# SPECIES FACT SHEET

**Common Name:** Crater Lake tightcoil
**Scientific Name:** *Pristiloma arcticum crateris* (Lehnert, 1884)
Phylum: Mollusca
Class: Gastropoda
Order: Stylommatophora
Family: Zonitidae

**Technical Description:**
The BLM Field Guide for terrestiral mollusks (1999) states adults are about 2.75 mm in diameter and 1.5 mm in height. When alive, the shell is pinkish-buff in color, very glossy, and smooth. The periphery of the shell is rounded with the mid-whorl being the widest point. The 5.5-6.0 whorls are closely coiled with a low conic spire. The shell is imperforate with a crescent-shaped aperture that is somewhat flattened on the base in comparison to *Pristiloma arcticum arcticum.* Where the lip meets the columella, it becomes thickened and reflected. The lip is thin at the outer and basal margins. The base and peripheral region are almost completely smooth, and are slightly disrupted by weak lines of growth. On the upper surface, very fine, close spiral lines are present.

**Life History:**
Although specific reproductive biology of *Prisiloma arcticum crateris* is currently unknown, almost all small land snails are hermaphroditic and semelparous (i.e. breed once in a lifetime) (Frest and Johannes 1995). Unless conditions prohibit breeding, a majority of small land snails live only one year. If breeding is prohibited, some snails may over-winter so they may breed the following year. These small mollusks likely disperse in a passive manner: eggs and adults can be carried in mud particles by vertebrate vectors such as waterfowl and ungulates for long distances (Gowan and Burke 1999). *Prisiloma arcticum crateris* can be found at high elevation sites and remains unfrozen under snow when air temperatures are far below freezing. This may be due to biological "anti-freeze" compounds which are contained within its body fluids. This snail grazes on bacteria, fungi, yeasts and other microscopic organisms (microscopic periphyton) found of moist surfaces of green and decaying vegetation, rocks and wood. Where they occur, minute snails are often numerous and are probably key primary and secondary consumers in the biotic community. In performing such roles, they help with soil building as well as the dissemination of spores and perhaps other microbes.

**Range, Distribution, and Abundance:**
In Oregon, *P. arcticum crateris* occurs throughout the Oregon Cascades from Mt. Hood National Forest in the north to the Umpqua and Winema National Forests in the south at elevations exceeding 2000 feet in scattered wetland areas (Gowan and Burke 1999). This subspecies was first collected in 1928 by Junius Henderson from 1 mile (1.4 km) south of Crater Lake, in Crater Lake National Park, Klamath Co., Oregon. Allyn G. Smith collected this snail in July 1968 and July 1970 at Wizard Falls Fish Hatchery on the Metolius River, Jefferson Co., Oregon. *Prisiloma arcticum crateris* was collected by Terrence Frest and Edward Johannes in 1997 from the Thousand Springs area west of the park, south of Crater Lake National Park, and in the Upper Klamath Lake watershed. Immature specimens were found in the riparian zone of the

Bull Run River, Multnomah Co., Oregon in the spring of 1998. In the Deschutes, Winema and Umpqua National Forests, additional sites have been documented since 1998. Such sites tend to be on the western slopes of the Cascades, although some also occur at high elevations on eastern slopes. Approximately 160 sites are known for *P. arcticum crateris* thus far, with over 2/3 of them on the Deschutes National Forest. Although population density at these known sites has not yet been determined, most sites which are widely scattered across the species' range and separated by non-habitat, have only contained a few individuals. Presently, it is not known if this species is widespread but overlooked within its range, or if it highly locally endemic. It is likely that other populations occur, but they are currently unknown.

**Habitat Associations:**

*Pristiloma arcticum crateris* is usually found in non-acid fens or sedge habitats at elevations from 2750 to 6400 feet (838 to 1950 meters) above sea level (Gowan and Burke 1999). This species has been found in mature conifer forests and among rushes, mosses and other surface vegetation or under rocks and woody debris within 10 meters of open water in wetlands, springs, seeps and riparian areas which experience perennially moist conditions and long winters. The sites where Frest and Johannes (1995) found *P. arcticum crateris* were small openings such as "spring meadows" in generally undisturbed forests. Plant litter and natural porous soils provide some necessary cover for protection against excessive fluctuations in temperature and humidity, and also for hiding or escaping from predators. *Prisiloma arcticum crateris* is usually lacking in sites that have been grazed but may be found in spots missed by the livestock. Overstory vegetation shading the ground helps moderate temperature and moisture fluctuations of the overall habitat while understory vegetation is important for maintaining humidity and temperature at ground level. The plants provide organic matter which produces the microphytes which these snails and other invertebrates feed on, and provide litter and humus, while the roots help maintain porosity and texture in the soil. Humidity and cool temperatures in the litter and debris is maintained by shade and evapotranspiration from plants, which helps maintain the damp microhabitats of these snails, as well as their food sources.

**Threats:**

Gowan and Burke (1999) state one major threat to the species is the loss or degradation of wetland habitat leading to loss of populations at sites occupied by *P. arcticum crateris.* Activities which alter moisture availability, lower the water table, reduce litter and vegetative cover, compact soils, or impact potential food sources could pose a threat to the productivity and survival of this snail. Development or diversions of springs, grazing by livestock, using heavy equipment, off-road vehicles, and camping on occupied habitat are a few activities which could be deleterious to *P. arcticum crateris.* The habitat could also be degraded by log and woody debris removal from occupied habitats for firewood gathering, or by fire events. Many of the wetlands where this species is found are less than one acre in size, and do not receive the same riparian management as larger riparian habitats. Actions occurring some distance from the riparian area may have an adverse effect upon the hydrology. In addition, it may be necessary to determine whether the flow rate of the spring or the water table level will be affected by activities outside the riparian reserve. This species would also be affected if excessive fluctuations in ground temperature and humidity were allowed to occur as a result of removal of ground-shading overstory. Although the effects of fire retardant and other chemicals on small snails are not well-documented, such compounds may be deleterious, particularly when

dissolved in water. If the snow over occupied habitats is compacted, it looses its insulating properties and will allow the litter or ground to freeze. Activities which could induce such conditions include snowmobiling and skiing.

**Conservation Considerations:**

Gowan and Burke (1999) recommend that habitat areas should be protected from the use of heavy equipment, off-road vehicles, heavy livestock use, camping and other activities which could disturb habitat and injure these snails. Any activities, including surveys and monitoring, which could disturb sites should be limited to less than 5% of known habitat areas. Overstory and understory vegetation and litter and duff sufficient for ground shading must be maintained to minimize fluctuations in temperature and humidity. Logs and woody debris should be maintained, although their availability will depend on the overall plant community at the site. Large woody debris exceeding 1000 linear feet per acre is not excessive in lower elevation forested habitats. In habitats where woody debris is limited, trees could be felled where overstory is sufficient. Activities which cause soil compaction should be avoided since cover and insulation is provided by litter and porous soil. Activities which would lower the water table should be avoided since this could reduce soil moisture below levels necessary for this species, and possibly could lead to altered vegetative communities. Habitat areas should not be burned, and, where practical, be protected from wildfire. In heavily grazed areas, livestock should be excluded. Using techniques which do not expose these snails to potentially toxic chemicals, the prevention or control of noxious weeds should be enforced. Habitats should be closed to camping and off-road vehicle use, as well as the use of heavy equipment, and firewood gathering. Vegetation management objectives need to be modified to comply with the needs of these snails.

**Conservation Status:**

*Pristiloma arcticum crateris* is ranked globally G3G4T3 -- status is uncertain; rare, uncommon or threatened, but not immediately imperiled to apparently secure, but with cause for long-term concern (Oregon Natural Heritage Information Center 2007). In Oregon this species of snail is ranked S1-- critically imperiled due to extreme rarity or because it is somehow particularly vulnerable to extinction or extirpation. *Prisiloma arcticum crateris* is extremely rare in Oregon, and the sites which have been sampled have contained few individuals. Further sampling is critical to determine the current status of this species, since it is likely that additional populations may exist but have simply been overlooked. A wide range of human activities which could disturb habitat have a negative impact upon these snails, and since the current status is questionable, it is critical to maintain habitat until adequate sampling and monitoring has been performed.

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**Reviewed and edited by Rob Huff, Conservation Planning Coordinator, FS/BLM and Robin Vora, Deschutes and Ochoco National Forests, September 2010.**

## Information Sources:

BLM Field Guide. 1999. *Pristiloma arcticum crateris.* IN: A Field Guide to Survey and Manage Terrestrial Mollusk Species from the Northwest Forest Plan. Bureau of Land Management Oregon State Office. 57 pp.

Frest, T.J. and E.J. Johannes. 1995. Mollusk Survey of the Upper Klamath Drainage, Yearly Report Prepared for Oregon Natural Heritage Program. Deixis Consultants, Seattle, Washington. 274 pp. + Tables and Figures.

Gowan, D. and T.E. Burke. 1999. Conservation Assessment for *Pristiloma arcticum crateris,* Crater Lake Tightcoil. Originally issued as Management Recomendations October 1999 by Nancy Duncan. Reconfigured by N. Duncan in 2004. USDA Forest Service Region 6 and ISDI Bureau of Land Management, Oregon and Washington. 18 pp.

Oregon Natural Heritage Information Center. 2007. Rare, Threatened and Endangered Species of Oregon. Oregon Natural Heritage Information Center Institute for Natural Resources. Oregon State University, Portland, OR. Available Online (http://oregonstate.edu/ornhic/publications.html). 100 pp.