



Calcareous Basin Fen

Community Code: CP2B0A3000

State Rank: S1



Concept: Sedge-shrub peatlands occurring in well-defined basins that have calcareous groundwater (and sometimes surface water) inputs. Calcareous Basin Fens are the least rich of the three calcareous fen communities described in Massachusetts.

Environmental Setting: Calcareous Basin Fens occur in well-defined basins with permanently saturated deep (>2m (6.5 ft.)) peat and consolidated or floating sedge-dominated peat mats around any open water in the basin. Waters are circumneutral to alkaline (pH 6.0-8.1), with high concentrations of calcium and magnesium cations and bicarbonate anions dissolved from limestone and dolostone bedrock or glacial materials rich in those elements. They are the least rich (with respect to water chemistry) of all the calcareous fen communities, at least partially because the nutrients get tied up in the thick peat and are not available for plant growth. Water moves slowly in peat and oxygen that groundwater carries is quickly used up: the resulting anaerobic conditions inhibit growth of microorganisms that would otherwise break down remains of dead plants, which contributes to the development of more peat. Because peat tends to absorb ions that are plant nutrients and release acid-forming hydrogen ions, the resulting water in thick peat is fairly acidic, despite the presence of calcium. This community type has existed at sites for a few thousand years and appears to be relatively stable over time.

Vegetation Description: Calcareous Basin Fens are sedge-dominated peatlands with scattered shrubs. Typical sedges include slender woolly-fruited sedge (*Carex lasiocarpa* ssp. *americana*) and water-sedge (*C. aquatilis* ssp. *altior*), with multiple other sedges, narrow-leaved cattail (*Typha angustifolia*), and white beaksedge (*Rhynchospora alba*). There are often patches of hard-stemmed bulrush (*Schoenoplectus acutus*



var. *acutus*). Grass of Parnassus (*Parnassia glauca*) may also be present. Scattered shrubs include shrubby cinquefoil (*Dasiphora floribunda*) and sweet-gale (*Myrica gale*), associated with typical bog/acidic fen species such as pitcher plant (*Sarracenia purpurea*), round-leaved sundew (*Drosera rotundifolia*), bog rosemary (*Andromeda polifolia* var. *glaucophylla*), twig rush (*Cladium mariscoides*), buckbean (*Menyanthes trifoliata*), and large cranberry (*Vaccinium macrocarpon*). Mosses are extensive and may include star campylium moss (*Campylium stellatum*), *Calliergonella* spp., and *Sphagnum* spp. In the increasingly wet area near the upland edge, a dense shrubby zone may include dense bog birch (*Betula pumila*).

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 Basin Fens have deep (> 2.0 meters (6.5 ft.)) peat in basins. They are dominated by sedges with a sparse shrub layer; they generally contain a more developed bryophyte layer than the other calcareous fens. They share many species with acidic fens, but include species restricted to calcareous conditions, such as bog birch and the calciphiles listed above. 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. Calcareous Seepage Marshes have a mixture of herbaceous, graminoid and shrub species similar to an emergent marsh, with mucky peat generally 0.5 to 2m deep. They are generally flat to slightly sloping. 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 basin fens can function as vernal pool habitat if water remains standing for 2-3 months; these areas provide important amphibian breeding habitat.

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).

Management Needs: Fires, grazing, and/or mowing may be necessary to maintain open fen habitats. More information is needed.



USNVC/NatureServe:

Myrica gale-*Dasiphora fruticosa* ssp. *floribunda*/*Carex lasiocarpa* - *Cladium mariscoides* Shrub Herbaceous Vegetation [CEGL006068] G2G3; *Cornus racemosa*/*Carex (sterilis, aquatilis, lacustris)* Shrub Herbaceous Vegetation (CEGL006123) G2G3.