

# Washington Status Factors

**Elcode** IMGASB5840  
**Gname** OREOHELIX SP 1  
**Gcomname** CHELAN MOUNTAINSNAIL

## Number of Occurrences

B = 6 - 20

**Comments** This snail has been found at 14 sites, from about one fourth acre to 10 acres in size. The natural environment appears similar along the Columbia River south and westward to the Wenatchee River and for some distance northward into Okanogan County but, at this time, this species has not been found outside of the Entiat and Chelan Ranger Districts. Oreohelix sp 1 is a newly recognized, local endemic that has been found, living or dead, in about 10 locations (14 sites) from within an area of about 70,000 hectares (270 square miles, or 174,000 acres) in eastern Chelan County, Washington (Burke et al., 1999).

## Number of Occurrences with Good Viability

B = Very few (1-3) occurrences with good viability

**Comments** Seven of the 14 sites were destroyed in the 1994 Tyee Fire. As of January 1999, no living specimens have yet been found at those burned sites since that fire. The remaining 7 sites occur in 3 areas not burned in recent years. Five of these sites are from one-quarter to about three acres in size and occur within a quarter section of unburned Douglas-fir forest in Crum Canyon. One site has been found in Swakane Canyon, another forested drainage about 10.5 miles southwest of the first, and the original site (impacted by road reconstruction and condition not currently known) is approximately 20 miles to the north along the county road above Lake Chelan, in the Twentyfive mile Creek area. Of the above sites, two living populations of the Chelan Mountainsnail are currently known in Crum and Swakane Canyons, with a possible third at the original Lake Chelan site (Burke et al., 1999). During 1995c, biological surveys were done for fire recovery environmental assessments within the 1994 Tyee Fire area. During these surveys, shells resembling the Chelan Mountainsnail were found at eight locations. The shells from seven of those sites were confirmed to be of this species by Terrence Frest (personal communication, August 16, 1995). Known surviving populations of the Chelan Mountainsnail are rare, occurring in only two or three relatively small areas within the restricted range of the species (Burke et al., 1999).

## Population Size

A = 1-50 individuals  
B = 50-250 individuals

**Comments** Branson (1980) reported 8 "Oreohelix strigosa" (more likely to be the Chelan Mountainsnail) at Lake Chelan State Park. Terrence Frest (personal communication) recognized Oreohelix sp 1 as an undescribed species when he found it in the Twentyfive Mile Creek area, above the southwest shore of Lake Chelan. Shells confirmed as this snail by Frest (personal communication, 8/16/95) were found in 7 more locations by personnel of the Entiat Ranger District following the 1994 Tyee Wildfire. One shell from a nearby site on the Chelan Ranger District is similar to this species, but diverges enough to make its identification questionable. The two living populations in Crum and Swakane Canyons were found in the fall of 1997 and summer of 1998 (Burke et al., 1999). Only a few living individuals of this species have been found in recent years from 3 areas. Two of the areas contain only one known site, while the most populous area contains five small occupied sites in a quarter section of forested area. The other seven sites are known only from empty shells.

## Range Extent

C = 250-1,000 km<sup>2</sup> (about 100-400 square miles)

**Comments** Known only from northeastern Chelan County, Washington. It is also suspected to occur in parts of Okanogan County, Washington (Kelley et al., 1999). *Oreohelix* sp 1 is a local endemic of the eastern foothills of the Cascade Range in central Washington. Its known range covers about 70,000 hectares (270 square miles, or 174,000 acres) in eastern Chelan County, in the Entiat and Chelan Ranger Districts (Burke et al., 1999). Sites of current and past known occurrences are all scattered within an area roughly bounded by the Columbia River on the southeast, and following Lake Chelan northwesterly to include the Twentyfive Mile Creek drainage, then southwesterly to Tyee Mountain, then southerly to Chumstick Mountain, and following the ridge southerly and southeasterly to Burch Mountain, then southerly to the confluence of the Wenatchee and Columbia Rivers (Burke et al., 1999).

## Area of Occupancy

A = <0.4 km<sup>2</sup> (less than about 100 acres)

LA = <4 km (less than about 2.5 miles)

**Comments** Five of these sites are from one-quarter to about three acres in size and occur within a quarter section of unburned Douglas-fir forest in Crum Canyon. One site has been found in Swakane Canyon, another forested drainage about 10.5 miles southwest of the first, and the original site (impacted by road reconstruction and condition not currently known) is approximately 20 miles to the north along the county road above Lake Chelan, in the Twentyfive mile Creek area. Of the above sites, two living populations of the Chelan Mountainsnail are currently known in Crum and Swakane Canyons, with a possible third at the original Lake Chelan site (Burke et al., 1999).

## Long-term Trend in Population Size, Extent of Occurrence, Area of Occupancy, and/or Number or Condition of Occurrences

U = Unknown. Long-term trend in population, range, area occupied, or number or condition of occurrences unknown

**Comments**

## Short-term Trend in Population Size, Extent of Occurrence, Area of Occupancy, and/or Number or Condition of Occurrences

B = Very Rapidly Declining. Decline of 50-70% in population, range, area occupied, and/or number or condition of occurrences

C = Rapidly Declining. Decline of 30-50% in population, range, area occupied, and/or number or condition of occurrences

**Comments** Only a few living individuals of this species have been found in recent years from 3 areas (Burke et al., 1999).

## Threats

A = Substantial, imminent threat. Threat is moderate to severe and imminent for most (> 60%) of the population, occurrences, or area. Ecological community occurrences are directly impacted over a widespread area, either causing irreversible damage or requiring long term recovery

Scope High Severity High Immediacy High

**Comments** Because the Chelan Mountainsnail is known from few sites within a limited area, the range of environmental conditions it can tolerate must be considered to be narrow. Intense wildfire may be the greatest threat to their populations and habitats. Although these snails have evolved in a low intensity fire regime, high intensity fires may reduce their food below that needed for survival and/or cause changes in soil texture and moisture that cannot be tolerated. Even low intensity

burns that occur during spring or fall, when these snails are on the surface or in the litter, can be detrimental by directly killing small populations, or significant proportions of them. Other deleterious alterations to its habitat can result from forest and range management and recreation activities. Frest and Johannes (1995c) indicate talus removal, road construction and maintenance, logging, grazing, and wildfires to be threats. Threats to the species and its habitat also include: activities that compact or otherwise disturb the soil, or alter temperature or moisture regimes of the habitat (e.g., reduce shading, create or improve site drainage), or which create barriers to dispersal within populations or between nearby populations. Off-road vehicle activities would have a strong potential to threaten habitat or populations of this species, since the open grassy understory habitats are tempting playgrounds for trail bikes and 4-wheel drive vehicles. Moderate grazing is probably not a threat, but concentrations of livestock use on the occupied habitat sites would likely compact the soils, displace litter and duff, and remove vegetation needed to provide the litter for the following years' habitat. Because the occupied sites are so small, this may threaten the population and, because so few known populations survive, that could threaten species viability (Burke et al., 1999).

## Number of Appropriately Protected and Managed Occurrences

A = None. No occurrences appropriately protected and managed

**Comments** There are no known protected occurrences. All sites reported are on National Forest lands. The sites on the Entiat Ranger District are managed under Matrix/EW1 (mule deer winter range) and Matrix/GF (general forest resource extraction). Half of the known sites are also in the Entiat River Key Watershed (Burke et al., 1999).

## Intrinsic Vulnerability

A = Highly Vulnerable. Species is slow to mature, reproduces infrequently, and/or has low fecundity such that populations are very slow (> 20 years or 5 generations) to recover from decreases in abundance; or species has low dispersal capability such that extirpated populations are unlikely to become reestablished through natural recolonization (unaided by humans). Ecological community occurrences are highly susceptible to changes in composition and structure that rarely if ever are reversed through natural processes even over substantial time periods (> 100 years).

**Comments** Nearly all of the land snails in the Pacific Northwest, including the oreohelices, are hermaphroditic, having both male and female organs. Reproduction in the Oreohelix (subgenus Oreohelix) is viviparous (more probably ovoviviparous), in which the eggs hatch before leaving the uterus of the parent (Pilsbry, 1939; Bequaert and Miller, 1973). This is apparently an adaptation to arid climates where small, thin shelled eggs may not survive to hatch.

## Environmental Specificity

B = Narrow. Specialist or community with key requirements common.

**Comments** Preferred habitat is not well-defined. It was originally found in schist talus above the southwest shore of Lake Chelan. However, shells have been found at several sites with no apparent talus. Sites are near ridgetops, often in small draws, benches or depressions, and in open Ponderosa pine or Douglas-fir forest edge, with ground cover of pinegrass (*Calamagrostis rubescens*) or elk sedge (*Carex geyeri*) (Kelley et al., 1999). Frest and Johannes (1995c) reported: "This species is found associated with large-scale E-facing schist talus in Douglas-fir forest at a moderate elevation. Bryophytes, liverworts, and *Seligeria*, as well as *Physocarpus*, *Sorbus*, grasses, and *Heuchera* are frequent on the talus. Surrounding forest consists of mature to young *Pseudotsuga menziesii*, as well as a significant deciduous shrub and forb component. Associated large land snails include *Monadenia fidelis fidelis*." In summary, habitat for this species appears to be in arid transition forests (i.e., Ponderosa pine/Pinegrass-Bluebunch Wheatgrass, Douglas fir/Bearberry Bitterbrush, and Douglas-fir/Pinegrass-Elk Sedge plant associations) and sometimes a short distance into adjacent shrub/steppe communities. They are usually in the more mature stands, with relatively dense low vegetation understory (i.e., pinegrass, elk sedge), a good layer of litter and duff, and scattered shrubs (e.g., service berry), or in talus. They may be found between the litter and duff layers, under small or large woody debris

or on or between rocks imbedded in the ground. Elevation at the Twentyfive Mile site is 378 meters (1240 feet) (Burke et al., 1999).

## Other Considerations

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## Reasons

Severely declining in abundance and distribution; extirpated over much of its former range; very few new sites in many years.

## BCD Sources

## New Sources

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Burke, T.E., J.S. Applegarth, and T.R. Weasma. 1999. Management recommendations of survey and manage terrestrial mollusks. Ver. 2.0. Report submitted to USDI Bureau of Land Management, Salem, Oregon, October 1999. Unpaginated.

Frest, T.J. and E.J. Johannes. 1995c. Interior Columbia Basin mollusk species of special concern. Report to Interior Columbia Basin Ecosystem Management Project. 274 pp.

Kelley, R., S. Dowlan, N. Duncan, and T. Burks. 1999. Field Guide to Survey and Manage Terrestrial Mollusk Species from the Northwest Forest Plan. Bureau of Land Management, Oregon State Office, Portland, Oregon. 114 pp.

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