Chittenango ovate amber snail
(Novisuccinea chittenangoensis)

5-Year Review:
Summary and Evaluation

U.S. Fish and Wildlife Service
New York Field Office
Cortland, New York

September 2006

5-YEAR REVIEW

Species reviewed: Chittenango ovate amber snail *(Novisuccinea chittenangoensis)*
September 2006

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U.S. FISH AND WILDLIFE SERVICE
5-Year Review for Chittenango ovate amber snail (*Novisuccinea chittenangoensis*)
September 2006

1.0 GENERAL INFORMATION

1.1 Reviewers

Lead Regional Office: Region 5, Ms. Mary Parkin, (617) 876-6173, mary_parkin@fws.gov

Lead Field Office: New York Field Office, Ms. Robyn Niver, (607) 753-9334, robyn_niver@fws.gov

Cooperating Field Office: none

Cooperating Region: none

1.2 Methodology Used to Complete the Review:

This 5-year review was conducted as an individual effort by the lead endangered species biologist for the COAS. It summarizes information included in the recent recovery plan revision, as well as new threats and status information gathered in 2006 while the recovery plan was in the process of finalization. The recovery plan underwent public and peer review prior to approval.

1.3 Background

1.3.1 FR Notice announcing initiation of this review: 70 Federal Register 38976 (July 6, 2005): Initiation of a 5-Year Review of 5 Listed Species: The Virginia Northern Flying Squirrel (*Glaucomys sabrinus fuscus*), Delmarva Peninsula Fox Squirrel (*Sciurus niger cinereus*), Northeastern Bulrush (*Scirpus ancistrochaetus*), Chittenango Ovate Amber Snail (*Novisuccinea chittenangoensis*), and Virginia Round-Leaf Birch (*Betula uber*)

1.3.2 Listing history:

FR notice: 43 FR 28932
Date listed: July 3, 1978
Entity listed: species
Classification: threatened

1.3.3 Associated rulemakings: none

1.3.4 Review History: This review constitutes the first 5-year status review of the Chittenango ovate amber snail (COAS) since its listing. Information that has

become available since the 1978 rule have been used to evaluate and assess the current status of the COAS.

1.3.5 Species' Recovery Priority Number at start of review: 5

1.3.6 Recovery Plan:

Name of plan: Chittenango ovate amber snail (*Novisuccinea chittenangoensis*) Recovery Plan, First Revision
Date issued: July 11, 2006
Date(s) of previous plan/revision(s): March 1983

2.0 REVIEW ANALYSIS

2.1 Application of the 1996 Distinct Population Segment (DPS) policy

2.1.1 Is the species under review listed a vertebrate? No, the species is an invertebrate; therefore, the DPS policy is not applicable.

2.2 Recovery Criteria

2.2.1 Does the species have a final, approved recovery plan containing objective, measurable criteria? Yes

2.2.2 Adequacy of recovery criteria:

2.2.2.1 Do the recovery criteria reflect the best available and most up-to-date information on the biology of the species and its habitat? Yes

2.2.2.2 Are all relevant listing factors addressed in the recovery criteria? Yes

2.2.3 List the recovery criteria as they appear in the recovery plan, and discuss how each criterion has or has not been met, citing information.

Stabilization and Delisting Criteria:

In order to consider *Novisuccinea chittenangoensis* as **stabilized,** the following criteria should be met:

1. The population at Chittenango Falls is shown to be stable or improving for 10 years. To accomplish this, a baseline population size and distribution must be determined.

2. At least two healthy captive colonies of *Novisuccinea chittenangoensis* are successfully established in order to: (1) provide a source for augmenting the population at Chittenango Falls or introductions to new sites, (2) buffer against extinction in the wild, and (3) provide a source of *Novisuccinea chittenangoensis* for various scientific experiments related to their recovery. A healthy captive population is defined as having sufficient genetic diversity and being large enough to meet population goals, which will be specified in a new protocol based in part of the results of genetics research as well as results of research into the optimal conditions for propagation of *Novisuccinea chittenangoensis.*

3. The genetic distinctiveness of *Novisuccinea chittenangoensis* from other snails occupying the site is demonstrated. ***We have met this criterion through work by Dr. Tim King of the USGS.***

4. With respect to the five listing factors, threats to the species are abated as follows (noting that no risks to the snail were identified under Factor B or, for as long as the snail is listed, Factor D):

   Factor A. Protection of the snail's Chittenango Falls habitat by the NYSOPRHP is perpetuated.

   Factors C and E. A sufficient understanding of the relationship between *Novisuccinea chittenangoensis* and *Succinea* sp. B is gained and effective measures to reduce any negative interactions are in place. ***We are currently working on gaining the sufficient understanding.***

   Factor E. A sufficient understanding of any future threat of hybridization is gained to allow an effective response. ***We have met this criterion through work by Dr. Tim King of the USGS. There does not appear to be any threat of hybridization***

5. Monitoring of threats and effects of management practices indicate that recovery actions are contributing to the improved status of the species.

If and when the population is shown to be stable or increasing for at least five generations (10 years), recovery of *Novisuccinea chittenangoensis* can then focus on meeting conditions for delisting. **Delisting** will be considered when the following criteria (in addition to criteria 1-3) are met.

6. The *Novisuccinea chittenangoensis* population at Chittenango Falls must include at least 1000 snails with occupancy of both the lower and middle ledges. The population must be stable (or improving) for at least 10 years.

7. Threats to the snail are abated as follows:

Factor A. All sites with *Novisuccinea chittenangoensis* are permanently protected through acquisition, conservation easement, or another form of agreement.

Factor A. Written management/monitoring plans are in place for each site.

Factor A. A sufficient understanding of habitat and biological requirements is gained to conduct management efforts.

Factor D. *Novisuccinea chittenangoensis* is ensured continued protection by New York State after ESA protections are removed.

Factors C and E. Any negative interaction between *Novisuccinea chittenangoensis* and *Succinea* sp. B or other species is controlled with minimal management intervention.

Factor E. Searches for any other potential extant populations have been completed, and the extant population at Chittenango Falls has been successfully augmented.

Factor E. Searches for potential introduction sites have been completed, the potential for introduction has been thoroughly evaluated and, if warranted, one or more additional *Novisuccinea chittenangoensis* populations have been successfully established.

8. Monitoring of threats and effects of management practices indicate that recovery actions have led to a secure status for the species.

The only recovery criteria that have been met are those annotated in ***bold italics***.

2.3 Current Species Status and Updated Information

2.3.1 Biology and Habitat

2.3.1.1 New information on the species' biology and life history: All relevant information that has become available since the species' listing is summarized in the Chittenango Ovate Amber Snail Recovery Plan (Recovery Plan). Our current understanding of the snail's biology and habitat based on this information is summarized below.

2.3.1.2 Abundance, population trends, demographic features and/or trends: Overall, the population status is uncertain.

For background on survey work conducted before 2002, please see p. 11 of the Recovery Plan.

In 2002, the New York State Department of Environmental Conservation (NYSDEC), State University of New York College of Environmental Science and Forestry (ESF), and the U.S. Fish and Wildlife Service (USFWS) increased the survey effort and conducted a mark-release-recapture study at the Falls. Sixteen surveys were conducted during the study period between July and October 2002. The final population estimate using the Schumacher-Eschmeyer method was 183 individuals (95 percent C.I.: 145-222 individuals) (Arrigoni 2002). Arrigoni also estimated population size based on capture frequencies, with a final estimate of 206 individuals. Due to differences in survey intensity and questionable species identifications in years past, the validity and comparability of survey data over the 20-year period do *not* provide a sound basis for any accurate status statement. The protocol for the mark-release-recapture study was modified slightly and continued in 2003, 2004, and 2005 (Whiteleather 2003, 2004, 2005). The *Novisuccinea chittenangoensis* population was estimated to be 178 in 2003, 680 in 2004, and 819 in 2005. However, all work at the Falls was stopped in July 2006 due to a massive flood event which caused a rockslide in the primary COAS habitat. We are uncertain as to the effect of this event on the population as we have not been allowed back at the Falls to date due to the Park's safety concerns.

2.3.1.3 **Genetics, genetic variation, or trends in genetic variation:** While there are genetic concerns with any population this small, no trends in genetic variation have been detected.

2.3.1.4 **Taxonomic classification or changes in nomenclature:** Not applicable

2.3.1.5 **Spatial distribution, trends in spatial distribution, and/or historic range:** The only verified extant colony of *Novisuccinea chittenangoensis* is the type-population at Chittenango Falls, located in Chittenango Falls State Park, 3.6 miles north of Cazenovia, between the Towns of Cazenovia and Chittenango, Madison County, New York. At various times in the past, the species has been thought to have a broader range, but *Novisuccinea chittenangoensis* has not been confirmed at any other sites and the species is considered to be endemic to Chittenango Falls (Breisch 1987).

For more information, please see p. 10 of the Recovery Plan.

2.3.1.6 **Habitat or ecosystem conditions:** *Novisuccinea chittenangoensis* is found on a ledge beginning at 4 m from the eastern edge of the Falls and extending to approximately 16 m from the Falls. In addition, *Novisuccinea chittenangoensis* can be found on the middle ledge 4 m

above the primary ledge and in the talus as far as 3 m downslope from the primary ledge.

2.3.1.7 **Other:** Not applicable

2.3.2 Five-Factor Analysis (threats, conservation measures, and regulatory mechanisms)

2.3.2.1 **Factor A. The present or threatened destruction, modification, or curtailment of its habitat or range:** While destruction of *Novisuccinea chittenangoensis* habitat due to development is not an issue at Chittenango Falls State Park, habitat has been modified due to human disturbance. The 1978 final rule listing *Novisuccinea chittenangoensis* as threatened estimated that 60 percent of the habitat at Chittenango Falls was trampled by humans. Trampling of the snails and their habitat was identified early on as a major potential threat, and this threat was exacerbated in the early 1980s by flooding, which destroyed a bridge that would have tended to route visitors away from the snail population. Dislodging rocks, talus, or vegetation can cause serious harm to the snails and their eggs and can seriously harm their habitat.

The final rule also reported that pollution in the spray from Chittenango Creek may have caused the population decline, however, we have no information at this time to suggest that water quality is or is not impacting *Novisuccinea chittenangoensis*.

For more information, see p. 13 of the Recovery Plan.

2.3.2.2 **Factor B. Overutilization for commercial, recreational, scientific, or educational purposes:** Collection of *Novisuccinea chittenangoensis* has not been documented as a threat to the species.

2.3.2.3 **Factor C. Disease or predation:** The 1978 listing rule included predation by the introduced European snails, *Discus rotundatus* and *Oxychilus* spp. as serious threats to *Novisuccinea chittenangoensis*. Little is currently known about this relationship. Predation by small mammals, birds, salamanders, beetles, and other invertebrates is also a potential threat, albeit at a low level. There are no reports of disease or parasites threatening *Novisuccinea chittenangoensis*. However, investigation into potential parasites carried by *Succinea* sp. B and potentially transferred to *Novisuccinea chittenangoensis* should be undertaken.

2.3.2.4 **Factor D. Inadequacy of existing regulatory mechanisms:** This is not currently considered to be a direct threat to the species. For more information, please see p. 15 of the Recovery Plan.

2.3.2.5 Factor E. Other natural or manmade factors affecting its continued existence: Species with limited range and narrow ecological niches tend to be more vulnerable and stressed by change than are wider-ranging species. Periodic floods caused by spring thaws (such as occurred in 1980, 1993, and 1995) have resulted in much of the vegetation being washed away from the primary habitat ledge where most *Novisuccinea chittenangoensis* have been found in recent years. In addition to washing away vegetation, flood events also have the potential to dislodge rocks along the Falls. The ledges may break off, destroying the primary habitat and potentially the snails themselves. In late June 2006, a massive flood event resulted in a rockslide in the COAS' primary habitat at the Falls.

A particularly perplexing problem that was first recognized at the Falls in 1985 is the presence of an introduced snail, *Succinea* sp. B, that may be competing with *Novisuccinea chittenangoensis* for food and/or breeding or wintering habitat. *Succinea* sp. B is found throughout *Novisuccinea chittenangoensis*' habitat at Chittenango Falls, and further information is needed about the possible effects of this (*e.g.*, whether *Succinea* sp. B is suppressing the ability of the *Novisuccinea chittenangoensis* colony to sustain itself at viable levels). Investigations into the relationship between *Novisuccinea chittenangoensis* and *Succinea* sp. B were initiated in 2005 by ESF, the NYSDEC, and USFWS. These studies were curtailed in July 2006 after massive flooding at the Falls in June 2006. We hope to continue in 2007. In addition to the concerns about competition, there have been questions about whether *Novisuccinea chittenangoensis* and *Succinea* sp. B have the potential for hybridization, but recent analysis indicates that this is not a problem at this time

For more information, please see p. 15 of the Recovery Plan.

2.4 Synthesis

Based on the single population and existing threats, *Novisuccinea chittenangoensis* may be more accurately classified as an endangered rather than threatened species. In addition, given the rockslide event observed this past summer, the status of the species may be even more precarious than previously thought.

3.0 RESULTS

3.1 Recommended Classification: Uplist to endangered

Rationale: The species should be uplisted to endangered given its single known

location and current threats, as described above.

3.2 New Recovery Priority Number: 5

Rationale: The rarity and acute threats facing this snail and its habitat indicate a high threat level. The current lack of management options for abating the threats of overcompetition by invasive species and natural disturbances such as flooding, as well as past lack of success in efforts to propagate the species to overcome small population effects, indicate a low potential for recovery. The species does occur within a protected area, thus precluding economic conflicts. In accordance with Table 3 in 48 FR 184: 43104, a priority number of 5 is based on high threat, low recovery potential, taxonomic standing as a species, and no economic conflicts.

3.3 Listing and Reclassification Priority Number: 2

Rationale: Based on Table 1 in 48 FR 184: 43103, the magnitude of the threats facing the COAS is rangewide and severe, and the threats are documented and imminent, lead to a priority number of 2.

4.0 RECOMMENDATIONS FOR FUTURE ACTIONS

- The Service should continue to implement the Recovery Plan. A captive propagation protocol should be established as soon as possible and captive rearing should begin once a protocol is in place. Baseline surveys will need to be redone at the Falls given the flood event in 2006. Research into the interactions between COAS and Sp. B should be reinitiated in 2007.

- A proposal to uplist the COAS to endangered should be prepared.

5.0 REFERENCES

Data and literature are located within the U.S. Fish and Wildlife Service's New York Field Office, 3817 Luker Road, Cortland, New York 13045.

Arrigoni, J.E., Jr. 2002. Mark-release-recapture study of the Chittenango ovate amber snail(*Novisuccinea chittenangoensis* Pilsbry), July-October, 2002. Final Report to New York State Department of Environmental Conservation Endangered Species Unit.

Breisch, A.R. 1987. 1986-87 Endangered Species Report- Project Number E-1-10, Job Number VIII-13. New York State Department of Environmental Conservation.

U.S. Fish and Wildlife Service. 2006. Chittenango Ovate Amber Snail *(Novisuccinea chittenangoensis)* Recovery Plan, First Revision. Hadley, Massachusetts. xiii + 55 pp.

Whiteleather, K. 2003. Mark-release-recapture study of the Chittenango ovate amber snail (*Novisuccinea chittenangoensis* Pilsbry), June-October 2003. Final Report to the New York State Department of Environmental Conservation Endangered Species Unit.

_____, 2004. Mark-release-recapture study of the Chittenango ovate amber snail (*Novisuccinea chittenangoensis* Pilsbry), June-October 2004. Final Report to the New York State Department of Environmental Conservation Endangered Species Unit.

_____, 2005. Mark-release-recapture study of the Chittenango ovate amber snail (*Novisuccinea chittenangoensis* Pilsbry), May-September 2005. Final Report to the New York State Department of Environmental Conservation Endangered Species Unit.

U.S. FISH AND WILDLIFE SERVICE
5-YEAR REVIEW of Chittenango ovate amber snail (*Novisuccinea chittenangoensis*)

Current classification: Threatened

Recommendation resulting from the 5-Year Review:

____ Downlist to Threatened
_x_ Uplist to Endangered
____ Delist
____ No change is needed

Appropriate Listing/Reclassification Priority Number, if applicable: 2

Review conducted by: Robyn Niver, New York Field Office

FIELD OFFICE APPROVAL:

Lead Field Supervisor, Fish and Wildlife Service

Approve _____ Date 9/28/06

REGIONAL OFFICE APPROVAL:

Lead Regional Director, Region 5, Fish and Wildlife Service

Approve _____ Acting Date 10/7/06