

RAMS-HORN VALVATA

TAXONOMY

Scientific name: *Valvata mergella* –
Westerlund, 1883

Common name: rams-horn valvata

Family: Valvatidae

Taxonomic comments:

The Valvatidae family is known as the valve snails, a primitive group basal to many other clades and with marine as well as freshwater representation.



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DESCRIPTION

Basic description: A freshwater aquatic snail.

General description:

Valve snails have small, flatly coiled to low conical or turbinata dextral shells; whorls are rounded and smooth with a high gloss, silky, or with low periostracal fringes or ridged whorls; horny operculum with many turns (multispiral). Tentacles are long and slender, gill external, bipectinate, and feather-like. Mouthparts include radula with seven teeth in each row. Teeth possess many cusps (Clarke 1981, Burch 1989).

Length (mm): to 5 (shell diameter)

Reproduction:

Valve snails are oviparous hermaphrodites; may self-fertilize eggs laid generally in spring or early summer (Aldridge 1983, Burch 1989, Hovingh 2004). Egg capsules are spherical and contain from 1 to 60 eggs. Developing embryos are green (Clarke 1981).

Ecology:

These tiny first-level consumers of diatoms and other plankton are preyed upon by fish and shorebirds. Associated mollusks include several sphaeriid species: *Sphaerium*, *Musculium*, and *Pisidium*, *Menetus* spp., *Gyraulus* spp., *Physella* spp., *Stagnicola* spp., *Planorbella* spp. and *Anodonta oregonensis* (Frest pers. comm.).

Migration:

Unknown.

Food:

A radular grazer on diatoms, single-celled and filamentous algae, bacteria, fungi, protozoans and other associated microscopic plants and animals attached to submerged

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hard surfaces such as rocks, wood, plants, and other debris (Aldridge 1983); most often detritivores on soft substrates (Frest pers. comm.).

Phenology:

Diel feeding cycles of freshwater prosobranchs have not been well documented, but available evidence suggests that the phenomenon is widespread (Aldridge 1983).

Habitat:

Freshwater rivers, streams, lakes, and kettle lakes; rarely in springs. Most often found on soft (oxygenated mud or silt) substrates, often with common macrophyte and other organic debris fragments; occasionally on harder substrates. Most common just beneath the surface (1 m to 3 m) in rather more open areas surrounding macrophyte beds (*Potamogeton*, *Chara* and *Elodea* spp.; Frest pers. comm.).

STATUS

Global rank: G2 (01Jun2000)

Global rank reasons:

Reported from sites in Washington, Alaska, and possibly occurs in British Columbia; only one site is left in Washington. Only about four sites reported in Alaska; and these need rechecking. Occurs in kettle lakes on the west side of the Cascades and the Coast Range. Rotenone treatment of lakes; recreational overusage; and urbanization effects on lakes are the major current threats.

State rank: S1 (26Jun2006)

State rank reasons:

Apparently rare species, known from about four (potentially six) sites in coastal freshwater systems; all occurrence records need re-checking. Abundance and trends unknown. Threats are likely minimal based on remoteness of known occurrences.

DISTRIBUTION AND ABUNDANCE

Range:

Global range:

Burch (1989) described the range as Alaska to Washington. Frest (1997 in Lee 2001) suggested this species may occur in British Columbia only near the coast, as it occurs in coastal Alaska and western Washington.

State range:

Reported from a few disjunct coastal freshwater sites in Alaska including Port Clarence on the Seward Peninsula and Popof Island in the Shumagin Islands (Frest pers. comm.). A fossilized specimen was collected at Onion Portage on the Kobuk River (date unknown; specimen ID: UAM Moll 6955).

Abundance:

Global abundance:

Unknown but likely rare; although many pristine lakes thought to be likely habitat for this species have been visited in Washington and British Columbia, *V. mergella* was not found except in one instance (Frest pers. comm.).

State abundance:

Unknown but likely rare; species has only been recorded at four (potentially six) sites in the state.

Trends:

Global trend:

Unknown.

State trend:

Unknown.

EXISTING PROTECTION

Global protection:

Unknown.

State protection:

No specific protection for this species, although much of its habitat in the state is likely in close to pristine condition.

CHALLENGES

Global challenges:

General threats to freshwater habitats include infilling, shoreline development, agricultural runoff, industrial pollution, recreational overusage, sediment inputs from adjacent or upstream activities such as range and forestry practices, and changes to native fish fauna or introduction of non-native aquatic predator species (Lee 2001). Riverine and stream habitats are additionally threatened by channel alteration practices and ground water pollution; lakes may be impacted by game fish stocking practices or by treatments to kill fish or aquatic macrophytes (i.e. rotenone poisoning; Lee 2001).

In Washington State, most lower elevation lakes have had their fish faunas modified by introduced taxa or have been treated with rotenone to control non-native taxa. In addition, many lakes have been treated to eliminate coon grass (*Ceratophyllum*) or other unwanted aquatic macrophytes. Many lowland lakes are favored home building sites, particularly in King, Snohomish, and Thurston; as a result, very few lowland lakes have surviving freshwater mollusk fauna. The only occurrence of *V. mergella* in Washington is a privately-owned kettle lake site in a rapidly developing area (Frest pers. comm.).

State challenges:

Threats are difficult to assess based on the few documented records of this species, the locations of which are disjunct and widely dispersed, and the fact that habitat preferences are unknown. Based on the species' association with freshwater habitats, potential threats could include stocking of predatory game fish and introduction of invasive mollusk species such as the zebra mussel (*Dreissena polymorpha*) or New Zealand mud snail (*Potamopyrgus antipodarum*), which have driven some freshwater mussel species to extirpation in other states (ADFG 2005). However, species habitat is likely in pristine condition and threats are minimal in Alaska.

RESEARCH AND INVENTORY NEEDS

Global research needs:

Baseline life history information is needed. Research is also needed on habitat associations and population dynamics.

State research needs:

Research needed on basic life history and habitat associations in freshwater habitats.

Global inventory needs:

An accurate assessment of population status range-wide is needed. Monitor known occurrences to identify trends and conduct surveys in adjacent areas with similar habitat to determine whether species is more wide-ranging than current documentation suggests. Although species is suspected to occur in coastal British Columbia, it has yet to be detected (Lee 2001). Re-survey Alaska occurrences to verify persistence of known populations.

State inventory needs:

Summarize existing museum records of species occurrence in Alaska. Re-survey Alaska occurrences to verify persistence of known populations. Conduct surveys in adjacent areas with similar habitats (coastal freshwater streams, rivers, lakes and kettle lakes) to determine whether species is more wide-ranging than current documentation suggests. Mollusk surveys could be combined with inventory of freshwater fish species.

CONSERVATION AND MANAGEMENT NEEDS

Global conservation and management needs:

See State conservation and management needs.

State conservation and management needs:

Documentation of persisting occurrence at locations where this rare species has been identified is a priority, and surveys of additional coastal freshwater habitats should be conducted. Determine population trends to better assess species' status, and protect known occurrences from habitat pollution/destruction and the introduction of non-native predator or competitor species.

LITERATURE CITED

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Acknowledgements

State Conservation Status, Element Ecology & Life History Author(s): McClory, J.G. and T.A. Gotthardt, Alaska Natural Heritage Program, Environment and Natural Resources Institute, University of Alaska Anchorage, Anchorage, AK, <http://aknhp.uaa.alaska.edu>.

State Conservation Status, Element Ecology & Life History Edition Date: 11Nov2005

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Life history and global level information were obtained from the on-line database, NatureServe Explorer (www.natureserve.org/explorer). In many cases, life history and global information were updated for this species account by Alaska Natural Heritage Program zoologist, Tracey Gotthardt. All global level modifications will be sent to NatureServe to update the on-line version.

NatureServe Global Conservation Status Factors Edition Date: 01Jun2000

NatureServe Global Conservation Status Factors Author: Frest, T.

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