Calcareous Fens of SE MN

Technical Workshop
June 18 & 19, 2004

Goals

- Reach a common understanding of the nature of calcareous fens
- Examine case studies of management decisions involving the sustainability of calcareous fens
- Discuss the future of calcareous fen management in the face of rapid urbanization

Field Visit

- Things that made sense in the conference room might not seem so easy in the field
- Complicated relationships are sometimes much easier to comprehend in nature.
- We'll try our hand at checking each of the four characteristics that comprise the "Technical Criteria"

Natural Community

Wetlands with high botanical diversity

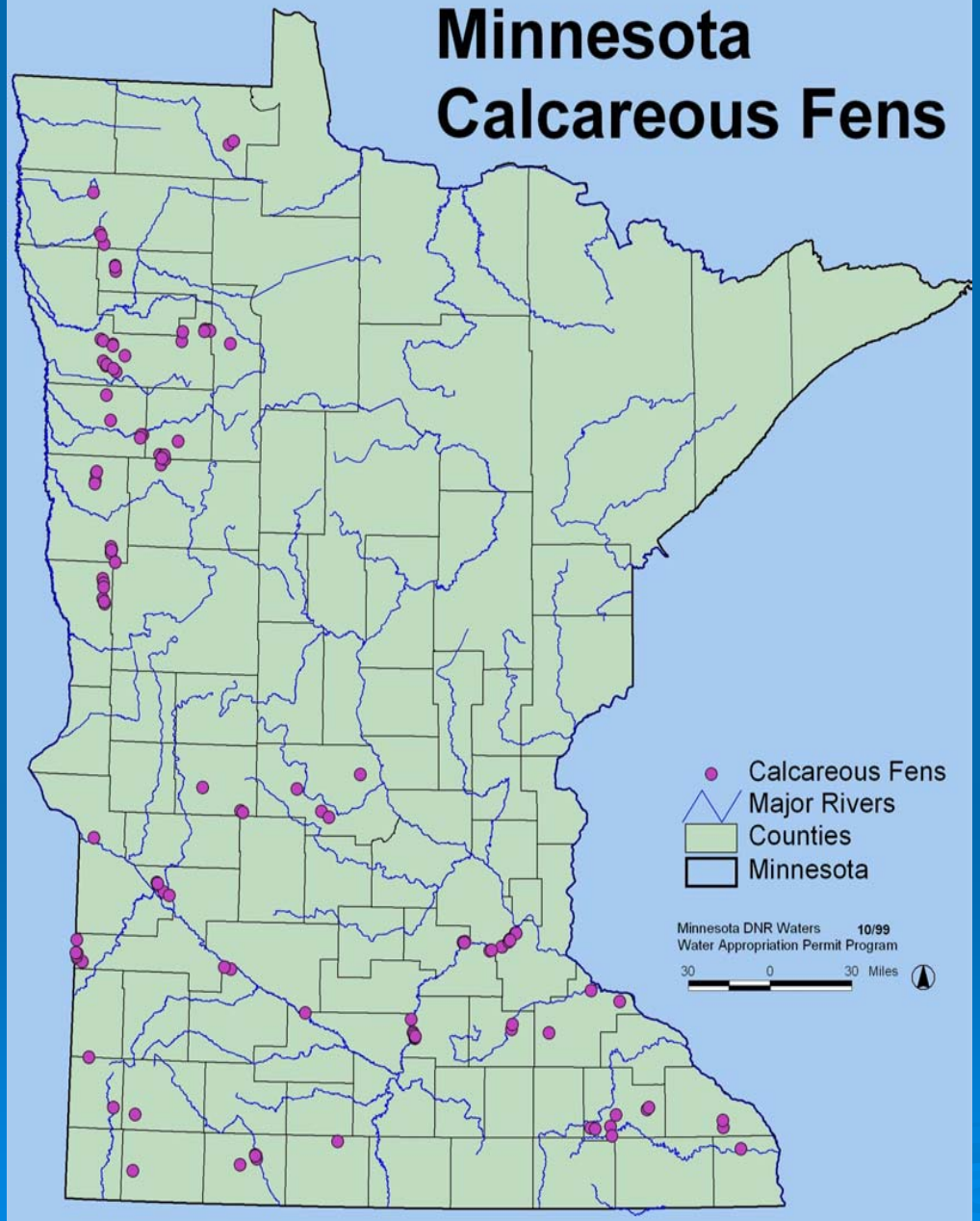
Sustained by inflows of ground water

Not flooded but always wet

Organic matter accumulates

Locations

Calcareous fens occupy uncommon positions in the landscape where climate, geologic deposits, and landforms allow substantial discharge of ground water typically bearing enough $CaCO_3$ to precipitate within the soil profile.


Minnesota
Calcareous Fens
Calcareous Fens
Major Rivers
Counties
Minnesota
Minnesota DNR Waters 10/99
Water Appropriation Permit Program
30 0 30 Miles

Calcareous Seepage Fen is an open sedge and rush community that occurs throughout Minnesota. The ground layer is usually dominated by Carex lasiocarpa, Carex sterilis, Rhynchospora capillacea, Eleocharis rostellata and Scirpus cespitosus. Muhlenbergia glomerata, Parnassia glauca and Lobelia kalmii are often present as are Betula pumila, Salix candida, and Potentilla fruticosa

Minnesota's Native Vegetation: A Key to Natural Communities. 1991, 1993

…occur on shallow or deep peaty soils

…areas of calcareous ground water discharge

…circumneutral

…high concentrations of dissolved salts often forming a visible marl precipitate

…low in oxygen

…rare vascular plants and bryophytes

Wetlands Conservation Act, 1991

Calcareous fens may not be drained or filled or otherwise altered or degraded except as provided for in a management plan approved by the commissioner.

Minnesota Statute 103G.223

What is a calcareous fen?

Legally defined in Minnesota Rules 8420.1020:

A calcareous fen is a peat-accumulating wetland dominated by distinct ground water inflows having specific chemical characteristics. The water is characterized as circumneutral to alkaline, with high concentrations of calcium and low dissolved oxygen content. The chemistry provides an environment for specific and often rare hydrophytic plants.

Technical Criteria

Peat Soil

- Histosol or a soil with a histic epipedon.

Vegetation

- Compile points from a calciphile list, or
- Determine that calciphiles dominate

Technical Criteria

Hydrology

- Upwelling groundwater inflows are sufficient to maintain saturation for the development of a histosol or a soil with a histic epipedon.

Geochemistry

- Upwelling groundwater is typically oxygen-poor, cold, and contains dissolved nutrients, especially calcium.

Summary Articles

- Amon et al. 2002. Temperate Zone Fens of the Glaciated Midwestern USA. Wetlands 22(2)301-317.
- Bedford and Godwin. 2003. Fens of the United States: Distribution, Characteristics, and Scientific Connection Versus Legal Isolation. Wetlands 23(3)608-629