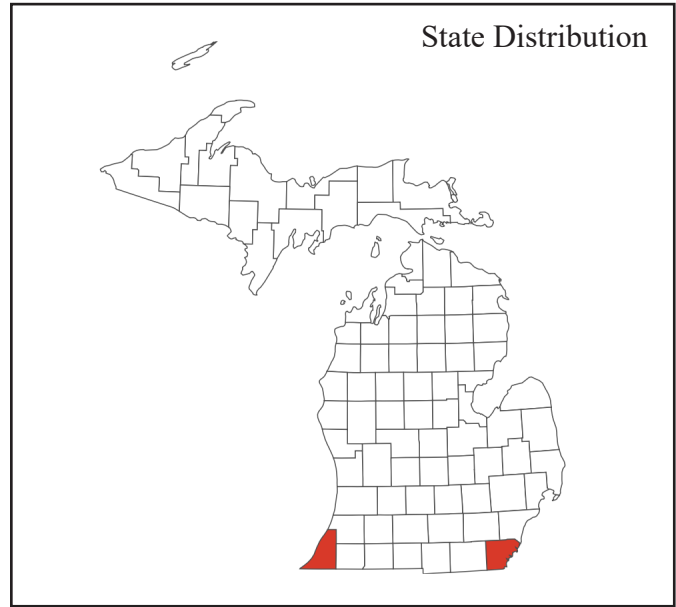




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Best Survey Period



State Status: Threatened

Global and State Rank: G5 (Globally Secure) / SH (Possibly Extirpated) in Michigan

Family: Polygyridae (Polygyrid snails)

Synonyms: *Helix elevata* Say, *Helix (Helicodonta) knoxvillina* A. Férussac, *Helix tennesseensis* I. Lea, *Mesodon (Aphalogona) elevatus* Say, *Mesodon hecicinum* A. Férussac, *Polygra elevate* Say, *Polygyra elevatus* var. *cincta* Pilsbry

Other Common Names: none

Total Range: The distribution of this land snail is limited to the United States, ranging from Michigan into New York, south along the coast through Virginia and North Carolina into Mississippi and Alabama and west to Oklahoma. While the proud globe is listed as globally secure (last review in 2002), most states within its range have no status rank (New York, Ohio, Indiana, Illinois, Missouri, North Carolina, Alabama, Mississippi, Arkansas, and Oklahoma). Proud globe is listed as secure (S5) in Tennessee, vulnerable (S3) in Kentucky, imper-

iled (S2) in Virginia, and possibly extirpated (SH) in Michigan (NatureServe 2026). The global and state status is not well known due to a shortage of survey effort.

State Distribution: Proud globe have been found in the southern portion of Michigan’s Lower Peninsula. Occurrences are limited to Berrien (along the St. Joseph River and in the Lake Michigan drift) and Monroe (in the Lake Erie watershed) Counties. No occurrences of the proud globe have been reported since 1941 (MNFI 2026a), meaning the snail may be extirpated from the state (NatureServe 2026). Daniels (1903) reported the species from all over the adjacent state of Indiana which appears to remain true today (iNaturalist 2026).

Recognition: These yellowish snails are small, reaching 26 mm (1 in) in height with six to seven whorls. Their spiral is low and flattened (helicoid), but the snail is almost as tall as it is wide. The main opening of the shell (aperture) has an elongated, flattened projection (lamina) along the parietal wall (Baker 1939, Mott 1976). These shells are differentiated from others in the genus *Mesodon* by the number of whorls (*M. mitchellianus* has 5 whorls;



M. clausus has 4-5 whorls) and the aperture shape (*M. mitchellianus* and *M. clausus* have round apertures; MNFI 2026b).

Live snails are light brown on their upper surface and lighter on the sides (Mott 1976).



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Best Survey Time: This species is active from the first week of April to the last week of September. Survey methods include visually searching for moving individuals in moist leaf litter and on or under woody debris and litter sampling, when soil and leaf litter samples are collected in the field, dried, and sifted for shells in the laboratory. Surveys are likely to be the most successful following rain

showers or when humidity is high and temperatures are cooler. While land snails are primarily nocturnal, they can be active during the day following a rain event (Burch and Pearce 1991).

Habitat: Proud globe are typically found around calcareous river bluffs (Hubricht 1985) or in ravines dominated by oak, maple, hickory, or sycamore. They have been found in upland areas under leaf litter and around entrances to limestone caves (Dourson 2013).

Biology: Little is known about the specific life history of proud globe and other species in the genus. Land snails are generally important to the larger ecosystem via their roles as decomposers, food sources, dispersers of plants and fungi, and their contributions to biodiversity (Steensma et al. 2009). Overall, land snails are considered generalist detritivores, herbivores, and fungivores, although some are predatory. Snails are often prey for birds, small mammals, amphibians, reptiles, other snails or slugs, and insects (Burch and Pearce 1991).

Snails require calcium to maintain their characteristic shells. Thus, snails are typically found in calcareous regions, with limestone or chalky bedrock or soils derived from limestone with large amounts of calcium carbonate. In addition to soil, snails can obtain calcium from local vegetation (Burch and Pearce 1991) and from absorbing or drinking water high in dissolved calcium (Heller and Magartiz 1983, Martin 2000). Snail shells are an important source of calcium, especially for birds during egg laying (Coppolino 2010).

Land snails are typically more active during periods with cool temperatures and high humidity, when they move slowly over short distances. During active short distance dispersal, snails produce mucous trails, which are primarily composed of water. Thus, sufficient moisture is required (Burch and Pearce 1991). Snail movement is typically restricted to seeking food, primarily via olfaction, or for reproducing. Moisture is also necessary for snail eggs, which are particularly susceptible to desicca-



tion (Burch and Pearce 1991, Martin 2000). Most land snail species can seal their shell openings with an epiphragm, a mucus film that minimizes water loss, to prevent desiccation during dry periods (Burch and Pearce 1991). Longer distance dispersal, although rare, is suspected to be passive, via hitchhiking on mammals, birds, or insects, by wind, or by rafting on objects (Baker 1958, Vagvolgyi 1975).

Most snails are thought to be hermaphroditic (Martin 2000), although land snails show many different reproductive strategies (Leonard 1991). When hermaphroditic, snails have both male and female sex organs and can self-fertilize. Even so, many snails exhibit reciprocal mating, where both partners exchange sperm during copulation (Martin 2000). Internal and external sperm exchange has been documented for snails in this family (Polygyridae; Emberton 1994). Land snails can lay eggs (oviparous), have eggs develop in the mother and juveniles are born live (ovoviviparous), or retain eggs in the mother until they are more advanced and then laid (egg retention; Tompa 1979). While older snails generally produce more clutches of eggs, the total number of eggs and their hatching success were found to be independent of snail size for another species of the genus *Mesodon* (Foster and Stiven 1994).

Conservation/Management: As land snail population declines and species disappearances continue to be documented, the need for dedicated conservation efforts is increasing in priority (Steensma et al. 2009). Land snails like the proud globe are sensitive to habitat changes and unable to quickly disperse from unfavorable conditions (Hylander et al. 2004). Therefore, any activities that alter microclimates and moisture availability should be avoided. This includes activities that remove forest canopy, such as timber harvesting, residential development, and road construction. Land snails tend to avoid dry areas or areas without any vegetation, even seemingly small, unpaved paths. Thus, low traffic hiking trails and ORV use can impact movement and conservation of land snails (Jordan and

Black 2012).

Due to their limited movement and habitat sensitivity, snails use refuges from extreme hot or cold temperatures, dry areas, or predators (Burch and Pearce 1991, Hylander et al. 2004). Common refuges include soil humus, leaf litter, woody debris (such as rotting logs), crevices in bark, rocks, and soils, and under rocks, logs, or boards (Burch 1962). Land snail abundances may be most limited by refuge availability, as opposed to food resources or predation (Burch and Pearce 1991).

Research Needs: Land snails can be critical indicator species for a variety of ecosystems, and a lack of knowledge of these taxa may lead to improper habitat management (Steensma et al. 2009). A review of the global and state status is needed, as a shortage of survey efforts and difficult detection are likely. As such, dedicated surveys using multiple methods (visual, leaf litter collection) to understand proud globe distribution and habitat use would help better identify areas of conservation need. In addition, genetic studies on distinct populations of land snails could help better understand the diversity of these organisms (Perez et al. 2014). Overall, land snails are understudied, and more specific information is needed to better describe their life history for more effective conservation and management.

Related Abstracts: floodplain forest, *Mesodon clausus*, *Mesodon michellianus*

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