EASTERN LAKE ONTARIO SAND DUNES: AN OVERVIEW OF THEIR FLORA

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INTRODUCTION

Sand dunes are a very challenging habitat for plant life. The dunes hold plant nutrients very poorly and are constantly subjected to wind and water erosion. Few plants can tolerate the low fertility, unstable conditions, and extreme fluctuations in temperature and moisture found in dunes. Without these plants, though, lakeshore dunes would resemble desert dunes, constantly changing and moving across the landscape. The dune ridges that line the eastern shore of Lake Ontario are stabilized by plants that are specially adapted to the harsh conditions.

In total, 315 vascular plant species have been reported living on our dune system. These can be grouped into four recognizable plant communities: the American beachgrass community; the poison ivy-dune grape-cottonwood community; the red oak-red maple forest community; and the alder thicket community. The following description of the dune flora of eastern Lake Ontario includes a general discussion of each community and the dominant plants that make up at least half of the cover found in each. A checklist is also provided. It includes the 46 most common dune species, plus 23 additional species that are readily visible from public access points.

THE BEACHGRASS COMMUNITY

Immediately adjacent to the beach lie long, sparse stands of beachgrass and tall wormwood, punctuated by stands of cottonwood saplings and shrubby dune willows. This is the beachgrass community that occurs on our foredunes, the first line of dunes above the beach. This community can also be found on blowout areas on the interior dunes, and at the back of the barrier in disturbed areas.

Beachgrass (or marram grass) is a tough, coarse grass that may grow to knee height; it spreads by underground runners known as rhizomes. The rhizomes travel in a line parallel to the surface, a few inches down, sending up new shoots called tillers every foot or so. Beachgrass tillers form a barrier that slows down wind, especially in the first few inches above the surface where most sand movement occurs. In this way beachgrass acts as a wind break, much as a snow fence does in the winter.

Not only can beachgrass endure the onslaught of the wind, it also thrives under burial by sand. It responds by growing vigorously up through the sand and by starting new rhizomes as the old ones become buried. The successive layers of rhizomes, with fine roots growing from them, form a tight network that holds sand in place, allowing dunes to grow and stabilize.

Tall wormwood is a biennial plant that grows scattered among the beachgrass tillers. It germinates from seed in early summer, producing small, lacy gray-green tufts of vegetative growth as summer progresses. While many individuals succumb to desiccation or burial before fall, some survive to produce tall, bushy stems that bloom late the following summer. Several similar species of wormwood occur on most United States seacoast dunes and throughout the Great Lakes. Tall wormwood is closely related to the ornamental dusty miller, and to the sagebrush of the western plains.

Eastern cottonwood, a tree that commonly grows along riverbanks throughout the eastern and midwestern United States, has windblown seeds that are released in June, blanketing the lakeshore area. The seeds germinate in damp, open sites in the drift line at the upper limit of summer waves, with seedlings appearing in late June to early July. Although most of them are washed away, in some years high water levels do not reach

the seedlings, and a new line of cottonwood trees is established to grow up and join beachgrass in trapping sand to build dunes. As sand continues to accumulate, cottonwoods can sprout new roots along the buried portion of their trunks, thus enabling cottonwood to be the only dune-forming tree on the eastern shore of Lake Ontario.

Sand-dune (heart-leaf) willow and sand cherry are two rare shrubs that belong to the beachgrass community. Sand-dune willow has broad, leathery, heart-shaped leaves densely covered with white hairs. It spreads by rhizomes, forming loose, multi-stemmed colonies that rarely grow more than 8 to 10 feet tall. Sand-dune willow is restricted to the Great Lakes dunes, and is listed as threatened in New York State. However, it is common on our Lake Ontario eastern shore, where it grows along the tops of the foredunes, into low interior areas called swales, and even onto stabilized secondary dunes.

Sand cherry is a low shrub, rarely growing more than three to four feet high, that remains vigorous only where sand continues to accumulate. It is most conspicuous in early June when covered with delicate white blossoms. Sand cherry is easily visible from the beach when in bloom, but is very rare on the eastern shore dunes. Sand cherry is listed as rare in New York State.

A few hardy beach annuals are scattered near the beachward toe of the foredunes, especially in the rows of wind-driven debris. They are entirely at the mercy of waves, wind, and human activity, but somehow they manage to germinate, grow, and reproduce each summer before fall and winter storms wash them away. Beach clotbur has rough, sandpapery, triangular leaves and sharp burry fruits. It is the most common beach plant on the eastern shore. Sea rocket grows only on sandy beaches and is quite uncommon on the eastern shore. It has thick fleshy leaves and tiny white flowers with four petals.

In some years after a strong wind, the beach will contain narrow lines of seedlings of many plants not particularly adapted to beach living. These plants are fun to explore even though they are generally gone within a few weeks.

THE POISON IVY - DUNE GRAPE - COTTONWOOD COMMUNITY

The beachgrass community changes growing conditions on the sand it occupies and on the interior dunes behind it. Plants shade the surface, moderating temperature fluctuations and moisture availability. Leaves that drop each year decompose and release plant nutrients. Moving sand falls as wind velocity drops, so both wind speed and sand movement decrease behind the first dune. Terrain is rolling on the interior dunes, with damp swales and dry secondary dunes, and some blowout areas where sand is still moving. The poison ivy-dune grape-cottonwood community takes advantage of these improved but variable conditions, featuring several new plants in addition to declining proportions of beachgrass community members.

Dominants of this community are common, widely distributed plants that live together in an uncommon arrangement on the dunes. Cottonwoods, still the only trees in evidence, are clumped on the tops of the secondary dunes. In most habitats poison ivy and dune (or riverbank) grape have strong climbing tendencies, but not on the dunes. Here they grow together in large, tangled, bushy patches two to five feet high.

Chokecherry, a shrub with clusters of bitter, deep purple berries, is abundant in this community. Another common plant is the European buckthorn, a shrub with deep green, glossy leaves and poisonous black berries. On the ground, beachgrass has given way to gray and Canada goldenrod, spotted knapweed, and a variety of grasses and grasslike plants. Baltic rush is one grasslike plant that is characteristic of Great Lakes dunes. This plant can be recognized by its 12-to 18-inch tall, dark green, slender stems, growing in a line from an underground rhizome. These plants form dense stands in damp swales.

THE RED OAK - RED MAPLE DUNE FOREST COMMUNITY

High dunes are scattered along Lake Ontario's eastern shore. The high dunes support a red oak-red maple dune

forest. The red oaks and red maples are joined by American beech, sugar maple, and black cherry to form an open-canopied overstory. Thriving understory trees include striped maple, shadbush and chokecherry. Dune grape and poison ivy are still present, but in lower proportions. The beachgrass community species are entirely gone, needing full sun to survive. On the ground, dense patches of red raspberry alternate with poison ivy-dune grape thickets. Dominant species on the ground include late- and blue-stem goldenrods and wild sarsaparilla. All of the aforementioned plants are common upland species of the surrounding area.

THE ALDER THICKET COMMUNITY

The transition zone between dunes and wetlands is an almost impenetrable tangle of shrub thickets. This community can be viewed from ponds and streams that course through the wetlands behind the barrier. Speckled alder, which dominates the closed canopy, forms multi-stemmed clumps about 20 feet tall. Sometimes winterberry or nannyberry dominate, particularly near the bottom of forested high dunes. A few large, multi-stemmed hybrid willows rise above the thicket, as do some young green ash trees. Dune grape is abundant and climbs in this dense community. Black cherry saplings, smaller shrubs of arrowwood, and chokecherry are scattered among the dominants. On the ground, patches of red raspberry are found on drier mounds alternating with sensitive ferns, wetland grasses, and sedges in the wet depressions.

Vegetation of the interior and back dunes is dependent on the stabilized conditions provided by an intact foredune. Beachgrass is adapted to the natural challenge of nature, but not to the added stress of human intrusion. When beachgrass cover is disturbed, sand blows into the barrier, burying and killing the plants.

For a field list of Vascular Plants please visit the Eastern Lake Ontario Dunes and Wetlands Area website.

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