



Calcareous Sloping Fen

Community Code: CP2BOA1000

State Rank: S2



Concept: Open, sedge-dominated wetlands occurring on slight to moderate slopes where there is calcareous groundwater seepage. Calcareous Sloping Fens are the most calcium- and species-rich of the three calcareous fen communities described in Massachusetts. They are rare species "hot spots" with many associated rare plant and animal species.

Environmental Setting: Calcareous Sloping Fens are generally small, open, graminoid- and herbaceous-dominated wetlands, which may occur as multiple patches in a wetland or in wetland complexes with other wetland community types. They are on (or at the base of) shallow to moderate slopes and maintained by circumneutral to alkaline (pH 6.0-8.1) groundwater seepage, with high concentrations of calcium and magnesium cations and bicarbonate anions dissolved from nearby bedrock or glacial materials. Seepage may be visible as distinct rivulets. Where there is heavy groundwater discharge, the mineral soil is exposed with organic matter accumulations in small hummocks. Calcareous Sloping Fens have a shallower depth of organic matter than other types of calcareous fens due to more rapid and aerated groundwater flow. Some form of disturbance is important to preventing dominance by woody species.

Vegetation Description: Calcareous Sloping Fens are dominated by sedges, such as prickly sedge (*Carex interior*), delicate sedge (*C. leptalea*), yellow sedge (*C. flava*), tussock sedge (*C. stricta*), marsh sedge (*C. lacustris*) and porcupine sedge (*C. hystericina*), and grasses, including marsh muhly (*Muhlenbergia glomerata*) and fowl mannagrass (*Glyceria striata*). Herbaceous species include Kalm's lobelia (*Lobelia kalmii*), water-horehound (*Lycopus uniflorus*), grass-of-Parnassus (*Parnassia glauca*),



rough-leaved goldenrod (*Solidago patula*), fen-goldenrod (*S. purshii*), and marsh fern (*Thelypteris palustris* var. *pubescens*). Shrubby cinquefoil (*Dasiphora floribunda*) is almost always present in a low shrub layer, sometimes with the native alder-leaf buckthorn (*Rhamnus alnifolia*). A sparse, and generally low, canopy layer may include white pine (*Pinus strobus*), larch (*Larix laricina*), red maple (*Acer rubrum*), and alders (*Alnus incana* spp. *rugosa*, *A. serrulata*), with shrubby autumn, hoary, and silky willow (*Salix serissima*, *S. candida*, and *S. sericea*) along the margins. There is often a bryophyte layer, dominated by sphagnum moss species, though moss cover is generally less in sloping fens than other fens. Calcareous Sloping Fens may occur as openings at the bases of slopes, in upland forests or swamps, or may grade into more open wetlands downslope.

Differentiating Occurrences: All calcareous wetlands include shrubby cinquefoil (*Dasiphora floribunda*). Most also have other calciphiles (calcium-loving plants) such as grass-of-parnassus (*Parnassia glauca*), Kalm's lobelia (*Lobelia kalmii*), alder-leaf buckthorn (*Rhamnus alnifolia*), hemlock parsley (*Conioselinum chinense*), autumn and hoary willows (*Salix serissima* and *S. candida*), and slender cotton-grass (*Eriophorum gracile*). Within a given site, calcareous fen communities grade from one to another as conditions change. Calcareous Sloping Fens are on shallow to moderate slopes and have more mineral soil than other calcareous fens; peat is mostly restricted to sedge hummocks. A diverse herbaceous layer dominates the vegetation. Tall shrubs and short trees may occur in scattered patches. Nutrients arrive as seepage from uplands through mineral soil. Calcareous Seepage Marshes have a mixture of herbaceous, graminoid and shrub species similar to an emergent marsh, with peat generally 0.5 to 2m deep. They are generally flat but may be slightly sloping. Calcareous Basin Fens are peatlands with deep organic soil > 2.0 meters (6.5 ft.). They are dominated by sedges with a sparse shrub layer and generally contain a more developed bryophyte layer than the other calcareous fens. They form in basins (best observed away from the edges). They share many species with acidic fens, but include some species restricted in Massachusetts to calcareous conditions, such as bog birch and some of the calciphiles listed above. Red Maple - Black Ash - Tamarack Calcareous Seepage Swamps are dominated by trees and tall shrubs in a somewhat sparse forest where small openings share many of the species and conditions of Calcareous Sloping Fens. They may abut Calcareous Sloping Fens in a wetland mosaic.

Associated Fauna: Calcareous sloping fens can function as vernal pool habitat if water remains standing for 2-3 months; these areas provide important amphibian breeding habitat. Rare animals include turtles and dragonflies. Regionally rare ant species are also known to occur in this community type.

Public Access: Due to the sensitivity of calcareous wetlands to damage from visitation, most land owners prefer not to publicize the locations.

Threats: Changes in groundwater quality and quantity, and any human activities that disturb the vegetation, substrate, or water supply. In disturbed areas, cattails may displace calcium-loving species. Beaver activity threatens calcareous fen communities by



altering surface water chemistry. There is evidence to suggest that ponding of water by beaver dams may increase the water's relative acidity, possibly due to the accumulation of organic acids or to dilution from acid rain (Motzkin, 1993). Invasive species tolerant of wet conditions noted in calcareous fens include reed-canary grass (*Phalaris arundinacea*), purple loosestrife (*Lythrum salicaria*), common reed (*Phragmites australis*), buckthorns (*Rhamnus cathartica* and *Frangula alnus*), Japanese barberry (*Berberis thunbergii*), and bush honeysuckle (*Lonicera morrowii*).

Management Needs:

Calcareous Sloping Fens are dependent on groundwater. Since they are small, slight changes in the amount or quality of groundwater could profoundly affect species composition and abundance. Activities occurring uphill, such as groundwater withdrawal, could reduce flows to the fen. Surface discharges may also increase flows as well as erosion. Disturbance such as ditching or other alterations to drainage patterns can also have significant effects. Impounding of wetlands from road crossings or from beaver activity can increase water levels, flooding the fens and eliminating habitat. At the same time, without natural disturbance events, vegetation succession leading to increasing shrub dominance could reduce the size of these peatland communities and their rare species habitat. Periodic grazing, mowing, fire, or short-term flooding may be necessary to maintain open fen habitats.

USNVC/NatureServe:

Dasiphora fruticosa ssp. *floribunda*/*Carex* (*sterilis*, *hystericina*, *flava*) Shrub
Herbaceous Vegetation [CEGL006326] G2.