

## Serpentine Seep



**System:** Palustrine

**Subsystem:** Herbaceous

**PA Ecological Group(s):** Seepage Wetland

**Global Rank:** GNR

**State Rank:** S1

### General Description

This community type is restricted to areas underlain by serpentinite bedrock. Seeps occur on gentle slopes at the base of low hills and are adjacent to streams or may be stream headwater areas. Groundwater enriched with magnesium and various heavy metals (i.e., chromium and nickel) saturates the surface for a substantial portion of the growing season. Graminoids dominate; tufted hairgrass (*Deschampsia cespitosa*), rice cutgrass (*Leersia oryzoides*), spike-rush (*Eleocharis tenuis* var. *pseudoptera*), and deer-tongue grass (*Dichanthelium clandestinum*) are common. Other species that are characteristic of these seeps include straw-colored nutsedge (*Cyperus strigosus*), muhly (*Muhlenbergia mexicana*), swamp thistle (*Cirsium muticum*), smartweeds (*Polygonum* spp.), bugleweed (*Lycopus uniflorus*), a moss (*Philonotis capillaris*), Indian-grass (*Sorghastrum nutans*), whip-grass (*Scleria triglomerata*), purple gerardia (*Agalinis purpurea*), American burnet (*Sanguisorba canadensis*), and boneset (*Eupatorium perfoliatum*). This community type is part of the serpentine barrens complex.

### 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.

### Identification

- Groundwater seep areas of low slope (1-3 degrees) and variable aspect

- Soils are typically very wet thin sapric peats (muck) (saturated) and clay loams derived from serpentine bedrock
- Soil depth is generally greater than 30 cm and can exceed 60 cm
- Only occurs on serpentinite bedrock
- Dominated by grasses and rushes such as tufted hairgrass (*Deschampsia cespitosa*), rice cutgrass (*Leersia oryzoides*), spike-rush (*Eleocharis tenuis* var. *pseudoptera*), and deer-tongue grass (*Dichanthelium clandestinum*)

### Characteristic Species

#### Herbs

- [Tufted hairgrass \(\*Deschampsia cespitosa\*\)](#)
- [Rice cutgrass \(\*Leersia oryzoides\*\)](#)
- [Slender spike-rush \(\*Eleocharis tenuis\* var. \*pseudoptera\*\)](#)
- [Deer-tongue grass \(\*Dichanthelium clandestinum\*\)](#)
- [False nutsedge \(\*Cyperus striqosus\*\)](#)
- [Muhly \(\*Muhlenbergia mexicana\*\)](#)
- [Swamp thistle \(\*Cirsium muticum\*\)](#)
- [Smartweeds \(\*Persicaria\* spp.\)](#)
- [Bugleweed \(\*Lycopus uniflorus\*\)](#)
- [Indian-grass \(\*Sorghastrum nutans\*\)](#)
- [Whip-grass \(\*Scleria triglomerata\*\)](#)
- [False-foxglove \(\*Aqalinis purpurea\*\)](#)
- [American burnet \(\*Sanguisorba canadensis\*\)](#)
- [Boneset \(\*Eupatorium perfoliatum\*\)](#)

#### Bryophytes

- [a moss \(\*Philonotis capillaris\*\)](#)

### International Vegetation Classification Associations:

[Serpentine Emergent Wetland](#) (CEGL006316)

## **NatureServe Ecological Systems:**

[Eastern Serpentine Woodland](#) (CES202.347)

### **Origin of Concept**

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

### **Pennsylvania Community Code**

HE : Serpentine Seepage Wetland

### **Similar Ecological Communities**

This community is distinguished from other types of seeps primarily by its landscape context. This type occurs exclusively in areas underlain by serpentinite bedrock and influenced by groundwater rich in calcium, magnesium, chromium, nickel, and iron.

### **Fike Crosswalk**

Serpentine Seepage Wetland

### **Conservation Value**

This community is rare in the state and serves as important habitat for reptile and amphibian species such as wood frogs (*Rana sylvatica*), spotted salamander (*Ambystoma maculatum*), marbled salamander (*Ambystoma opacum*), and Jefferson salamander (*Ambystoma jeffersonianum*).

### **Threats**

Alteration to the hydrological regime and development are the major threats to this community and can lead to habitat destruction and/or shifts in community function and dynamics. Clearing and development of adjacent land can lead to an accumulation of agricultural run-off and pollution, and sedimentation. This community is limited to areas where serpentine bedrock is near the surface, resulting in a limited range of potential habitats.

### **Management**

Extraction, drilling, mining, or other activities that impact the bedrock or flow of groundwater should not be undertaken within half a mile of a seepage wetland without a thorough understanding of bedrock layers and groundwater flows. 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. 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.

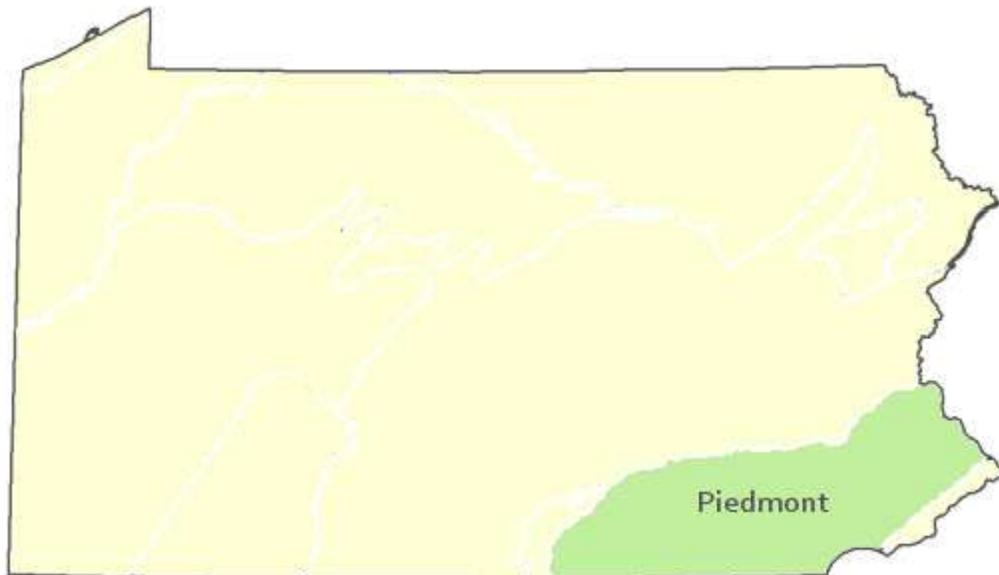
### **Research Needs**

There is a need to collect plot data to characterize variations and guide further classification of this community.

### **Trends**

The general trend has been decline as many of the smaller serpentine barrens have been lost to development and agriculture. Most extant occurrences are likely on protected public or private lands and are relatively secure.

### **Range Map**



### **Pennsylvania Range**

Southeastern Pennsylvania.

### **Global Distribution**

Pennsylvania, possibly in Maryland.

### **References**

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NatureServe 2010. NatureServe Explorer: An online encyclopedia of life Version 7.1. NatureServe, Arlington, VA. Available <http://www.natureserv.org/explorer> (accessed: 23 November 2011).

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Pennsylvania Department of Conservation and Natural Resources (DCNR). 1999. Inventory Manual of Procedure. For the Fourth State Forest Management Plan. Pennsylvania Bureau of Forestry, Division of Forest Advisory Service. Harrisburg, PA. 51 ppg.