

Rocky Mountain Capshell Snail

Species Conservation Assessment Update

Title of Assessment: Rocky Mountain Capshell Snail (*Acroloxus coloradensis*): A Technical Conservation Assessment, USDA Forest Service, Rocky Mountain Region

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Update Author: John Sovell

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Update Summary: Research on this species since publication of the original assessment has resulted in changes to the species known distribution. A population of *Acroloxus coloradensis* is documented in southwestern Alberta, Canada approximately 500 km (310 mi) south of the populations reported in Alberta in the original assessment. In one recent report researchers report that Rocky Mountain capshell limpets appear insensitive to fish predation, but they recommend *A. coloradensis* populations be protected by returning any stocked lakes back to their historical fishless condition (where fish were not present historically), and that wading and swimming by recreationists be carefully managed or eliminated in areas of a lake that are populated by capshells. The comprehensive wildlife conservation plan of Colorado was published and it formally recognizes *A. coloradensis* as a species of conservation priority.

Distribution: New Information

References: New References

Taxonomic Status: Unchanged

Agency Status: Nominated as a Candidate Species in 1992; denied in 1994

Other: See below

Significance of Changes Relative to Original Assessment: One new population of *Acroloxus coloradensis* has been discovered outside of Region 2 since the publication of the original assessment, but there are no newly discovered populations within Region 2. The description of the range of the species presented in the assessment is unchanged because the new occurrences are within the known range of the species. Information in one report addressed in this addendum suggests that fish predation on *A. coloradensis* is a threat that requires management action. Recreational impacts may also need to be addressed to properly manage for this species. Since the publication of this species assessment this snail has been recognized by the State of Colorado in the states Comprehensive Wildlife Conservation Strategy Plan as a species of conservation priority, which could result in opportunities for pursuing funding to support future conservation activities of the species including management, protection, and research. The concepts and issues addressed in the original assessment are still pertinent and the new information presented here does not warrant a revision of the original assessment at this time.

Positive Findings of New or Updated Information and Their Sources

(Note: The Table A checklist attached to this update provides a summary of all sources consulted)

Source 1

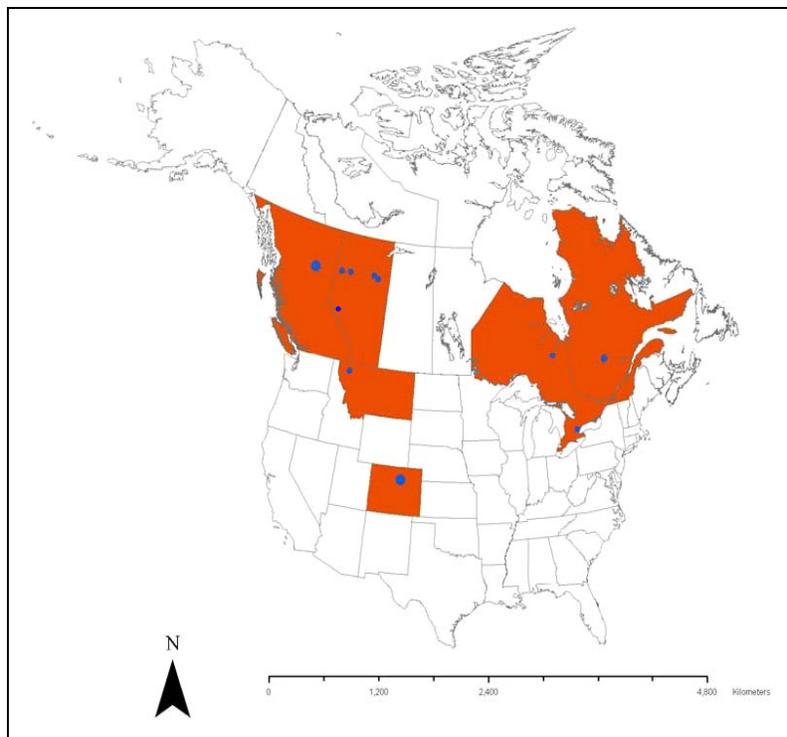
Ellis, B. K., L. Marnell, M. A. Anderson, J. A. Stanford, C. Albrecht and T. Wilke. 2004. Status and ecology of a glacial relict mollusk, the Rocky Mountain capshell limpet (*Acroloxus coloradensis*), in relation to the Limnology of Lost Lake, Glacier National Park, Montana (USA). Open File

Report 186-05. Prepared for National Park Service, Glacier National Park, West Glacier, Montana by Flathead Lake Biological Station, The University of Montana, Polson, Montana. 63 pp.

Summary of New Information

This report focuses on the habitat characteristics of *Acroloxus coloradensis* at Lost Lake in northern Montana. Although most of the habitat information is similar to past reports on the habitat affinity of *A. coloradensis* (see Riebesell et al. 2001) there is information of interest to the technical conservation assessment for this species, particularly information that pertains to the distribution and threats of the species.

Location information is reported for a population of *A. coloradensis* from southwestern Alberta (outside the administrative boundary of Region 2) that was not reported in the original assessment. *Acroloxus coloradensis* was collected from an unnamed lake in Jasper National Park (118.2228° W, 52.8737°N) and these specimens were used for the genetic analyses presented in this report (see figure below). The population in Jasper National Park is approximately 500 km (310 mi) further south than any of the populations reported in Alberta in the original assessment.



Updated distribution map of the known modern range of *Acroloxus coloradensis*.

Historically fishless, Lost Lake, like many other potential capshell habitats in the Rocky Mountains, has a long legacy of trout (Salmonidae) stocking and heavy use by recreationists for fishing, wading, and swimming. The authors cite an unpublished report identifying that capshells have been found in trout guts at Lost Lake. This research indicates that Rocky Mountain capshell limpets are insensitive to fish predation at Lost Lake. The authors recommend that *A. coloradensis* populations be protected by returning stocked lakes back to their historical fishless condition, and that wading and swimming by recreationists be carefully managed or eliminated in areas of a lake populated by capshells.

The authors used genetic data to infer phylogenetic relationships between *Acroloxus coloradensis* from Lost Lake and a neighboring lake and related genera in southern Alberta and Lake Baikal in Russia. The authors concluded that no genetic variation was demonstrated among the Rocky Mountain populations they selected for analysis (see figure above) and that the Acroloxiidae are

monophyletic, with *A. coloradensis* comprising a sister-taxon to the Lake Baikal endemic genera *Gerstfeldtiancylus*, *Baicalancylus*, and *Pseudancylastrum*.

Relevant Sections of the Conservation Assessment Affected by the Updates

Distribution and abundance - Figure 2. Known modern range of *Acroloxus coloradensis*, Predators, Fisheries management, Non-motorized recreation, implementation and potential conservation elements, and Population and habitat management approaches.

Source 2

Colorado Division of Wildlife. 2005. Colorado Comprehensive wildlife conservation plan: including references to wildlife action plans. Colorado Division of Wildlife, Denver.

Summary of New Information

The comprehensive wildlife conservation plan of the State of Colorado formally recognizes *Acroloxus coloradensis* as a species of conservation priority. The Comprehensive Wildlife Conservation Strategies (CWCS) are related to the State Wildlife Grants (SWG) program (Public Law 107-63), which provides federal dollars on an annual basis to every state and territory to support cost-effective conservation aimed at preventing wildlife from becoming endangered. Congress created the SWG program in 2001. United States laws and policies place the primary responsibility for wildlife management in the hands of the states. State fish and wildlife agencies have a long history of success in conserving game species, thanks to the support of hunter and angler license fees and federal excise taxes. But 90 percent of our nation's wildlife is not hunted or fished. The result? There is a serious gap in wildlife conservation funding, and thousands of species are falling through the cracks.

State Wildlife Grants fill that gap by supporting projects that prevent *all wildlife* from declining to the point of being endangered. Projects supported by this program protect and restore important lands and waters, collect information on what kinds of wildlife are in trouble, and develop partnerships with landowners to protect declining species and habitats on public and private lands. By emphasizing a proactive approach, the State Wildlife Grants program helps us take action to protect wildlife and habitats before they become too costly too rare and costly to protect.

In order to make the best use of the State Wildlife Grants program, Congress charged each state and territory with developing a statewide wildlife action plan. These proactive plans, known technically as "comprehensive wildlife conservation strategies," identify species and habitats of greatest conservation need and outline the steps needed to conserve all wildlife and vital natural areas for future generations. The U.S. Senate Interior Appropriations Committee appropriated \$67.5 million for the State Wildlife Grants Program in FY07. Funds appropriated under the SWG program are allocated to every state according to a formula based on each state's size and population. Colorado has received approximately \$1.25 million in annual funding since 2001 from the SWG program. Formal recognition of a species on a States CWCS plan results in opportunities for researchers to solicit funds from state fish and wildlife agencies to conduct conservation work on that species.

Relevant Sections of the Conservation Assessment Affected by the Updates

Status, Management Status, Management Plans, and Conservation Strategies.

Source 3 and 4

Joergensen, A.; T. K. Kristensen, and J. R. Stothard. 2004. An investigation of the "Ancyloplanorbidae" (Gastropoda, Pulmonata, Hygrophila): preliminary evidence from DNA sequence data. *Molecular Phylogenetics and Evolution* 32(3) 778-787.

Walther, A. C., T. Lee, J. B. Burch, D. Ó Foighil. 2006. *Acroloxus lacustris* is not an ancyloid: A case of misidentification involving the cryptic invader *Ferrissia fragilis* (Mollusca: Pulmonata: Hygrophila). *Molecular Phylogenetics and Evolution* 39 (2006) 271-275.

Summary of New Information

Genetic analysis by Joergensen et al. (2004) identifies the genus *Acroloxus* as a member of the ancyloplanorbids, or the families Ancyliidae and Planorbidae. If supported by future genetic research this could lead to a taxonomic revision of this group resulting in the elimination of the family Acroloxidae and placement of the genus *Acroloxus* into the family Ancyliidae.

Subsequent research by Walther et al. (2006) suggests that the conclusions of Joergensen et al. (2004) are based upon the misidentification of a new morphological strain of *Ferrissia fragilis*, and ancyliid, as *Acroloxus lacustris*. The genetic material was then analyzed, placing this misidentified specimen into the family Ancyliidae within which the genus *Ferrissia* resides. Walther et al. (2006) conclude that the genus *Acroloxus* does indeed represent a unique family, the Acroloxidae.

Relevant Sections of the Conservation Assessment Affected by the Updates

Systematics and general species description.

Additional Unabstracted References

(citations that predate the publication of the original assessment but were not referenced in the original assessment. These were collected opportunistically during the update and review process)

- Clarke, A. H. 1981. The Freshwater Molluscs of Canada. National Museum of Natural Sciences, National Museums of Canada, Ottawa, Ontario.
- Garza, J. B., J. L. Miller, and H. M. Tyus. 1993. Endangered and threatened wildlife and plants; commencement of status review and notice of findings on a petition to emergency list the Rocky Mountain Capshell as an Endangered Species. Federal Register 58:FR 28543.
- Lee, J. S. and J. D. Ackerman. 2000. Freshwater Molluscs at Risk in British Columbia: Three Examples of "Risk". In: L. M. Darling, editor, Proceedings of a Conference on the Biology and Management of Species and Habitats at Risk, Kamloops, B.C., 15 - 19 Feb., 1999. Volume One.
- Mozley, A. 1930. Reports of the Jasper Park Lakes investigations, 1925–26. The Mollusca of Jasper Park. Transactions of the Royal Society of Edinburgh 56:647–669.
- Schulz, T., C. Moritz, C. Pague, T. Guthrie, D. Chadwick, and B. Neely. 2004. Southern Rocky Mountains Ecoregional Assessment and Conservation Blueprint Refined Conservation Goals Analysis. The Nature Conservancy. Accessed 2 August 2006 at <http://conserveonline.org/docs/2002/02/SRMgoals.pdf>.
- Rumsey, C., M. Wood, B. Butterfield, P. Comer, D. Hillary, M. Bryer, C. Carroll, G. Kittel, K.J. Torgerson, C. Jean, R. Mullen, P. Iachetti, and J. Lewis. 2003. Canadian Rocky Mountains Ecoregional Assessment, Volume Two: Appendices. Prepared for The Nature Conservancy and the Nature Conservancy of Canada.
- Frest, T. J., and E. J. Johannes. 1995. Interior Columbia Basin Mollusk Species of Special Concern. Final Report, Contract #43-0E00-4-9112, Interior Columbia Basin Ecosystem Management Project. Deixis Consultants, Seattle, Washington. Accessed 2 August 2006 at http://www.icbemp.gov/science/frest_1.pdf.
- Pierce, H. 1990. Two unusual gastropods from late Pliocene lakes in northeast Nebraska USA. Nautilus 104(2): 53-56.
- Russell, R. H. and R. B. Brunson. 1967. *Acroloxus coloradensis* from Montana. Nautilus 81:33.
- USDA Forest Service. 2005. Biological Evaluation and Assessment for the Winter Recreation Management Environmental Assessment, Medicine Bow-Routt National Forest. Accessed 2 August 2006 at http://www.fs.fed.us/r2/mbr/projects/rec/adobepdf/winter_rec_appendix_e_final_babe.pdf.

- USDA Forest Service. 2003. Medicine Bow National Forest revised land and resource management plan final environmental impact statement. Accessed 2 August 2006 at http://www.fs.fed.us/r2/mbr/projects/forestplans/mb/eis_apps/final_eis_app_i_babe.pdf.
- USFWS. 1994. Endangered and Threatened Wildlife and Plants: Animal Candidate Review for Listing as Endangered or Threatened Species; Proposed Rule. Federal Register 56:58982–59028.
- USFWS. 1994. Endangered and Threatened Wildlife and Plants: Notice of Finding on a Petition to Emergency List the Rocky Mountain Capshell as an Endangered Species Throughout Its Range. Federal Register 59.
- Walker, B. 1925. New species of North American Ancyliidae and Lancidae. University of Michigan, Occasional Papers of the Museum of Zoology No. 165, 13 pp.

Checklist of Sources Consulted for Updates to the Rocky Mountain Capshell Snail Conservation Assessment

Guidelines for Producing Updates

Sources of information relevant to review of this Technical Conservation Assessment for updates include databases, experts, personal communications, published and unpublished literature. Positive results are discussed in detail in the Summary of Addendum to the Technical Conservation Assessment.

Internet Literature Searches: The minimal search for each update consists of Google Scholar, Federal Register, plus a minimum of three other available online literature databases. Search terms include at a minimum: species common name, genus, and recent synonyms. Other keywords will be used at the discretion of the updater (e.g., passerine, wetland, rodent). Searches will be constrained to the time beginning two years prior to publication of the Technical Conservation Assessment to the present.

Table A. Sources of information consulted for updates to the Species Conservation Assessment.

Source Category	Source/ Name	Date	Results
Internet based literature databases	Google	8/2/2006	Three new sources for search term " <i>Acroloxus coloradensis</i> ". None reviewed.
	Google Scholar	8/2/2006	Two new sources for search term " <i>Acroloxus coloradensis</i> ". None reviewed.
	Federal Register	7/24/2006	No mention for the search terms " <i>Acroloxus coloradensis</i> " and " <i>Acroloxus</i> ".
	Biological Abstracts	8/3/2006	One new source for " <i>Acroloxus</i> " that is not summarized. No new sources for " <i>Acroloxus coloradensis</i> , Rocky Mountain capshell, or capshell".
	Genetics Abstracts	8/3/2006	No mention for the search terms " <i>Acroloxus coloradensis</i> , " <i>Acroloxus</i> , Rocky Mountain capshell", and capshell".
	Web of Science	8/3/2006	No new sources for search term " <i>Acroloxus</i> , " <i>Acroloxus coloradensis</i> , Rocky Mountain capshell, and capshell".
	ASFA: Aquatic Sciences and Fisheries Abstracts (CSA subject subfiles)	8/3/2006	One old source for " <i>Acroloxus</i> " not summarized. No new sources for " <i>Acroloxus coloradensis</i> , Rocky Mountain capshell, and capshell".
	ProQuest Digital Dissertations	8/3/2006	No new sources for search term " <i>Acroloxus</i> , " <i>Acroloxus coloradensis</i> , Rocky Mountain capshell, and capshell".
	Networked Digital Library of Theses and Dissertations	8/1/2006	No new sources for search term " <i>Acroloxus</i> , " <i>Acroloxus coloradensis</i> , Rocky Mountain capshell, and capshell".?
Primary experts	Shi-Kuei Wu, University of Colorado, CU Museum Curator Emeritus	7/24/06	No Response
	Peter Hovingh Western U.S. malacologist/biologist	8/4/06	No new information

Source Category	Source/ Name	Date	Results
	Bonnie Ellis, University of Montana, Senior Research Scientist, Flathead Lake Biological Station	7/31/2006	No new information
NatureServe affiliate program databases and personnel	Gary Beauvais at WYNDD	8/9/2006	No new information
Federal Agency Personnel	Ward Hughson aquatic specialist Jasper National Park	8/11/2006	May have additional data on Jasper National Park population
Announcement from R2 to all FS personnel (including species list)	?	?	No announcement was made
Original Author	Tamara Anderson	7/24/2006	No new informatoin
State Agencies (e.g., WY Game and Fish, CDOW)	Tina Jackson, Colorado Division of Wildlife	7/31/2006	No new survey data to report

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