

### **Inland Lake Clay/Mud Shore**

*Plant communities on clay, mud, or silt substrates—often mixed with organic detritus—on shores of inland lakes and ponds. Vegetation is typically zonal, reflecting seasonal changes in water level. LKi54 includes plant communities in shallow basins and along the edges of ponds and lakes where spring flooding is followed by summer drawdown, exposing mudflats that are colonized by plants.*

#### **Vegetation Structure & Composition**

Description is based on field observations, supplemented by species lists from aquatic plant surveys of 877 lakes, mostly in central and northern Minnesota.

- **Vegetation** cover ranges from sparse to dense but varies seasonally (along with composition). Distinct upper and lower zones are usually present, with lower zones often expanding as water levels fall over the summer. (See **Native Plant Community Types in Class** below for details on species composition.)
- **Upper zone** lies above normal water levels where seasonal flooding, erosion by storm waves, and ice-scouring prevents formation of stable plant communities, especially on larger bodies of water.
- **Lower zone** is present at or just above normal water levels, extending below normal water levels on exposed substrates during periods of low water. At normal water levels, lower zones are washed by waves almost daily. Lower zones include plant communities on mudflats exposed in ponds or shallow basins and bays during annual summer drawdown. Plant species in lower zones include terrestrial forms of aquatic plants and seedlings of terrestrial plants. Many of the plants are annuals that germinate from seeds buried in sediments or dispersed by wind or water.

#### **Landscape Setting & Soils**

LKi54 occurs in shallow basins and along lake and pond margins. Substrates consist of silt or clay mixed with marl or with sedimentary peat composed of plant and animal residues. When water levels are high and sediments are flooded, planktonic, benthic, and aquatic organisms produce organic detritus and deposit inorganic salts, which influence nutrient content and chemistry of sediments.

#### **Natural History**

Wave action and ice scouring are important in maintaining the open structure of shoreline communities. Wave action is most important during periods of high wind, especially storms. Ice scouring occurs primarily during spring breakup, when winds push large pieces of ice on shore. Lakeshore communities typically vary in extent over the growing season and from year to year under influence of repeated flooding and drawdown and erosion and deposition of sediment and organic debris. These influences often result in zonal patterns of vegetation. Characteristic plants include annual species whose seeds are dispersed by wind or water or that can remain dormant for long periods buried in sediment and germinate when conditions are suitable (often as water levels fall and expose sediments along the shore). Also present in shoreline communities are perennial herbaceous species tolerant of inundation, erosion, and stranding. Many of the perennial species are rhizomatous, and there may be a tendency for species to be dispersed by floating propagules.

#### **Similar Native Plant Community Classes**

##### ● **RVx54 Clay/Mud River Shore**

RVx54 shares a number of species with LKi54; distinguishing the two classes is most difficult along riverine lakes where shorelines are influenced both by seasonal flooding and by wave action.

##### ● **LKi32 Inland Lake Sand/Gravel/Cobble Shore**

LKi32 occurs in similar settings and along shores of many of the same lakes as LKi54, and the two communities may share some species, especially when LKi32 is present on sand.

### **Native Plant Community Types in Class**

LKi54 has been poorly sampled in Minnesota, but is known to occur throughout the state. Delineation of the community is based primarily on characteristics of the physical environment.

#### ● **LKi54a Clay/Mud Shore (Inland Lake)**

LKi54a is present on silt or clay substrates along the shores of ponds, small lakes, and protected shallow bays. Species composition of the lower zone is similar to that of LKi54b2 (see below). The upper zone contains species such as false indigo (*Amorpha fruticosa*) and woolgrass (*Scirpus cyperinus*) that do not persist in the lower zone. LKi54a occurs throughout the state.

#### ● **LKi54b Mud Flat (Inland Lake)**

LKi54b occurs in shallow basins on mud sediments that are flooded in the spring and exposed later in the season as water levels fall. Soils typically consist of silt and clay mixed with marl or with sedimentary peat composed of plant and animal residues precipitated from standing water. LKi54b is divided into two subtypes based on salinity.

##### ○ **LKi54b1 Saline Subtype**

Present on mud substrates with high concentrations of dissolved salts. Plant species diversity is low, with vegetation composed of species adapted to high concentrations of dissolved salts, including red saltwort (*Salicornia rubra*), salt grass (*Distichlis spicata*), Nuttall's alkali grass (*Puccinellia nuttalliana*), seablite (*Suaeda calceoliformis*), plains bluegrass (*Poa arida*), and prairie bulrush (*Scirpus maritimus*). LKi54b1 has only been documented in Minnesota at one site in the extreme western part of the state in the Minnesota River Prairie Subsection of the CGP.

##### ○ **LKi54b2 Non-Saline Subtype**

Present on exposed clay or mud substrates along shorelines or in shallow basins. Vegetation is composed of terrestrial forms of aquatic plants and seedlings of annual plants that develop from seeds buried in the sediments or dispersed from other communities. Most of the vegetation, especially by late summer, is composed of seedlings of umbrella or nut sedges (*Cyperus squarrosus*, *C. odoratus*, and other *Cyperus* species), spikerushes (*Eleocharis intermedia*, *E. obtusa*, *E. acicularis*, and other *Eleocharis* species), rushes (*Juncus nodosus*, *J. tenuis*, *J. pelocarpus*, and other *Juncus* species), bulrushes (*Scirpus validus* and other *Scirpus* species), smartweeds (*Polygonum amphibium* ssp. *emersum*, *P. lapathifolium*, and other *Polygonum* species), plantains (*Plantago major* and *P. rugelii*), goosefoots (*Chenopodium* spp.), beggarticks or bur marigolds (*Bidens cernua*, *B. frondosa*, and other *Bidens* species), arrowheads (*Sagittaria latifolia*, *S. cristata*, and *S. rigida*), giant bur reed (*Sparganium eurycarpum*), and golden dock (*Rumex maritimus*). These species often form dense stands by later summer or autumn. Floating-leaved aquatic species such as water lilies (*Nuphar* spp. and *Nymphaea* spp.) are common, often as rosettes of leaves sprouting from large rhizomes on the mud surface. Other rooted macrophytes, such as pondweeds (*Potamogeton* spp.), water stargrass (*Zosterella dubia*), mud plantain (*Heteranthera limosa*), and water shield (*Brasenia schreberi*), are also common but can be quite different in appearance from their more typical submerged growth forms. LKi54b2 occurs in shallow ponds, lakes, and bays across Minnesota.

photo by K. Myhre MN DNR



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