carex tetanica*), and mountain-mint (*Pycnanthemum virginianum*)
- Peat is usually present.

- Dominance of grass-like plants
- Surface water pH is between 6.0 and 7.9 during the growing season.

Characteristic Species

Herbs

- Prairie sedge (*Carex prairea*)
- Atlantic sedge (*Carex sterilis*)
- Wood's sedge (*Carex tetanica*)
- Mountain-mint (*Pycnanthemum virginianum*)
- Blue vervain (*Verbena hastata*)
- Starflower (*Maianthemum stellatum*)
- Common cat-tail (*Typha latifolia*)
- Willow-herb (*Epilobium leptophyllum*)
- Bedstraw (*Galium tinctorium*)
- Sensitive fern (*Onoclea sensibilis*)
- Jewelweed (*Impatiens capensis*)
- Swamp thistle (*Cirsium muticum*)
- Spreading Jacob's-ladder (*Polemonium reptans*)
- Baltic rush (*Juncus arcticus* var. *littoralis*)
- Spotted joe-pye-weed (*Eutrochium maculatum*)

Exotic Species

- Common reed (*Phragmites australis* ssp. *australis*)

International Vegetation Classification Associations:

Prairie Sedge - Tussock Sedge Fen (CEGL006551)

NatureServe Ecological Systems:

North-Central Appalachian Seepage Fen (CES202.607)

Origin of Concept

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

Pennsylvania Community Code

HO : Open Sedge (Carex Stricta, C. Prairea, C. Lacustris) Fen

Similar Ecological Communities

The Sedge – Mixed Forb Fen is distinguished from other groundwater-fed community types by presence of calciphilic species, shrub cover, or landscape position. Other basin-fen types fed by calcium-rich groundwater include the Poison Sumac - Red-cedar - Bayberry Fen and Alder-leaved Buckthorn – Inland Sedge – Golden Ragwort Shrub Fen, which differ from the Sedge – Mixed Forb Fen in that they exhibit a significantly higher shrub-cover. The Sedge – Mixed Forb Fen type, which is found primarily in basins or depressions, differs in landscape position from the Great Lakes Bluff Seep and River Bluff Seep, most often found on nearly vertical walls of tributary gorges and lake bluffs and This type is distinquished from the “poor fens” (Many-Fruited Sedge – Bladderwort Poor Fen, Cotton-grass Poor Fen) and other acidic peatlands by the presence and sometimes dominance of calciphilic species such as prairie sedge (*Carex prairea*), Atlantic sedge (*Carex sterilis*), sedge (*Carex tetanica*), and mountain-mint (*Pycnanthemum virginianum*). Tussock Sedge Marsh is strongly dominated by tussock sedge (*Carex stricta*). Bluejoint – Reed Canary-grass Marsh may contain tussock sedge, but it is dominated by bluejoint (*Calamagrostis canadensis* var. *canadensis*) and co-dominated by reed canary-grass (*Phalaris arundinacea*).

Fike Crosswalk

Open sedge (*Carex stricta, C. prairea, C. lacustris*) fen

Conservation Value

The Sedge – Mixed Forb Fen occurs in calcareous wetlands, which are especially unusual in Pennsylvania, where the predominant geology in most regions is acidic. There are a number of plants, aquatic invertebrates, and lepidopterans adapted specifically to this high-pH wetland habitat. Plants of special concern in Pennsylvania found in this habitat include prairie sedge (*Carex prairea*), sedge (*Carex tetanica*), and Schweinitz' sedge (*Carex schweinitzii*). These wetlands are irreplaceable, as their specific environmental conditions have formed over hundreds or thousands of years.

Threats

The greatest threats to these communities are disruptions to bedrock or glacial deposits such as drilling or mining in nearby areas and groundwater extraction, which can contaminate or alter the flow patterns of the groundwater that feeds the seepage. Groundwater pollution can also occur from improperly installed septic systems, from improperly lined underground waste disposal, and in agricultural areas,

from infiltration of pesticides, fertilizer, and bacteria from animal wastes. Invasive plant species, such as common reed (*Phragmites australis* ssp. *australis*), can threaten the biological integrity of the community. Wetland soils and vegetation are sensitive and will be damaged by foot traffic or recreational vehicles as they are easily compacted.

Management

Drilling, mining, or other disruptions to bedrock or glacial deposits should not be undertaken within half a mile of a seepage wetland without a thorough understanding of bedrock layers and groundwater flows. Groundwater flow patterns do not always mirror surface watersheds, and in some cases aquifers may be contiguous over large areas. Seepage wetlands are also sensitive to trampling and other physical disturbance from recreational activities; trails should be sited away from the wetland, or elevated structures employed to prevent traffic in the wetland. A natural buffer around the wetland should be maintained in order to minimize nutrient runoff, pollution, and sedimentation. The potential for soil erosion based on soil texture, condition of the adjacent vegetation (mature forests vs. clearcuts), and the topography of the surrounding area (i.e., degree of slope) should be considered when establishing buffers. The buffer size should be increased if soils are erodible, adjacent vegetation has been logged, and the topography is steep as such factors could contribute to increased sedimentation and nutrient pollution. These wetlands may require periodic disturbance, such as burning or grazing, to maintain their open canopy which is indicative of the Sedge – Mixed Forb Fen and the rare species that occupy the community.

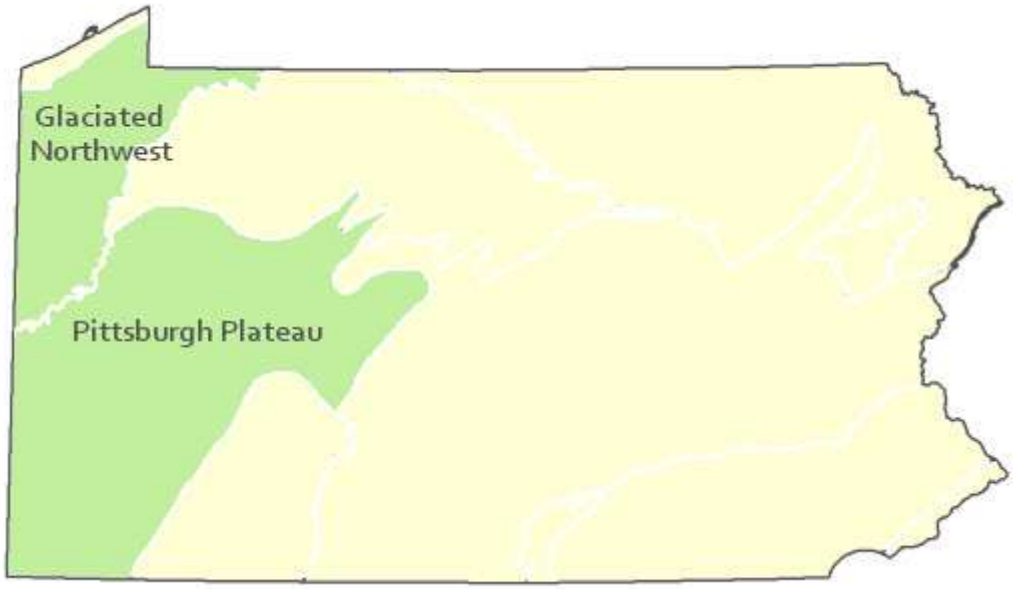
Research Needs

More site inventory and classification work is needed to refine the definition of this community type and resolve its relationship to other types. It appears that some of these wetlands will succeed to shrubland if not maintained. Management of these wetlands would be informed by an understanding of natural successional pathways, and of the historical frequency of disturbances such as fire and grazing in these wetlands.

Trends

Specific information on the loss and degradation of the Sedge – Mixed Forb Fen community is not available. However, most calcareous soils in Pennsylvania occur in valleys or glaciated regions that are also favorable for agriculture and settlement, and have been extensively cleared of natural vegetation for these purposes. Thus Sedge – Mixed Forb Fen wetlands, always few in number in Pennsylvania, are likely to have been lost or altered at a disproportionately high rate to other wetland types.

Range Map



Pennsylvania Range

NW and SW PA

Global Distribution

Pennsylvania

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