



**Status:** State special concern

**Global and state rank:** G5/S3

**Family:** Poaceae (grass)

**Other common names:** dune grass, American dune grass, sea lyme-grass, strand-wheat

**Synonyms:** *Leymus mollis* (Trin.) Pilger. var. *mollis*, *Elymus arenarius* L. var. *villosus* H.E. Meyer

**Taxonomy:** The tetraploid *E. mollis* is closely related to the European *E. arenarius*. Gleason and Cronquist (1991) have placed both of these species in the genus *Leymus*, separating them by their lack of awns, larger anthers, creeping rhizomes, and outcrossing mode. Bowden (1957) notes, however, that *E. mollis* is highly to partly self-fertile.

**Total range:** A predominantly boreal species, *Elymus mollis* is widespread on the arctic shores from Alaska and northern Canada to Greenland, from Iceland to eastern Asia, Korea, and Japan, and ranges southward in North America from the California coast, to Hudson Bay, Lake Superior and Massachusetts. It is rare in Massachusetts and Michigan and is considered extinct in New Hampshire where it was last observed in 1895.

**State distribution:** *Elymus mollis* is known only from the southern shore of Lake Superior in Michigan, with a total of 21 reported occurrences. Eighteen of these were documented from 1962 to 1984, with the remainder dating from 1957 or earlier. The majority of these occurrences are described as small, local populations, with only two cited

as frequent or locally common. Two occurrences are along Pictured Rocks National Lakeshore, one is from Muskallonge State Park, and three are from Grand Island, now a designated U.S. Forest Service National Recreation Area.

**Recognition:** American dune wild-rye is a large, erect, and somewhat glaucous grass arising from long, stout, rhizomes (underground stems), with crowded overlapping sheaths at the base, terminating in a dense spike of numerous 4-6 flowered spikelets. The stems are finely and densely hairy at the summit, just below the spike and bear leaves up to 15 mm wide. The glumes (tiny scales at the base of spikelets) are strongly nerved and hairy, and the lemmas (first bract at base of individual floret) lack awns (elongated bristle at tip).

The introduced European species *E. arenarius* (*L. arenarius*) looks similar but is more strongly glaucous, and both the summit of the stems just below the inflorescence and the glumes are essentially glabrous. Other *Elymus* species in Michigan differ by the presence of awns. The more common beach grass (*Ammophila breviligulata*), a frequent associate, is not glaucous, and upon close inspection reveals a branched inflorescence, which for dune wild-rye is simple.

**Best survey time/phenology:** Data regarding the phenology of dune wild-rye is limited, however, at least one specimen was noted in flower on June 21 and another in fruit on August 24. The best survey time is likely to be from late June through August.



**Habitat:** This species is found predominantly along sandy beaches and dunes of shores throughout its range. In Michigan and in Massachusetts, it has been often noted to occur at or above the storm line, and in Michigan it is typically associated with dune grass (*A. breviligulata*) on foredunes and beaches. It is likely associated with other common dune plants in Michigan such as Canada wild rye (*Elymus canadensis*) and wormwood (*Artemisia campestris*). Other associates noted in Massachusetts include beach pea (*Lathyrus japonica*), staghorn sumac (*Rhus typhina*), *Rosa rugosa* (Japanese rose), mustard (*Brassica* sp.), and ragweed (*Ambrosia* sp.).

**Biology/ecology:** The few data and observations available for this species suggest that *E. mollis* possibly persists best at or above beach storm lines (Bowden 1957). The well-developed rhizomes are adaptive to the dune environment as in *Ammophila* and other dune grasses, enabling it to withstand extreme drought. Boivin within Bowden (1957) postulated that *E. mollis* may have migrated by dispersal of seeds and rhizomes along various post-glacial Pleistocene lakes and that isolated populations such as those on Lake Superior persist as relicts. Bowden further postulates that the at least partly self-fertile characteristic of *E. mollis* enhances the ability of isolated populations to perpetuate themselves.

**Conservation/management:** Although little information exists regarding the population trends or current threats to dune wild-rye, its occurrence along shorelines renders it highly vulnerable to impacts from shoreline development and excessive recreational use. This is of particular concern due to its apparently local and patchy distribution. For this reason, it is also vulnerable to local environmental disturbances, such as severe storm events. Conservation and management strategies should incorporate sufficient shoreline habitat to provide refugia during high lake levels and to provide potential seed sources should local extirpation occur. In addition, strategies to eliminate or minimize impacts from ORVs or other recreational activities that result in trampling or disturbance must be considered.

**Research needs:** A statewide assessment to determine the status and distribution of *E. mollis*, as well as a determination of population trends and current threats are the primary research needs for this species. Studies of virtually any aspect of its biology and ecology are also needed in order to develop optimal management and conservation strategies.

**Related abstracts:** Open dunes, fascicled broom-rape, Lake Huron tansy, Pitcher's thistle, Pumpelly's brome grass, Lake Huron locust, piping plover.

#### Selected references:

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