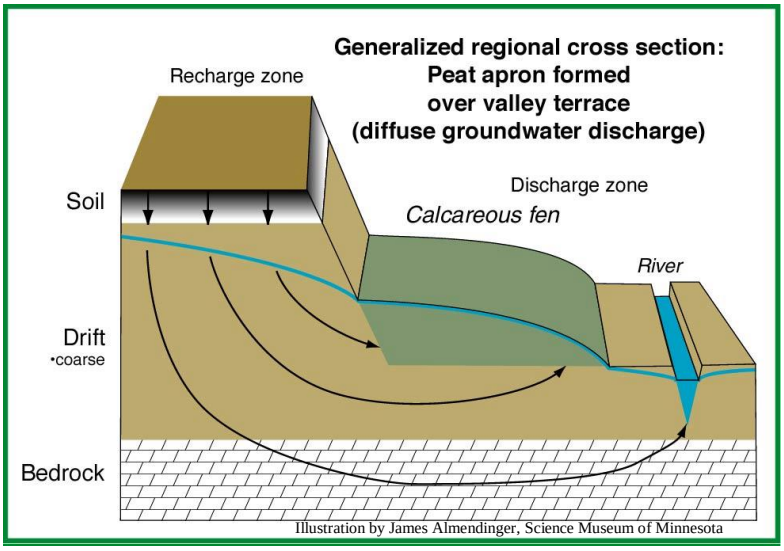
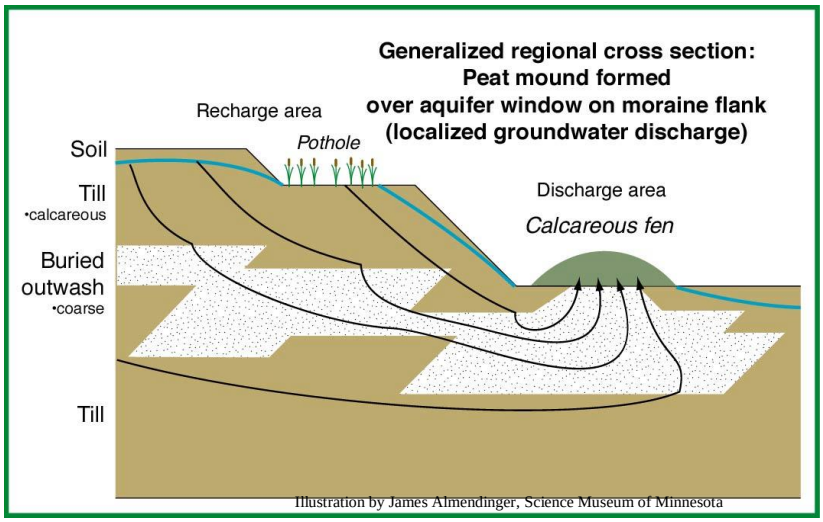
Fact Sheet

WHAT IS A CALCAREOUS SEEPAGE FEN?



Calcareous fens are rare and distinctive wetlands characterized by a substrate of non-acidic peat and dependent on a constant supply of cold, oxygen-poor groundwater rich in calcium and magnesium bicarbonates. This calcium-rich environment supports a plant community dominated by "calciphiles," or calcium-loving species. These fens typically occur on slight slopes where upwelling water eventually drains away and where surface water inputs are minimal. Sometimes they occur as domes of peat that grow to the height of the hydraulic head. These settings create an unusual wetland regime where the substrate is almost always saturated to the surface, but flooding is rare and brief. Shallow pools of water in which marl precipitates are typically present surrounded by low, tussocky, grass- and sedge-dominated vegetation. The substrate is springy or quaking underfoot. The figures above and below illustrate the geologic features and groundwater flows that lead to the formation of calcareous seepage fens.

HOW RARE ARE CALCAREOUS SEEPAGE FENS?



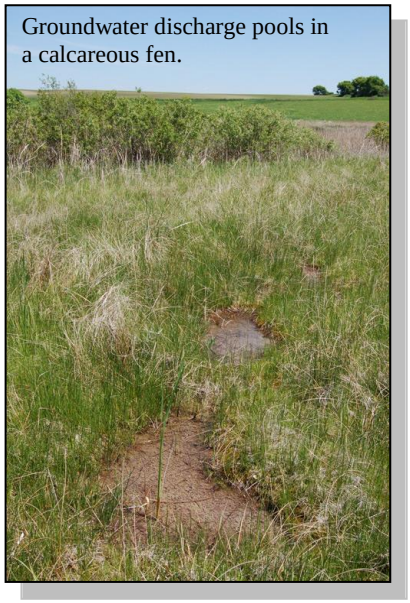
Calcareous seepage fens are one of the rarest natural communities in the United States. These fens have been reported from 10 states, mostly in the Midwest. Approximately 200 are known in Minnesota, most of which are only a few acres in extent. They are concentrated at the bases of terrace escarpments in river valleys in southeastern Minnesota, on the sides of morainal hills and valley sideslopes in southern and west-central Minnesota, and on the downslope side of beach ridges in the Glacial Lake Agassiz basin in the northwest. There are also a few in northern Minnesota where upwelling groundwater reaches the surface within large, more acidic peatlands.

WHY ARE CALCAREOUS SEEPAGE FENS PROTECTED?

In addition to the rarity of the community itself, calcareous seepage fens support a disproportionately large number of rare plant species in Minnesota, four of which (*) occur almost exclusively in this community. Eight state-listed, rare plant species are known from calcareous seepage fens:

*Carex sterilis**	Sterile sedge	State threatened
*Cladium mariscoides**	Twig-rush	State special concern
*Rhynchospora capillacea**	Fen beak-rush	State threatened
*Fimbristylis puberula**	Hairy fimbristylis	State endangered
Scleria verticillata	Nut-rush	State threatened
Eleocharis rostellata	Beaked spike-rush	State threatened
Valeriana edulis	Valerian	State threatened
Cypripedium candidum	Small white lady's slipper	State special concern

Calcareous seepage fens are highly susceptible to disturbance. Reduction in the normal supply of groundwater results in oxidation of the surface peat, releasing nutrients and fostering the growth of shrubs and tall, coarse vegetation that displaces the fen plants. Nitrogen-rich surface water runoff into fens promotes the invasion of aggressive exotic plants, especially reed canary grass, that also outcompete the fen plants. Flooding drowns the fen plants. The soft, saturated character of the peat makes almost any level of activity within them, by humans or domestic livestock, highly disruptive.



Groundwater discharge pools in a calcareous fen.

HOW ARE CALCAREOUS SEEPAGE FENS PROTECTED?

Under the Minnesota Wetlands Conservation Act (WCA), impacts to calcareous seepage fens are regulated by the Department of Natural Resources. According to the WCA, calcareous fens may not be filled, drained, or otherwise degraded, wholly or partially, by any activity, unless the commissioner of natural resources, under an approved management plan, decides some alteration is necessary (Minn. Statutes 103G.223).

In addition to the protection afforded by the WCA, destruction of any state-threatened plants occurring on a calcareous fen may be regulated under Minnesota's endangered species law (Minn. Statutes 84.0895). For additional information, see the DNR website at:
http://www.dnr.state.mn.us/ets/index.html.

The DNR maintains a list of known calcareous fens, which is available at the DNR's website at:
http://files.dnr.state.mn.us/publications/waters/calcareous_fen_list_nov_2009.pdf
Landowners or others proposing activities that may affect a calcareous fen or that are interested in protecting or managing a calcareous fen should contact the DNR, Ecological and Water Resources Division at 651-259-5125.