

# Kansas Recovery Plan for the Slender Walker Snail, *Pomatiopsis lapidaria* (Say) In Kansas



Photo courtesy of Paul Lechtl, Kansas Biological Survey

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## I. Introduction

This plan addresses the recovery needs of the slender walker snail, *Pomatiopsis lapidaria* (Say). This invertebrate is known from only one location in northeastern Kansas, Atchison County. The species is currently listed as endangered in Kansas (K.A.R. 115-5-1).

This plan, as governed by K.A.R. 115-5-4, outlines specific strategies and methods to recover and eventually delist the slender walker snail.

## II. Species Accounts

### A. Slender Walker Snail, *Pomatiopsis lapidaria* (Say)

#### I. Taxonomy and Description:

The slender walker snail is a member of the genus *Pomatiopsis*, family Amnicolidae, subdivision Platypoda, division Taenioglossa, suborder Pectinibranchiata, order Prosobranchiata, class Gastropoda, Phylum Mollusca (Pratt 1935).

Pratt (1935) describes the slender walker snail as follows: shell slender, dark brown in color, and shining, with six whorls, 6.5 mm long and 3 mm wide. Franzen (1944) describes the slender walker snail as amber to dark brown, glossy, perforate, operculate, subconic shell consists of strongly inflated whorls regularly increasing in size toward the body whorl and separated by a sharply and deeply incised suture. The outer lip of the oval aperture is simple while the inner is somewhat reflected and continuous over the body whorl. The surface is marked with fine, microscopic vertical striations and is somewhat granular.

#### 2. Historical and Current Distribution

The only known population of this species in Kansas is located in a marsh, Muscotah Marsh, in Atchison County (T6S, RI7E, Sections 15 and 16) (Collins et al. 1995). The presence of the slender walker snail in Kansas was first reported by Franzen (1944). Interestingly, Frye et al (1943) reported the species in Pleistocene deposits of Russell County, Kansas.

The slender walker snail occurs commonly in the eastern United States (Pratt 1935) having a general distribution from New York to Iowa, Michigan, Wisconsin, south to Missouri, Alabama and Georgia (Baker 1928). Isolated populations have been found in Oklahoma and New Mexico and while common in the eastern United States, populations are represented by spotty occurrences (Liechti 1984).

### 3. Species Associations

Franzen (1944) found *P. lapidaria* living either on moist ground or low on stems and leaves of sedges, reeds and cattails. Ameel (1938) reported the species nocturnal but Franzen (1944) noted diurnal activity due to dense shading in the Kansas locale.

Franzen (1944) listed associated species as *Succinea haydeni*; Binney, *Triodopsis multilineata algonquinensis* Nason, and *Stenotrema monodon aliciae* (Pilsbry). While Baker (1928) lists *P. lapidaria* as amphibious, Liechti (1984) discusses that the snail is never found submerged except by ephemeral events. Snails of this species can remain submerged for several days but prefer terrestrial conditions with relative humidity conditions nearing saturation for most of its life (Liechti 1984).

### 4. Population Size and Abundance

Franzen (1944) listed *P. lapidaria* as being found in considerable numbers in the Muscotah Marsh. Liechti (1984) conducted transect analyses in the marsh and determined a mean density of 1,255 individuals per square meter in raised portions of the marsh. The marsh is fed by artesian flow which formed raised portions. It appears that these raised portions provide suitable habitat for the slender walker snail with populations within the marsh showing a clumped distribution. Dundee (1987) found clumped distributions in Michigan populations.. Liechti (1984) found no seasonal variation in populations.

### 5. Reproduction

*P. lapidaria* has been found to live at least 2.5 years (Dundee 1957). Sexes are distinct in this species with a ratio of three females to one male typically found in populations. Eggs are laid individually on sod. Dundee (1957) found a single female to lay 42 eggs after a single mating with all eggs hatching. Reproduction in Michigan can start as early as mid-March and end of October (Vander Schalie and Dundee 1959). No data is available for reproduction in Kansas populations.

### 6. Food and Feeding Requirements

"Like most gastropods, the slender walker snail is omnivorous, feeding on a wide variety of plant and animal substances, dead or alive" (Collins et al. 1995). No specific studies on feeding were located.

## III. Ownership of Species Habitats

Ownership of the Muscotah Marsh is privately held. The marsh has been the topic of various types of studies through the years. The Muscotah Marsh is a

permanent wetland found wholly within two sections of property. Liechti (1984) lists landowners in his acknowledgments section.

#### IV. Potential Threats to the Species or Their Habitats

Collins et al. (1995) indicates that the species could be quickly eliminated through dewatering or severely degraded through pollution; overcollecting might adversely affect populations. Because the species is so restricted (one locale in Kansas) any adverse action could impact the species and result in the loss of this representative of the State's fauna. Groundwater pumping eliminating artesian flow would effectively dewater the marsh and increase variability of environmental conditions resulting in probable elimination of *P. lapidaria*. Potential land use changes, overgrazing, contaminated runoff from possible agricultural activities could all eliminate the species and or its preferred habitats.

### V. Protective Laws

#### A. Federal

A number of federal laws may be of use in the protection of these species and their habitats. Most notably the U.S. Army Corps of Engineers administer a permit program under Section 404 of the Clean Water Act. This governs fill placed in stream realignment projects. Section 401 of the Clean Water Act provides for state review of water quality impacts from such activities and while authorized by federal law is administered by the Kansas Department of Health and Environment (KDHE). KDHE also issues NPDES permits from point source discharge. The U.S. Fish and Wildlife coordination Act provides for review and comment of both state and federal agencies concerning fish and wildlife impacts for any federal or nonfederal project which is approved by a federal agency that serves to impound, deepen the channel of, or otherwise control, pollute, or modify waters of the U.S. for any purpose whatsoever. Other federal laws may be relevant in specific instances. For review of applicable major federal laws affecting Kansas fish and wildlife, see Layher (1985).

#### B. State

##### 1. Permitting Requirements

Several state statutes, regulations and procedures may be invoked related to habitat alteration. K.A.R. 115-5-1 and 2 list species, which are declared to be threatened and endangered. K.A.R. 115-15-3 provides a permit system including review of habitat alterations. The permit program and review system is administered by the Kansas Department of Wildlife and Parks. This allows for the critical review of projects potentially affecting fish habitats. Based upon the review, projects may be accepted, modified, or revoked.

Various permit requirements of other agencies require permits if such developments alter stream discharges; request dam

construction, or alter streams and/or floodplains. Most such requirements come under the scrutiny of the Division of Water Resources of the State Board of Agriculture. Permits applied for though this office are sent out to be reviewed by KDWP as a result of the Water Projects Coordination Act, which was designed to simplify the state's overall permitting systems and allow fish and wildlife interest review. Projects identified as potentially impacting a threatened or endangered species would require an appropriate permit as well as from KDWP.

KDWP has entered into several Memorandum of Understandings (MOU's) with other agencies, notably the Kansas Department of Transportation, which aids in the identification of road and bridge projects in areas with threatened or endangered species. This MOU has been in force for years and was recently revised February 2002.

Many other permit systems may be activated through a variety of agencies. For a comprehensive review see Mondo et al. (1992).

## 2. Critical Habitat Designation

The Kansas Department of Wildlife and parks has designated the following locations as critical habitat for the slender walker snail: All wetlands and their contiguous drainageways lying within the west half of Sec. 15 and that portion of Sec. 16 east of the left bank ordinary high water mark of the Delaware River, Township 6 South, Range 17 East, Atchison County, Kansas.

## VI. Recovery Criteria

### A. Additional Species Information Needs

#### 1. Biology/Life History

The life history aspects of the slender walker snail in Kansas are largely unknown. Studies need to be conducted to determine microhabitat preferences within Muscotah Marsh. Liechti (1984) reported population estimates in only isolated portions of the marsh but noted a need to identify population levels in other portions of the marsh. Little is known regarding reproduction of the Kansas population. A complete life history study should be conducted including habitat preferences as related to plant species. A recent population analysis is needed as the most recent studies on the marsh were made nearly two decades ago.

### B. Management Activities for Maintaining Species Populations and for Species Recovery

#### 1. Attempts should be made to protect properties with slender walker snail populations. Various alternatives are possible:

- a. develop a conservation plan for the farm inclusive of the critical habitats. KDWP, Kansas Biological Survey, and county conservation district personnel, and NRCS staff should confer with each other and landowners to discuss all possible programs that the landowner could utilize to protect the marshes and provide landowner benefits. Such programs as EQIP, CRP, WHIP, and others should be evaluated;
- b. develop a conservation easement plan by which the landowner could donate an easement to protect the natural marsh area and receive income tax deductions.. Easements donated in perpetuity are eligible for federal income tax reductions, and easements become part of the deed and are passed on to future owners. Landowners retain rights to trespass, reasonable uses, and other options as defined in the legal document. States agencies (KDWP) or nonprofit groups such as the Nature Conservancy can accept conservation easements;
- c. purchase properties inclusive of the Muscotah Marsh and manage for maximum benefit to the slender walker snail.

2. Identify areas for possible introduction of the species. As *P.*

*lapidaria* is currently confined to one locale, it is extremely vulnerable to adverse impacts of man induced habitat alterations, especially with no control over land management decisions. Introducing the species to as many as five new locales in the state would insure that the species and its genetic forms would survive even if one population was extirpated. Areas for introduction should be based on similar microclimates as found in Muscotah Marsh. As artesian wetlands appear to be sites with optimal habitats, such areas might be considered. Wetlands around Scott Lake, artesian springs near Meade Hatchery, McKinney Marsh in southeast Kansas, and other areas might be examined for introduction possibility.

**C. Information and Educational Programs for Public and Private Lands**

- 1. As the slender walker snail exists only on a limited private lands, information can be directly relayed to the few landowners involved.
- 2. If the species is introduced to new wetland locales, brochures could be provided to wetland users to be made aware of the unique fauna. .
- 3. Introduction sites could be monitored by school classes (i.e. high school biology class/club) to assess success. This could be a high

profile effort for public relations utilizing various media to publicize recovery efforts.

#### D. Downlisting and Delisting Criteria

*P. lapidaria* is considered endangered primarily due to being found at only one location in the state. Any form of major habitat alteration could result in extirpation. If existing habitats, i.e. Muscotah Marsh, is protected by any of the alternatives VI. B. 1., the species should be downlisted from endangered status to threatened. While still only to be found at one location, at least the habitat would be protected from direct man-induced alteration.

*P. lapidaria* should be introduced to five sites in various regions of the state. Introductions should be monitored. If the species proliferates and become established in three new locales and persists for five years, the species could be downlisted to SINC status as events that may impact one site would not affect other sites. If populations continue to flourish for ten years, the species could be removed from all lists.

### VII. Costs for Recovery Plan Implementation

Life history studies recommended to be completed under Section VI. A. 1. could be completed for approximately \$15,000 through local university graduate programs.

Management strategies outlined in Section VI. B. 1. would result in varying costs. Alternative a. would require no "new" funds, but could be funded as part of existing governmental programs. Alternative b. would require no funds as the landowner would receive benefits through income tax reductions. Purchasing property, as recommended in alternative c. would require at least fair market values for comparable land types in the area. This alternative is the most costly of the three options proposed.

Locating and evaluating introduction sites could be accomplished with existing KDWP staff, or contracted out, depending on the evaluation methods utilized. Done "in-house," evaluation and introduction could be performed through existing salaries. To contract such efforts, costs may reach \$10,000 to \$15,000 for site evaluation and collection and introduction. Monitoring of introduction success could be nominal if schools are used. To contract such evaluations would require expenditures of approximately \$10,000 for population analyses.

### Literature Cited

- Ameel, D.J. 1938. Observations on the natural history of *Pomatiopsis lapidaria* Say. Amer. MidI. Nat. 19(3): 702-705.
- Baker, F.C. 1902. Mollusca of the Chicago area, Part II, the gastrapoda. The Chicago Academy of Sciences, Bull. No. III, of the Natural History Survey, April 25.
- Baker, F.C. 1928. The fresh water mollusca of Wisconsin, Part I, Gastrapoda. Wisconsin Academy of Sciences, Arts and Letters.
- Collins, J.T., S. Collins, J. Horak, D. Mulhern, W. Busby, C.c. Freeman, and G. Wallace. 1995. An illustrated guide to endangered or threatened species in Kansas. Univ. Press of Kansas, Lawrence, Kansas. 140 pp.
- Dundee, D.S. 1957. Aspects of the biology of *Pomatiopsis lapidaria* (Say). Misc. Publ. Mus. Zool., Univ. Michigan No. 100: 1-37.
- Franzen, D.S. 1944. New state records of mollusca from Kansas. Trans. Kansas Acad. Sci. 47(2): 261-273.
- Frye, John C., Leonard A. Byron, and Claude W. Hibbard. 1943. Westward extension of the Kansas 'Equus Beds', The Journal of Geology, Vol. LI, No.1, Jan-Feb., pp. 33-47.
- Liechti, Paul M. 1984. Population study of *Pomatiopsis lapidaria* (Say), a small amphibious snail of endangered status in Kansas. Kansas biological Survey (KU No. 5054-705). 18 pp.
- Pratt, H.S. 1935. A manual of the common invertebrate animals, exclusive of insects. P. Blakiston's Son and Co., Inc., Philadelphia. pp.616-625.
- Van der Schalie, H. and D.S. Dundee. 1959. Transect distribution of eggs of *Pomatiopsis lapidaria* Say, an amphibious prosobranch snail. Trans. Amer. Micros. Soc. 78: 409-420.