Conservation Assessment
for
Lyogyrus n. sp. 2

Masked Duskysnail

Originally issued as
Management Recommendations
December 1998

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Revised
October 2005
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Preface:

Converting Survey and Manage Management Recommendations into Conservation Assessments

Much of the content in this document was included in previously transmitted Management Recommendations developed for use with Survey and Manage Standards and Guidelines. With the removal of those Standards and Guidelines, the Management Recommendations have been reconfigured into Conservation Assessments to fit Special Status/Sensitive Species Program (SSSSP) objectives and language. Changes include: the removal of terminology specific to Survey and Manage Standards and Guidelines, the addition of Oregon Natural Heritage Information Center ranks for the species, and the addition of USDA Forest Service and USDI Bureau of Land Management (BLM) Special Status/Sensitive Species status and policy. Habitat, range, and taxonomic information have also been updated to be current with data gathered since the Management Recommendations were initially issued. The framework of the original document is maintained in order to expedite getting this information to field units. For this reason this document does not entirely conform to recently adopted standards for the Forest Service and BLM for Conservation Assessment development in Oregon and Washington.

Assumptions about site management

In the Final Supplemental Environmental Impact Statement (FSEIS) and Record of Decision (ROD) to Remove or Modify the Survey and Manage Standards and Guidelines (USDA and USDI 2004), assumptions were made as to how former Survey and Manage species would be managed under agency Special Status Species policies. Under the assumptions in the FSEIS, the ROD states "The assumption used in the Final SEIS for managing known sites under the Species Status Species Programs was that sites needed to prevent a listing under the Endangered Species Act would be managed. For species currently included in Survey and Manage Categories A, B, and E (which require management of all known sites), it is anticipated that only in rare cases would a site not be needed to prevent a listing…Authority to disturb special status species sites lies with the agency official who is responsible for authorizing the proposed habitat-disturbing activity." This species was in Category A at the time of the signing of the ROD, and the above assumptions apply to this species' management under the agencies' SSSSP.

Management Considerations

Within the following Conservation Assessment, under the "Management in Species Habitat Areas" section, there is a discussion on "Management Considerations". "Management Considerations" are actions and mitigations that the deciding official can utilize as a means of providing for the continued persistence of the species' site. These considerations are not required and are intended as general information that field level personnel could utilize and apply to site-specific situations. Management of the species covered in this Conservation Assessment follows Forest Service 2670 Manual policy and BLM 6840 Manual direction. (Additional information, including species specific maps, is available on the Interagency Special Status and Sensitive Species website, www.or.blm.gov/isssp)

EXECUTIVE SUMMARY

Species: *Lyogyrus* n. sp. 2- undescribed, Masked Duskysnail

Taxonomic Group: Mollusk (Phylum Mollusca; Class Gastropoda; Subclass Prosobranchia; Family Hydrobiidae)

Other Management Status: *Lyogyrus* n. sp. 2 is a Forest Service Region 6 Sensitive species. Washington Natural Heritage Information Center gives this species Global ranking G1G2, State ranking S1 (critically imperiled both within the state and globally because of extreme rarity or because it is somehow especially vulnerable to extinction or extirpation).

Range: It is currently known from 4 sites in two kettle lakes: Curlew Lake in Ferry County, Washington, and Fish Lake, which is partially within Wenatchee National Forest, Chelan County, Washington. The Fish Lake site is in close proximity to LSR RW 135 (Chiwawa LSR).

Specific Habitat: *Lyogyrus* n. sp. 2 is a kettle lake inhabitant and riparian associate. It lives in lentic ecosystems on oxygenated mud substrates with aquatic macrophyte growth. It is a cool water, periphyton feeder (i.e., feeds on the algal and microbial film on aquatic macrophytes), and likely on detritus.

Threats: The major concern for this species is loss of populations due to alteration of the ecological conditions (e.g., dissolved oxygen, water clarity, water temperature, aquatic macrophyte, and algal growth patterns) that are apparently important for its persistence. The major threat is urbanization around the lakes, resulting in impacts such as water pollution from herbicides, pesticides and petroleum products, and eutrophication related to septic tank leakage and runoff of fertilizers and sediments. A potential threat is application of chemicals to control fish, insects, or aquatic plants. Other potential threats include water diversions for irrigation purposes and alteration of water temperature regime, although they may be less serious due to the large size of the lakes.

Management Considerations: Manage the ecological conditions (i.e., maintenance or enhancement of clean, clear water conditions) at documented sites. For example, modify human activities resulting in the introduction of septic tank leachate, sediments, oils, herbicides, and/or pesticides; and prohibit chemical applications to control fish, insects, or aquatic plants that could adversely affect these conditions.

Information Needs: Discovery of additional populations of *Lyogyrus* n. sp. 2 in areas identified as potential suitable habitat. Prioritize surveys in areas where management treatments or projects are scheduled or proposed.

I. NATURAL HISTORY

A. Taxonomic/Nomenclatural History

This species has not been formally described in the science literature, and there is no taxonomic/nomenclatural history for it. *Lyogyrus* n. sp. 2 is an undescribed, quite rare aquatic snail belonging to the family Hydrobiidae.

B. Species Description

1. Morphology

The following description of the genus *Lyogyrus* was taken from Burke (1994). As discussed by Burke (1994), Burch (1982) keys *Lyogyrus* as a subgenus of *Amnicola* with the following differences: 1. nuclear whorl of the shell small (0.29-0.36 mm diameter, as compared to 0.38-0.48 mm for subgenus *Amnicola);* 2. mantle diffusely shaded with pigment compared to heavily mottled with black in *Amnicola*; and 3. widely distributed in North America compared to widely distributed in eastern North America for *Amnicola*. Burch does not show consistencies in aperture shape or operculum either between or within the genera in his illustrations. Clarke (1981) described the operculum of *Lyogyrus granum* as ". . . brown, circular and multispiral as in *Valvata*." Of 2 *Amnicola* in his findings, he described the aperture of *A. limosa* as "ovate, narrower at the top, and with a thin callus on the parietal wall", but he neglected to describe the operculum. For *A. walkeri*, he said, "Aperture nearly round and attached to the penultimate whorl at the top and over only a short distance. . . Operculum thin, pale, and paucispiral." separated *Lyogyrus* from *Amnicola* in his key with "Operculum multispiral . . ." for *Lyogyrus* vs. "Operculum paucispiral . . ." for *Amnicola*. In his illustrations, (Pennak, 1978 Fig. 502, E & O), he shows *Amnicola* with a teardrop shaped aperture and *Lyogyrus* with a round aperture.

The following description of this species was taken from Frest and Johannes (1993) and from Burke (1994). The snail is very high-spired, about 4 mm tall, slightly brownish, with evenly convex whorls; it has a round, un-reinforced aperture margin, with up to 8 whorls as an adult. The operculum has an orangish spot near its middle. The operculum is large for the genus, up to 2 millimeters in length. The mantle color is light yellow, with black pigmentation forming a mask on the neck and around and between the eyes. The tentacles are light, with single distinct yellow bands when alive. The shell shape and pigment pattern are distinctive as compared to previously described forms. This species more closely resembles eastern U.S. species than do most of the recently discovered western species.

2. Reproductive Biology

Information on life history is very sparse, but the reproductive biology of *Lyogyrus* n. sp. 2 is probably similar to other Hydrobiid species that have been better studied. Typically,

members of the family are dioecious (i.e., have separate sexes) and semelparous (i.e., breed only once in their life time and then die), and 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.

3. Ecology

Since this undescribed species has not been studied, there is little information available on the ecology of the species. All hydrobiid snails have gills that makes them dependent upon dissolved oxygen in the water in which they live. It is a cool water, periphyton feeder (i.e., feeds on the algal and microbial film on aquatic macrophytes), and likely on detritus. Both lakes inhabited by this species are highly eutrophic with an abundant growth of aquatic macrophytes and algae. This may be an unhealthy situation for the species and current small colonies may represent remnants of past populations, but further studies on the basic ecology of the species are necessary for this determination. Individuals overwinter as adults and do not disperse widely, so populations remain very localized in their distribution. Major predators are probably amphibians, turtles, sculpins, and trout. Typically, many individuals may be infected with trematode parasites.

C. Range and Sites

The type locality has not been designated until the formal description is published. This species is rare and locally endemic to 2 kettle lakes on the periphery of the Columbia drainage in eastern and north central Washington, in areas heavily affected by Late Pleistocene glaciation. Curlew Lake is in Ferry County and Fish Lake is partially within the Wenatchee National Forest, Chelan County, Washington. The Fish Lake site is in close proximity to LSR RW 135 (Chiwawa LSR).

Frest and Johannes (1993) also noted the 1970s surveys by Clarke, who examined a number of Washington kettle lakes while finding only one site with this species; and earlier surveys by Henderson in the 1920s and 1930s, who examined many more kettle lakes without finding this taxon. Frest and Johannes (1993) reported they have recently begun surveying additional kettle lakes in Washington, Montana, and Idaho, with no success in finding additional sites for this species to date. No additional sites for this species have been discovered as of October, 2005.

The original distribution of this undescribed species was likely northern and central Washington on the east side of the Cascades east to the Rockies, in heavily glaciated valleys, in Pend d'Oreille, Stevens, Ferry, Okanogan, and Chelan counties. This taxon was also found in adjacent parts of the Idaho Panhandle and northwestern Montana with similar geologic history (Frest and Johannes 1993), however these sites are no longer extant.

D. Habitat Characteristics and Species Abundance

Information on life history is very sparse. *Lyogyrus* n. sp. 2 is a kettle lake associate. It lives in lentic ecosystems on oxygenated mud substrates with aquatic macrophyte growth. It prefers water with high dissolved oxygen at or near saturation levels, and water temperatures below 18°C (65°F). It is a periphyton feeder (i.e., feeds on the algal and microbial film on aquatic macrophytes), and may feed on detritus as well. It is found in association with aquatic macrophytes such as *Potamogeton crispus, Elodea, Myriophyllum spicatum, Ceratophylum densum,* and *Chara*. Sizable numbers of waterlogged deciduous leaves (especially *Alnus* and *Populus*) are always present. This species occurs with another rare endemic (*Amnicola* n. sp. 1) at one site. There is little information on species abundance. However, Clarke (see Burke 1994) reported in the 1970s that "an apparently new species of *Lyogyrus* was collected at Fish Lake about 10 miles north of Winston, Washington, but the population is dense and the lake appears to be in no danger of being damaged." This population has not been quantified in recent years to determine trends, but appears to be limited to a few areas of the lake margin.

II. CURRENT SPECIES SITUATION

A. Status History

Findings under the FEMAT assessment implied that, under the preferred alternative (Option 9), *Lyogyrus* new species 2 had a 50% chance of being well distributed across Federal lands, a 10% chance of being locally restricted (i.e., with significant gaps between populations), a 20% chance of being restricted to refugia, and 20% of being extirpated. The probability of remaining well-distrubuted considered that the historical distribution may have been similar to the current situation, and that restriction to a few kettle lakes may be the natural (well-distributed) condition. If additional surviving populations are discovered, as seems likely, the probability of a more favorable outcome might increase (USDA, 1994).

Lyogyrus new species 2 was a Survey and Manage Category A species because of its rarity and limited distribution. This species has a Global Heritage Rank of G1, described as critically imperiled with fewer than 20 known sites. The species has a State Heritage Rank of S1 in Washington, considered critically imperiled because of extreme rarity or because it is somehow especially vulnerable to extinction or extirpation. In 2004, it was designated a Sensitive species for Forest Service Region 6.

B. Major Habitat and Viability Considerations

Relatively little is known about this species. The major viability considerations for this species are its extreme rarity and loss of populations due to human activities (see Threats section) that impact the water quality and threats from introduction of exotic fish species.

Being an annual species, even temporary conditions which cause the loss of a population during a single year would also result in the loss of future populations at that site.

C. Threats to the Species

The major concern for this species is loss of populations due to alteration of the ecological conditions that are important for its survival (e.g., dissolved oxygen, water clarity, cool water temperatures, aquatic macrophyte and algal growth patterns). The major threats are urbanization, resulting in impacts such as water pollution from herbicides, pesticides and petroleum products, and eutrophication related to septic tank leakage and runoff of fertilizers and sediments. Introduction of exotic fish or plants to closed ecosystems such as these lakes also pose serious threats to snail population persistence, however the application of chemicals to control fish, insects, or aquatic plants also are likely to adversely affect the snails. Another potential threat is water diversion for irrigation purposes, although this threat is unlikely due to the large size of the lakes. Alteration of water temperature regime is also unlikely due to the large size of these lakes.

D. Distribution Relative to Land Allocations

One site is on private land (Curlew Lake) and the other site (Fish Lake) is partially within the Wenatchee National Forest, Chelan County, Washington. The Fish Lake site is in close proximity to LSR RW 135 (Chiwawa LSR). Forest Service lands that directly border Fish Lake are within a Riparian Reserve as specified by the Northwest Forest Plan.

III. MANAGEMENT GOALS AND OBJECTIVES

Management for this species follows Forest Service Region 6 Sensitive Species (SS) policy. For Forest Service Region 6, SS policy requires the agency to maintain viable populations of all native and desired non-native wildlife, fish, and plant species in habitats distributed throughout their geographic range on National Forest System lands. Management "must not result in a loss of species viability or create significant trends toward federal listing" (FSM 2670.32) for any identified SS.

IV. HABITAT MANAGEMENT

A. Lessons from History

Most large kettle lakes in northern Washington, Idaho, and northwestern Montana have been modified by human activity to some extent. According to Frest and Johannes (1993), these lakes have been heavily poisoned and stocked with fish, serve as preferred sites for human habitation, or have been used for irrigation, with resultant eutrophication and extirpation or reduction of the native mollusk fauna. Many such lakes now lack mollusk faunas or have very reduced, low-diversity, generalized faunas, even though

numerous dead shells of other taxa in lake sediments indicate diverse faunas in the past. Eutrophication problems have resulted in citizen complaints and initiation of cleanup programs in both lakes where this species occurs.

B. Identification of Species Habitat Areas

All known sites on federal lands administered by the Forest Service and/or BLM in Oregon and Washington are identified as areas where the information presented in this Conservation Assessment could be applied. Fish Lake within Wenatchee National Forest is the only currently identified site on federal lands.

A species habitat area is defined as the suitable habitat occupied by a known population plus the surrounding habitat needed to support the species at the site. For this species, the species habitat area would include the immediate area around known site locations, including the organic and physical habitat elements and substrates used by the species during its annual lifecycle, and also the body of water in which the site is located which provides the aquatic water quality at the site.

C. Management Within Species Habitat Areas

The objective of species habitat areas is to maintain habitat conditions such that species viability will be maintained at an appropriate scale, in accordance with agency policies.

In most cases, the Riparian Reserve Standards and Guidelines (RRSG) for buffer widths and meeting Aquatic Conservation Strategy (ACS) objectives will be sufficient for management within these areas. In situations where RRSG and ACS do not apply or are not considered sufficient (e.g., wetlands less than 1 acre, springs and seeps) consider applying the standards and guides for perennial stream widths to determine the size of the area. Where wind firmness is a problem, habitat area widths may need to be increased to protect species habitat conditions.

The following management considerations can be applied to species habitat areas. Effects occurring at a distance from species habitat areas which affect water quality, such as impacts to streams entering the lakes, should also be considered.

- Maintain appropriate water quantity (no rapid alterations in lake levels as determined on a site specific basis) and water quality (e.g., high dissolved oxygen at or near saturation levels, water temperatures below 18°C or 65°F).
- Maintain and/or restore native riparian plant communities that aid in maintaining cool water temperatures (i.e., below 18°C) by providing shade, increasing dissolved oxygen, reducing sedimentation impacts, and providing litter fall nutrients to energy pathways in the lake ecosystem.
- Maintain integrity of lakebed substrates by minimizing sedimentation (i.e., avoid smothering or disturbance of suitable mud substrates).

- Avoid or reduce the effects of human activities that result in water pollution, sedimentation, and eutrophication.
- Control populations of exotic species, avoid future introductions.
- Avoid chemical applications to control fish, insects, or aquatic plants.
- Avoid water diversions that could result in fluctuation of lake levels or alter ecological conditions necessary for continued sustainability of this species.

D. Other Management Issues and Considerations

Potential transplantation of this species into suitable kettle lakes within federal ownership may help to increase the distribution of this species, and to maintain populations that may otherwise be lost due to increased development around privately owned lakes.

V. RESEARCH, INVENTORY, AND MONITORING OPPORTUNITIES

The objective of this section is to identify opportunities for additional information that could contribute to more effective species management. The content of this section has not been prioritized or reviewed as to how important the particular items are for species management. While the research, inventory, and monitoring information is not required, these recommendations should be addressed by a coordinating body at the Regional level.

A. Data and Information Gaps

- Conduct surveys to locate populations of *Lyogyrus n. sp. 2* in areas identified as potential suitable habitat. Prioritize surveys in areas where management treatments or projects are scheduled or proposed.

B. Research Questions

- What are the dispersal mechanisms, and annual movements of this species?
- What are the specific habitat requirements of this species?
- How does this species respond to changes in water quality conditions?
- What is the species' tolerance to chemicals used to control exotic species?
- How would transplanted colonies of this species survive in other lakes?

C. Monitoring Recommendations

The 2 kettle lake populations should be monitored to measure the responses of these populations to continued threats.

VI. REFERENCES

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