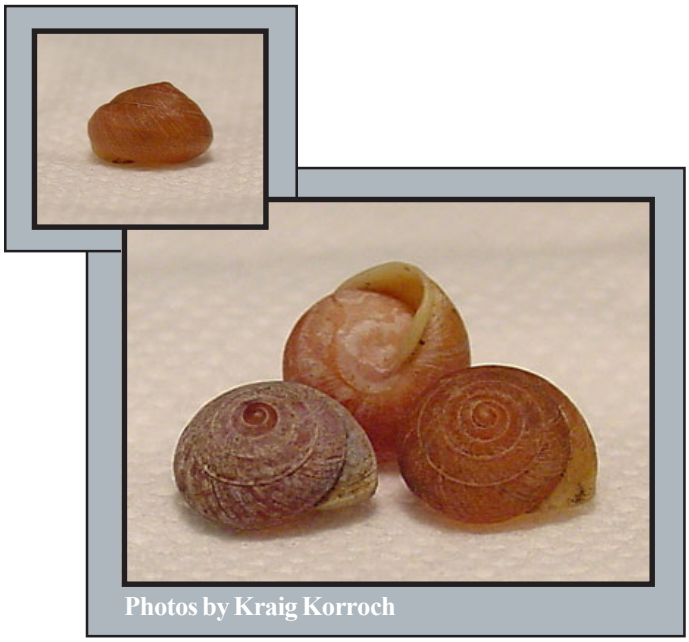
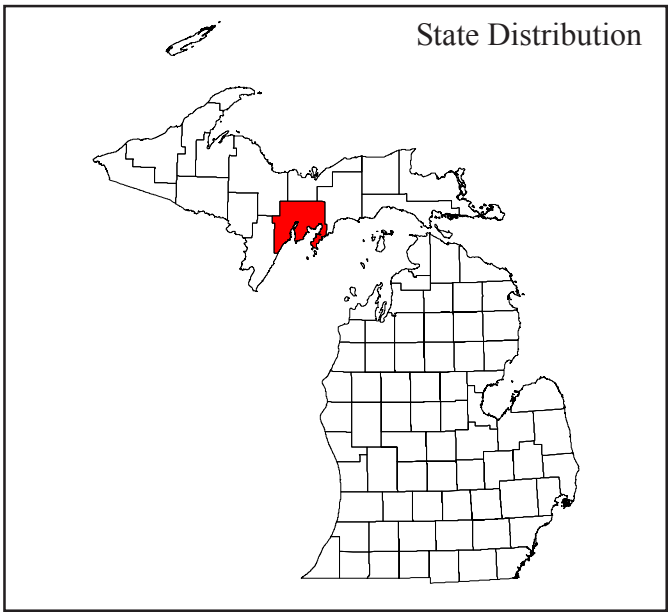
Hendersonia occulta Say — cherrystone drop



Photos by Kraig Korroch



Best Survey Period

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
			■	■	■	■	■	■			

Status: State threatened

Global and state rank: G4/S1

Family: Helicinidae (archaeogastropod or archaeic snail family)

Total range: The cherrystone drop has a wide-ranging but disjunct distribution, occurring from western Virginia and southwestern Pennsylvania west to eastern Oklahoma and north to Wisconsin and Michigan (van der Schalie 1939, Pilsbry 1948, Burch and Van Devender 1980). This snail is known from three disjunct centers of distribution: the Ridge-and-Valley Province in the southern Appalachians, the Paleozoic Plateau and the Niagaran Escarpment in eastern Wisconsin and northern Michigan (Hubricht 1985). The Ridge-and-Valley Province includes areas in southwestern Pennsylvania, western Maryland, Virginia and North Carolina and eastern West Virginia, Kentucky and Tennessee. The Paleozoic Plateau includes northeastern Iowa, southeastern Minnesota, southwestern Wisconsin and northwestern Illinois. This species is rare across its range.

State distribution: In Michigan, this species is extremely rare. The cherrystone drop snail is known from only two occurrences in the Upper Peninsula in Delta County along the Bark River. This snail was first discovered in Michigan at one locality along the main branch of the Bark River in 1939 (van der Schalie 1939). Surveys conducted in 1997 expanded the extent of this known occurrence and documented an additional occurrence along the North Branch of the Bark River (Michigan Natural Features Inventory (MNFI) 2001). Systematic surveys for the cherrystone drop have not been conducted in the state, although surveys for terrestrial snails in the Upper Peninsula in 1998 did not document any new sites for this species (Nekola 1998).

Recognition: The cherrystone drop is an extremely small land snail that looks like a stone or pit of a cherry, based on its color, shape and size (Wilson 1982). Approximately **0.25 inch (5-8 mm) in diameter and in height** (i.e., from base to peak of shell) (Baker 1939,

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Evers 1992, Burch 1994, Nekola et al. 1996), three cherrystone drops could fit easily across the face of a penny (Evers 1992). The snail has a **helicoid shell** (i.e., a low, three-dimensional spiral with a flattened spire and whorls that regularly increase in diameter), with **4.5 to 6.5 whorls that coil to the right** and **a dome-shaped spire** (Baker 1939, Burch 1994). **The shell varies in color from cinnamon red, reddish-brown, purple and rosy pink to tan, orange and pale yellow** (Hubricht 1985, Burch 1994). The shell is very thick, and fine, curved ribs mark the surface (Baker 1939). The snail also has an **operculum**, or lid to seal itself within its shell, and **no umbilicus** (i.e., an opening or cavity in the center of base of the shell) (Baker 1939, Wilson 1982, Evers 1992). The opening or mouth of the shell is crescent-shaped, and the outer shell around the opening is greatly thickened, forming a large, projecting ridge (Baker 1939).

Best survey time: The cherrystone drop can be found anytime from April through September. Based on other land snails, the best survey time for this species is likely in the spring after snowmelt when conditions have warmed up and ground vegetation is minimal (Burch pers. comm.). Surveys conducted after rainfall events during the spring and other times during the active season can be particularly fruitful. During MNFI's surveys for the cherrystone drop in August 1997, hundreds of individuals were observed on tree trunks and other vegetative debris on the day after prolonged, heavy rain, but only a few snails were observed two days after the rain when site conditions were drier (MNFI 2001).

Habitat: The cherrystone drop requires cool, well-shaded, leafy and humid or wet conditions near permanent water as in a stream, river or lake (van der Schalie 1939, Wilson 1982, Evers 1992). This snail also appears to be associated with steep slopes, areas rich in calcium, and moist alluvial soil, often with a layer of humus (van der Schalie 1939, Wilson 1982, Hubricht 1985, Nekola et al. 1996). The only known Michigan populations are found in areas of limestone bedrock on wooded and partially cleared slopes near a stream and in floodplain habitat dominated by northern white cedar (*Thuja occidentalis*). The vegetation on the wooded slopes is a mix of American elm (*Ulmus americana*), American beech (*Fagus grandifolia*) and aspens (*Populus* sp.), and numerous patches of ostrich fern (*Matteuccia struthiopteris*), a plant common on alluvial soils. In other parts of its range, the cherrystone drop is found on or at the base of cool, limestone talus (loose rock) slopes, cliffs, and algific (cold-producing) slopes, river bluffs, mountainsides and waterfalls, and in ravines, floodplains and lake forest habitat (Hubricht 1985, Nekola et al. 1996). Lake forest habitat is comprised of deciduous forest, typically dominated by sugar maple *(Acer saccharum*) and beech, established over shallow bedrock near the Lake Michigan shoreline, and often contains low bedrock cliffs or outcrops (<13 ft/4 m tall) (Nekola et al. 1996). Terrestrial snail surveys in Wisconsin in 1996 documented this species at 9 of 10 Niagaran Escarpment cliff sites (Nekola et al. 1996). The snail also can occupy dry forested habitats under forest debris (Baker 1939).

Biology: Little is known about the biology and ecology of this species. The cherrystone drop is a glacial relict from the Pleistocene, a living fossil and a member of the most primitive mollusk family in North America (Burch and Van Devender 1980, Wilson 1982, Nekola et al. 1996). The cherrystone drop is unique in that it is the only species in its genus, and the only non-tropical member of its family (Wilson 1982). This species also is unique from others in its family in its apparent ecological association with streams and lakes, which may be due to aspects of its life history currently still unknown (van der Schalie 1939).

Cherrystone drop snails are often patchily distributed, and have extremely local distributions within a site (van der Schalie 1939, MNFI 2001). These land snails are found on the undersides of pieces of hardwood twigs and logs, under and among leaf litter, at the base of stumps, and in humus-filled crevices between bedrock blocks (Burch 1994, Nekola et al. 1996). In dry weather, these snails remain under leaf litter and other debris. In wet weather, particularly after heavy rains, cherrystone drop snails can be found crawling on leaves, logs and rocks, and climbing on tree trunks (Hubricht 1985, MNFI 2001). Based on the life history of other land snails, cherrystone drop snails likely hide in small crevices and become inactive during late fall and winter (Burch pers. comm.).

The cherrystone drop feeds on vegetative material by scraping surfaces with its tongue that is covered with rows of hard teeth (Evers 1992). This snail reproduces by laying eggs (Evers 1992). It deposits eggs in moist

locations under leaf litter or logs. Other land snails are bisexual and can self-fertilize, but cherrystone drop snails are unisexual (i.e., either male or female) (Evers 1992).

Conservation/management: Cherrystone drop snails exist in small and isolated populations, and appear to be restricted to specific and narrow habitat conditions (Evers 1992). Any changes to their immediate environment could threaten their persistence at a site (Evers 1992). Additionally, given its small size and low mobility, the cherrystone drop would not easily recolonize if extirpated from a site (Morse 1997).

The cherrystone drop is highly vulnerable to habitat loss and disturbance, such as timber harvesting, particularly removal of the tree canopy or overstory, and disruption of geological and hydrological conditions and dynamics (Evers 1992, Morse 1997). These land snails also are vulnerable to trampling by visitors at sites that are accessible by the general public and have high recreational value (Morse 1997). This is currently not the case in Michigan since both populations occur on private land. Sites with cherrystone drop snails also usually house other unique or endemic flora and fauna, and are subject to visitation and scientific collecting (Morse 1997).

Populations of this land snail are presumed to be fairly permanent, even in small areas, as long as the site remains undisturbed (Morse 1997). The most important requirement for conservation of this species is habitat protection. Maintaining intact tree canopy above snail sites seems essential (Nekola et al. 1996). At some sites, limiting the number of visitors and amount of recreational use, such as hiking at base of cliffs, may be necessary (Nekola et al. 1996, Morse 1997). In Michigan, since known populations occur on private land, conservation of these populations will require informing and working with private landowners.

Research needs: Systematic surveys for the cherrystone drop in the Upper Peninsula and potentially northern Lower Peninsula are warranted to try to document additional occurrences and determine the distribution of this species in Michigan. Research on the life history and ecological requirements of the cherrystone drop is needed to provide crucial information for conservation and management of this species. Studies to monitor and investigate the effects of various management practices, such as timber harvesting and designating streamside buffers, also are vital to ensure adequate protection of this and other land snails (Nekola 1998).

Related Abstracts: limestone pavement lakeshore, mesic northern forest

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