

Solidago houghtonii A. Gray

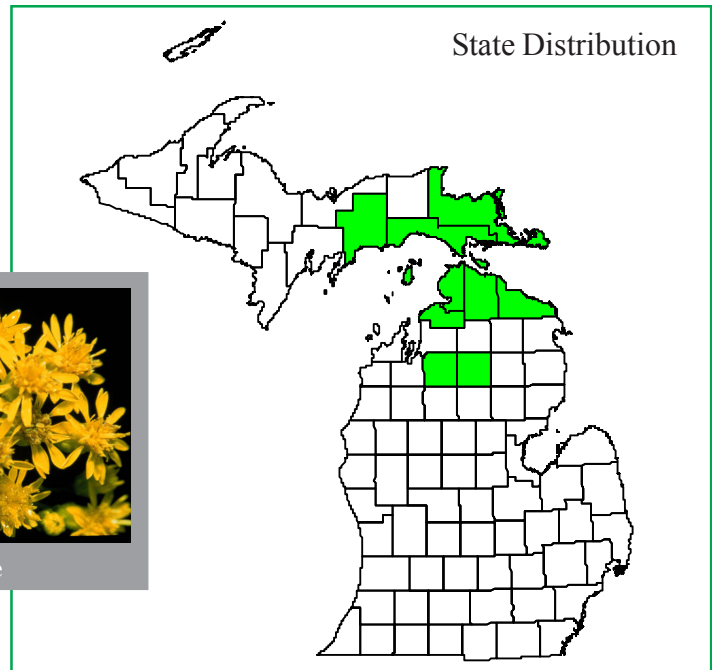
Houghton's goldenrod



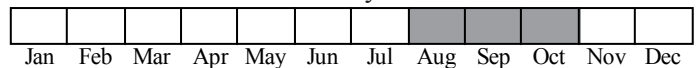
Photo by Phyllis J. Higman



Photo by Doug Moore



Best Survey Period



Status: State threatened, federal threatened

Global and state rank: G3/S2S3

Family: Asteraceae (Aster family)

Taxonomy: Although *Solidago houghtonii* is widely accepted as a distinctive species, its origin and affinities are disputed. Morton (1979) theorizes that a hybrid of *S. ptarmicoides* (Nees) Boivin (long known as *Aster ptarmicoides* (Nees) T. & G.) and *S. ohioensis* Riddell backcrossed with *S. ohioensis* to form a sterile triploid (three sets of chromosomes); a subsequent doubling of chromosomes resulted in the fertile hexaploid ($6x = 54$) known as *S. houghtonii*. Semple & Ringius (1983), among others, disagree, concluding that *S. riddellii* Frank, not *S. ptarmicoides*, is the second parent. Most anomalous in the *S. houghtonii* "complex" is a population identified in Crawford County within Camp Grayling. These plants are reportedly octoploids, apparently the only such ploidy level known for a *Solidago* species, and differ somewhat from shoreline populations, thus possibly representing a different taxon. A reported disjunct station in Genesee County, New York (Bergen Swamp), is now believed to represent hybrids between *S. ptarmicoides* and *S. uliginosa*.

Total range: Houghton's goldenrod occurs primarily along the northernmost shores of Lakes Michigan and Huron, ranging east to the Bruce Peninsula in Ontario.

Isolated inland stations of what some authors believe to be this species occur in Crawford and Kalkaska counties, Michigan, more than 100 km south of the Mackinac Straits region. A second disjunct station of what is currently considered to be this species occurs in western New York.

State distribution: The greatest concentrations of *S. houghtonii* lie in Chippewa, western Mackinac, northern Emmet, Cheboygan, and northern Presque Isle counties. Each of these areas has large populations extending over at least a mile of shoreline, as well as several scattered smaller populations. About 60 occurrences are known overall.

Recognition: Houghton's goldenrod has smooth, slender, often somewhat reddish stems that reach 3-6 dm in height. The well-scattered, pointed leaves are long (to 1.3 dm), narrow (less than 1 cm), and often folded along the midrib (conduplicate), tapering to a slightly clasping base. Terminating the stem is a more or less flat-topped, branched inflorescence consisting of relatively few, showy, large flower-heads that may number from 5-30 and not uncommonly more (standard manuals, basing their description on the wrong nomenclatural type, incorrectly state the number of flower-heads to be only 5-15). The branches and pedicels (flower stalks) of the inflorescence are finely hairy, at least sparsely so, with fine upcurving hairs, and the achenes are smooth and ribbed.

This species is most likely to be confused with the



widespread *Euthamia graminifolia* (grass-leaved goldenrod) and *S. ohioensis* (Ohio goldenrod). *Euthamia graminifolia* can be distinguished by its more leafy stem lacking basal leaves when in flower. It also has narrower 3-5 nerved leaves, and an inflorescence composed of distinctly smaller flower heads with short ray flowers and hairy achenes. *Solidago ohioensis*, the goldenrod most similar to *S. houghtonii* in northern Michigan, is a more robust species with leafier stems. It usually has broader, more flattened, ovate-lanceolate leaves and a dense, many-headed inflorescence. Other features include **smooth branches and pedicels, smaller ray flowers**, and smooth, unribbed achenes.

Best survey time/phenology: *Solidago houghtonii* is best identified during peak flowering, when it is most easily distinguished from the extremely similar *Solidago ohioensis*. Flowering occurs from about early August through early September, with plants often blooming into October.

Habitat: *Solidago houghtonii* occurs primarily along the northern shores of Lakes Huron and Michigan, restricted to calcareous beach sands, rocky and cobbly shores, beach flats, and most commonly the shallow, trough-like interdunal wetlands that parallel shoreline areas. This species also occurs on seasonally wet limestone pavement, its more typical habitat in the eastern portion of its range, primarily in Ontario (Morton 1979; Semple and Ringius 1983). Common plant associates include *Parnassia glauca* (grass-of-Parnassus), *Lobelia kalmii* (Kalm's lobelia), *Calamintha arkansana* (Arkansas mint), *Tofieldia glutinosa* (false asphodel), *Potentilla fruticosa* (shrubby cinquefoil), *Gentiana procera* (fringed gentian), *Carex crawei* (sedge), *C. garberi* (sedge), *Eleocharis pauciflora* (spikerush), *Euthamia graminifolia* (grass-leaved goldenrod), *Solidago ohioensis* (Ohio goldenrod), and *Myrica gale* (sweet gale). In the Crawford and Kalkaska county localities, Houghton's goldenrod occurs in an unusual northern wet prairie habitat within the jack pine barrens. There it occupies seasonally inundated areas and old interdunal depressions in a sandy glacial outwash landscape, where it occurs with such species as *Pinus banksiana* (jack pine), *Andropogon gerardii* (big bluestem), *Lobelia spicata* (lobelia), *Castilleja coccinea* (Indian paintbrush), *Eleocharis elliptica* (spikerush), *Potentilla fruticosa*, *Carex conoidea* and *C. flava* (sedges), and several other rare plant species, including *Juncus vaseyi* (Vasey's rush), *Scirpus clintonii* (Clinton's bulrush), and *Viola novae-angliae* (New England violet).

Biology: Houghton's goldenrod is a perennial, frequently forming small clumps (clones) produced vegetatively by means of relatively short rhizomes (underground stem). Flowering occurs primarily in August and early September, but some plants may flower well until October.

Conservation/management: The shoreline habitat of *S. houghtonii* is strongly threatened by residential development and heavy recreational use. Recreational vehicles pose an ever present and increasing threat, as do heavy foot traffic and wetland alterations during the course of shoreline development. Four populations thought to be the largest in existence are currently under protective ownership, one on a Nature Conservancy preserve and three on state land. About fifteen other substantial populations lie on State Forest, National Forest, and State Park lands, receiving some form of protection. Several populations occur partly within Michigan Department of Transportation rights-of-way, in designated and signed protected areas.

Comments: This species is named in honor of Douglass Houghton, Michigan's first State Geologist, whose survey team discovered this Great Lakes endemic on the north shore of Lake Michigan during an 1839 expedition.

Research needs: Investigation of nearly all aspects of the biology and ecology of *Solidago houghtonii* is desirable to determine the smallest colony necessary to maintain a viable population. This includes research on demography, reproductive biology, genetic variability, and basic life-history strategies. Biosystematic and genetic research is also needed to determine the true origin of this taxon and its closest affinities. An understanding of colonization requirements and population dynamics is vital to the conservation of this rare Great Lakes endemic.

Related abstracts: Limestone pavement, open dunes, pine barrens, English sundew, Lake Huron tansy, Pitcher's thistle, Pumpelly's brome grass, zig-zag bladderwort, Caspian tern, dune cutworm, eastern massasauga, Hine's emerald dragonfly, Lake Huron locust, piping plover.

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