California Status Factors

Elcode IMGASG3380

Gname FLUMINICOLA SP 15

Gcomname FLAT-TOP PEBBLESNAIL

Number of Occurrences

A = 1 - 5

Comments It is known to occur at only 4 spring sites, on both sides of the Sacramento River at Shasta Springs and Mossbrae Falls (Frest and Johannes, 1993a; 1995c; Furnish et al., 1997).

Number of Occurrences with Good Viability

B = Very few (1-3) occurrences with good viability
C = Few (4-12) occurrences with good viability

Comments Rank unknown, but based on a few sites.

Population Size

U = Unknown

Comments

Range Extent

B = 100-250 km2 (about 40-100 square miles)

Comments Upper Sacramento River, Shasta County, California (Frest and Johannes, 1999; Furnish et al., 1997; Furnish and Monthey, 1999).

Area of Occupancy

B = 0.4-4 km2 (about 100-1,000 acres)
C = 4-20 km2 (about 1,000-5,000 acres)

LB = 4-40 km (about 2.5-25 miles)
LC = 40-200 km (about 25-125 miles)

Comments The species so far is an Upper Sacramento system endemic, known from 4 sites on both sides of the Sacramento River at Shasta Springs and Mossbrae Falls, in the upper Sacramento drainage in Shasta County, California (Frest and Johannes, 1999; Furnish and Monthey, 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 Unknown

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

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

Comments Unknown

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 Chemical spills and other forms of water pollution (e.g., livestock use of springs and channel bottoms) result in effects such as: (1) direct mortality of species as evidenced by the recent (1991) Cantara Spill on the Upper Sacramento River, and (2) deleterious habitat alterations resulting from factors such as eutrophication caused by excessive fertilization, reduced dissolved oxygen levels, or elevated water temperatures. Dam construction submerges cold springs, slows current velocities, lowers the availability of oxygen, and allows fine sediments to accumulate. Existing dams on the Sacramento River (e.g., Shasta Dam, and dams creating Whiskeytown Reservoir and Siskiyou Lake) and the Pit River by Pacific Gas and Electric have already caused extensive destruction of suitable habitat. Reductions in water flow by water diversions result in elimination or reduction of aquatic habitat for snails. Excessive sedimentation effects from a variety of activities such as logging, mining, road and railroad grade construction, and grazing may smother preferred substrates and may impair egg-laying or survivorship of eggs or young (Furnish and Monthey, 1999).

Number of Appropriately Protected and Managed Occurrences

A = None. No occurrences appropriately protected and managed

Comments There are no known protected occurrences. Known sites are on private lands, in some cases interspersed with extensive federal holdings; but most suitable habitat is in Shasta National Forest areas administered by Lassen National Forest, and Whiskeytown-Shasta-Trinity National Recreation Area. Management of nearby DCAs CD-64, 65, 66, 67, & 68 will likely impact this species in some areas (Frest and Johannes, 1999; Furnish et al., 1997; Furnish and Monthey, 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 Typically, members of the genus are dioecious (i.e., have separate sexes) and semelparous (i.e., breed only once in their lifetime and then die). Individuals have a life span of one year, with 90 percent or more of the population turning over annually. Surviving individuals are generally those that do not breed during their first year. Eggs are laid in the spring and hatch in approximately 2-4 weeks. Sexual maturity is reached by late summer, after a few months of growth. Individuals overwinter as adults and do not disperse widely, so populations remain very localized in their distribution (Furnish and Monthey, 1999).

Environmental Specificity

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

Comments Confined to small cold springs and spring sources; substrate ranges from sand to gravel (mostly gravel). Fluminicola sp 15 is a crenophile, occurring in small but perennial cold springs or at spring sources, mostly on gravel substrate. It appears to be a

perilithon grazer. May be associated with other endemic Fluminicola spp. or with Juga (Oreobasis) sp 3. A couple of springs with this taxon have abundant macrophytes, such as Rorippa and Mimulus; but it is not clear that these are necessary, as other sites have almost no larger water plants. Appears to be a perilithon feeder, like most small species (Frest and Johannes, 1999).

Other Considerations

Cited as Fluminicola n. sp. 3 in Frest and Johannes (1993b; 1995a).

Edition 11/27/2002 **Edauthor** Cordeiro, J.

Grank S1 **Grank Date** 11/27/2002

Greasons

Limited number of occurrences, with restricted range. There are no known protected occurrences.

BCD Sources

New Sources

Frest, T.J. and E.J. Johannes. 1993a. Mollusc species of special concern within the range of the northern spotted owl. Final report for the Forest Ecosystem Management Working Group. Deixis Consultants, Seattle, Washington. 39 pp.
Frest, T.J. and E.J. Johannes. 1993b. Freshwater mollusks of the Upper Sacramento System, California, with particular reference to the Cantara Spill. 1992 yearly report to California Department of Fish and Game, Deixis Consultants, Seattle, Washington. 1-1 pp.
Frest, T.J. and E.J. Johannes. 1995a. Freshwater mollusks of the Upper Sacramento System, California, with particular reference to the Cantara Spill. 1995 final report to the California Department of Fish and Game, Deixis Consultants, Seattle, Washington. 88 pp.
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.
Frest, T.J. and E.J. Johannes. 1999. Field Guide to Survey and Manage Freshwater Mollusk Species. Bureau of Land Management, Oregon State Office, Portland, Oregon. 117 pp.
Furnish, J., R. Monthey, and J. Applegarth. 1997. Survey protocol for terrestrial mollusk species from the Northwest Forest Plan. Version 2.0. Report to the USDI Bureau of Land Management, Salem, Oregon, October 29, 1997. Unpaginated.
Furnish, J.L. and R. Monthey. 1999. Management recommendations for aquatic mollusks. Ver. 2.0. Report submitted to USDI Bureau of Land Management, Salem, Oregon, December 1998. Unpaginated.