Inland Lake Rocky Shore

Sparsely vegetated plant communities on wave-washed bedrock, boulder, or large-cobble shores along inland lakes. Present in the zone between normal low-water level and the upper reach of storm waves or ice scouring.

Vegetation Structure & Composition

Description is based on field observations and review of field notes for lakeshore communities.

- **Lichens** are the dominant cover on bedrock and bolder substrates.
- **Vascular plant** cover is sparse on bedrock substrates and variable on boulder substrates. Vegetation often has distinct zones related to fluctuations in water level and degree of exposure to wave action and ice scouring. Zones are most pronounced on large lakes and shores exposed to storm waves and ice scouring. On small lakes and in shoreline areas protected from waves and ice scouring, zonation is less pronounced, with a narrow upper zone typically present and a lower zone sometimes present.
- **Upper zone** lies just above normal water levels, where seasonal flooding, erosion of finer substrates by waves, and ice scouring exert strong influence on the composition of plant communities. Vascular plants in this zone—including perennial grasses, shrubs, and forbs—are rooted between boulders or in bedrock crevices. In the Border Lakes Subsection in the NSU, sweet gale *(Myrica gale)* and lenticular sedge *(Carex lenticularis)* are often present between boulders, and common polypody *(Polypodium virginianum)* is common on bedrock at the upper edge of the zone. Moss and lichen cover is often significant on shores with bedrock or large boulder (> 18in [45cm] in diameter) substrates and where shores are well protected from waves and ice.
- **Lower zone** lies in the area of greatest wave and ice influence at or below the water's edge, becoming exposed when water levels fall below normal. Vascular plant cover is usually absent in the lower zone, although emergent and floating-leaved aquatic plants are occasionally present on boulder substrates.

Landscape Setting & Soils

LKi43 occurs on wave-washed rocky shores in the zone between low-water levels and the upper reach of storm waves or ice scouring. Substrates consist either of bedrock or of boulders larger than 12in (30cm) in diameter. When present, soils are usually shallow, poorly developed, and confined to crevices and depressions in bedrock or spaces between boulders. LKi43 is generally restricted to landscapes where bedrock is present at or near the ground surface or where large boulders are common in glacial till.

Natural History

Wave action and ice scouring maintain the open structure of the community. Wave action is most important during periods of high winds, especially storms. Ice scouring occurs primarily during spring breakup, when winds may push large pieces of ice on shore, sometimes forming ice-thrust ridges on boulder shores. In upper beach zones, impacts from flooding, erosion by waves, and ice scouring are typically of short duration and diminish significantly with distance above the normal shoreline. The extent of the community may change seasonally and from year to year as water levels fluctuate. Plant species present in LKi43 experience extreme fluctuations in temperature and in moisture availability due to paucity of moisture-holding soil. LKi43 is typically the most sparsely vegetated of the inland lakeshore communities.

Similar Native Plant Community Classes

- **LKi32 Inland Lake Sand/Gravel/Cobble Shore**

When present on cobble substrates, LKi32 and LKi43 can be similar. By definition, however, LKi32 occurs on cobbles < 12in (30cm) in diameter, while LKi43 occurs on rocks > 12in in diameter.

- **LKu43 Lake Superior Rocky Shore**

LKu43 occurs on wave-washed bedrock and boulder shores along Lake Superior and

can be similar to LKi43. By convention, all shoreline communities along Lake Superior are classified in the Lake Superior (LKu) Floristic Region. LKu43 supports disjunct populations of arctic and alpine plants that are absent from LKi43.

- **RVx43 Rocky River Shore**

RVx43 may share a number of species with LKi43; distinguishing the two classes is most difficult along riverine lakes where shorelines are influenced both by seasonal flooding and by wave action.

- **CTn11 Northern Dry Cliff**

LKi43 can grade into CTn11 above the reach of storm waves along lakeshores with tall vertical bedrock faces rising from the water.

- **ROn12 Northern Bedrock Outcrop**

LKi43 can grade into ROn12 above the reach of storm waves along lakeshores bordered by large level or sloping bedrock exposures.

Native Plant Community Types in Class

Very little systematically collected vegetation data exist for LKi43 in Minnesota. Delineation of the community is based primarily on characteristics of the physical environment.

- **LKi43a Boulder Shore (Inland Lake)**

LKi43a is present on wave-washed boulders or large cobbles (> 12in [30cm] in diameter). Vascular plant cover is variable, with plants generally limited to patches of silt, sand, or organic matter between boulders or cobbles. In the zone just above normal water levels, vegetation is composed of shrubs and perennial and annual herbaceous species. Characteristic plants in this zone include meadowsweet *(Spiraea alba)*, leatherleaf *(Chamaedaphne calyculata)*, soft rush *(Juncus effusus)*, northern blue flag *(Iris versicolor)*, sweet gale *(Myrica gale)*, lenticular sedge *(Carex lenticularis),* and yellow loosestrife *(Lysimachia terrestris)*. Moss and lichen cover is often significant in the upper zone on shores with large (> 18in [45cm]) boulders and where shores are well protected from waves and ice scouring. In the zone just below normal water levels, LKi43a may have occasional emergent and floating-leaved aquatic plants, including soft rush *(Juncus effusus)*, broad-leaved arrowhead *(Sagittaria latifolia)*, northern blue flag, wild calla *(Calla palustris)*, and water horsetail *(Equisetum fluviatile)*. LKi43a occurs most commonly along lakeshores on the Canadian Shield in the NSU but may also be present on lakes in other parts of Minnesota.

- **LKi43b Bedrock Shore (Inland Lake)**

LKi43b is present on wave-washed bedrock shores in the zone above the water's edge where influence from waves and ice scouring is common. Vegetation is sparse, with vascular plants limited to soil accumulated in cracks, crevices, or small depressions in the bedrock. Characteristic species in upper zones include perennial grasses, forbs, shrubs, and trees such as poverty grass *(Danthonia spicata)*, redtop *(Agrostis* spp.), harebell *(Campanula rotundifolia)*, common polypody, rock cress *(Arabis* spp.), alder *(Alnus* spp.), three-toothed cinquefoil *(Potentilla tridentata)*, white cedar, jack pine, white pine, and paper birch. Lichens and mosses are common on rocks in the upper part of the shore zone, especially on sites protected from waves or ice scouring. LKi43boccurs primarily along lakeshores on the Canadian Shield in the NSU.

photo by D.S. Wovcha MN DNR

Basswood Lake, Lake County, MN