California Status Factors

Elcode IMGASG3110

Gname FLUMINICOLA SEMINALIS

Gcomname NUGGET PEBBLESNAIL

Number of Occurrences

C = 21- 80

Comments Fluminicola seminalis is moderately common in the Pit and McCloud Rivers and their tributaries. Frest and Johannes collected it from 32 sites, in a confined portion of the Pit drainage. However, in a recent survey of 231 sites in the potential area of occurrence, Frest and Johannes (1995c) reported that they could not locate it in the Upper Sacramento system. Presumably, this species was recently extirpated by the Cantara Bend herbicide spill.

Number of Occurrences with Good Viability

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

Comments Frest and Johannes (1995c) recorded densities for Fluminicola seminalis at 2000-3000 per square mile in the Pit and McCloud Rivers. Under such circumstances, it may constitute the major invertebrate biomass at a site (Furnish and Monthey, 1999).

Population Size

F = 10,000-100,000 individuals

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Range Extent

D = 1,000-5,000 km2 (about 400-2,000 square miles)
E = 5,000-20,000 km2 (about 2,000-8,000 square miles)

Comments Currently found in the Pit and McClound rivers, California. Formerly known from the mainstem Sacramento River in California, from its mouth upstream to Pit River, including large spring-fed tributaries (Taylor, 1981). Likely extinct from the mainstem Sacramento River (Hershler and Frest, 1996). Based on differences in shell characters, Hershler and Frest (1996) do not assign specimens from the San Joaquin River in California and Klamath basin to this species. Burch (1989), based on Pilsbry (1899), cites it as occurring in a few places in California and Oregon, but Hershler and Frest (1996) seem to restrict it to the Sacramento River basin of California. The specimens reported from Utah by Chamberlin and Jones (1929) were found to be Fluminicola coloradoensis by Hershler (1999). According to Hershler and Frest (1996), this species is a typical river-dwelling hydrobiid of the Upper Sacramento River system where it is endemic. However, in a recent survey of 231 sites in the potential area of occurrence, Frest and Johannes (1995c) reported that they could not locate it in the Upper Sacramento system. Presumably, this species was recently extirpated by the Cantara Bend herbicide spill. Flumninicola seminalis is moderately common in the Pit and McCloud Rivers and their tributaries. Frest and Johannes collected it from 32 sites, in a confined portion of the Pit drainage (Furnish et al., 1997; Furnish and Monthey, 1999).

Area of Occupancy

C = 4-20 km2 (about 1,000-5,000 acres)
D = 20-100 km2 (about 5,000-25,000 acres)

LC = 40-200 km (about 25-125 miles)
LD = 200-1,000 km (about 125-620 miles)

Comments Sacramento River and Pit River, including a few large spring-fed tributaries in northern California (Shasta, Modoc, and Lassen counties). A related species is present in parts of the western Klamath drainage, California (Frest and Johannes, 1999). Extinct over most of its former range in the Sacramento River, according to Taylor (1981) and T. Frest (personal observations). Appears to be extirpated in the upper Sacramento River (only 3 river miles unaffected after July, 1991 metam sodium spill into the river). Collected in the Pit River (California) system in Shasta County, California, including sites in the Shasta National Forest, and sites administered by Lassen National Forest. Known sites are in DCA OD-58; in DCA CD-82 and in or on the edge of DCA CD-81 (Frest and Johannes, 1999).

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

A = Very Large Decline (decline of >90%, with <10% of population size, range extent, area occupied, and/or number or condition of occurrences remaining)

Comments Historically, it has suffered from habitat degradation, so it is appropriate to protect surviving populations. Recent events like construction of dams, the spill of the herbicide metam sodium (Vapam) in the Cantara spill of 1991, and the Burney fire of 1992 and subsequent salvage logging, have caused significant impacts to the population. The species is now about 95 percent extirpated from its former range in the Sacramento River (USDA, Forest Service, and USDI, Bureau of Land Management, 1994b).

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

A = Severely Declining. Decline of >70% in population, range, area occupied, and/or number or condition of occurrences

Comments Historically, it has suffered from habitat degradation, so it is appropriate to protect surviving populations. Recent events like construction of dams, the spill of the herbicide metam sodium (Vapam) in the Cantara spill of 1991, and the Burney fire of 1992 and subsequent salvage logging, have caused significant impacts to the population. The species is now about 95 percent extirpated from its former range in the Sacramento River (USDA, Forest Service, and USDI, Bureau of Land Management, 1994b).

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 stream channels and springs, sewage contamination from recreation use) resulting in effects such as: 1. direct mortality of species as evidenced by the recent Cantara Spill (1991) on the upper Sacramento River, and 2. deleterious habitat alterations resulting from factors such as: eutrophication caused by excessive nitrogen and phosphorus levels, reduced dissolved oxygen levels, or elevated water temperatures. Dam construction that 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, dams creating Whiskeytown Reservoir and Siskiyou Lake) and the Pit River have already caused extensive destruction of suitable habitat. Reductions in water flow by water diversions resulting in elimination or reduction of aquatic habitat for this snail. Excessive sedimentation 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.

Number of Appropriately Protected and Managed Occurrences

C = Several (4-12) occurrences appropriately protected and managed

Comments No known protected occurrences. Frest and Johannes collected it from 32 sites, in a confined portion of the Pit drainage. Five of these sites are on federal land: 2 in the Shasta National Forest and 3 in the Whiskeytown-Shasta-Trinity National Recreation Area. All sites occupied by these snails should be protected (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 Fluminicola species, like most hydrobiid snails, are highly sensitive to oxygen deficits, elevated water temperatures, and sedimentation. F. seminalis is only found in river reaches and springs that have cold, well oxygenated, clear water, generally with cobble and/or boulder substrates. Any activities that degrade these parameters will adversely impact this species (Furnish and Monthey, 1999).

The life history traits of F. seminalis also put it at risk. Individuals apparently breed only once in a lifetime and then die. Usually 90 percent of the population turns over annually so any condition that impairs egg laying, or survivorship of eggs or young may result in extirpation.

Environmental Specificity

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

Comments Found in large creeks and rivers (Taylor, 1981); prefers well-oxygenated streams and stable gravel-boulder substrates, regardless of stream size, in the cited range. Generally found at low elevations. Often associated with Lanx patelloides and with a high diversity of other mollusks. Also occurs commonly in large limnocrenes; populations in such habitats are often small-sized (5-7 mm height) (Frest and Johannes, 1999). Fluminicola seminalis often co-occurs with Juga (Juga) occata, Juga (Calibasis) acutifilosa, Juga (Oreobasis) nigrina, and Lanx patelloides. It also commonly occurs with widely distributed species like Vorticifex effusa, Gyralus parvus and Physella gyrina (Furnish and Monthey, 1999).

Other Considerations

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Greasons

Severely declining in abundance and distribution; extirpated over much of its former range.

BCD Sources

New Sources

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