

Ring Pink
***Obovaria retusa* (Lamarck, 1819)**

5-Year Review:
Summary and Evaluation



(USFWS photo)

U.S. Fish and Wildlife Service
Southeast Region
Kentucky Ecological Services Field Office
Frankfort, Kentucky

5-YEAR REVIEW
Ring pink (*Obovaria retusa*)

I. GENERAL INFORMATION

A. Methodology used to complete the review

Public notice was provided in the *Federal Register* on July 28, 2006 (71 FR 42871), and a 60-day comment period was opened. During this comment period, we obtained information on the status of this species from several species' experts, and additional data was obtained from the recovery plan, peer-reviewed scientific literature, and our state partners. Once all known literature and information was collected for this species, Leroy Koch, Fish and Wildlife biologist with the Kentucky Ecological Services Field Office, completed the review. The draft document was also peer-reviewed by Steve Ahlstedt, retired USGS biologist, Norris, Tennessee, Dr. Monte McGregor, Kentucky Department of Fish and Wildlife Resources, Frankfort, Kentucky, and Ryan Evans, Kentucky State Nature Preserves Commission. Comments received were mostly editorial in nature and evaluated and incorporated as appropriate (see Appendix A).

B. Reviewers

Lead Region --Kelly Bibb, Southeast Region, Atlanta, GA, 404-679-7132

Lead Field Office -- Kentucky Ecological Services Field Office, Frankfort, KY: Leroy Koch, 502-695-0468

Cooperating Region – Carlita Payne, Midwest Region, Bloomington, MN, 612-713-5339

Mary Parkin, Northeast Region, Hadley, MA, 617-417-3331

Cooperating Field Office(s) --

Geoff Call, Tennessee Ecological Services Field Office, Cookeville, TN, 931-528-6481

Jeff Powell, Alabama Ecological Services Field Office, Daphne, AL, 251-441-5181

Angela Boyer, Columbus, Ohio Ecological Services Field Office, Columbus, OH, 612-416-8993

Jody Millar, Rock Island Ecological Services Field Office, Rock Island, IL, 309-757-5800

Lori Pruitt, Bloomington Ecological Services Field Office, Bloomington, IN, 812-334-4261

C. Background

1. Federal Register Notice citation announcing initiation of this review:

July 28, 2006; 71 FR 42871.

2. Species status: 2010 Recovery Data Call; Declining

Species continues to be extremely rare and no individuals were observed over the past year. Over the past 10 years, the only live individuals (total of 3) have been observed in the Green River (Kentucky). The most significant threats identified in the recovery plan (conversion of free-flowing rivers to impoundments; decreased availability of fish host(s); sedimentation of habitat from channel dredging and gravel mining) continue to impact the species and no viable populations of the species are believed to exist. Intensive survey efforts by KDFWR and Campbellsville University (Dr. Richie Kessler) on the Green River (Green and Hart Cos, KY) in FY10 did not locate individuals of *O. retusa*. The fish host remains unknown.

3. Recovery achieved: 1 (1 = 0% to 25% of recovery objectives achieved).

4. Listing history

Original Listing

FR notice: 54 FR 40109

Date listed: September 29, 1989

Entity listed: species

Classification: endangered

5. Associated rulemakings

Establishment of Nonessential Experimental Population Status for 15 Freshwater Mussels, 1 Freshwater Snail, and 5 Fishes in the Lower French Broad River and in the Lower Holston River, Tennessee, Final Rule; September 13, 2007; 72 FR 52434

6. Review History:

Recovery Plan for Ring Pink Mussel (*Obovaria retusa*), March 1991

Recovery Data Call, 2010-1998, U. S. Fish and Wildlife Service, Kentucky Ecological Services Field Office.

A previous 5-year review for this species was noticed on November 6, 1991 (56 FR 56882). In that review, the status of many species was simultaneously evaluated with no in-depth assessment of the five factors as they pertained to the individual species. In particular, no changes were proposed for the status of the ring pink in that review.

7. **Species' Recovery Priority Number at start of review (48 FR 43098):**
5, Degree of threat is considered to be high, recovery potential is estimated as low, and taxonomic level is species.

8. **Recovery Plan**

Name of plan: Recovery Plan for Ring Pink Mussel (*Obovaria retusa*)

Date issued: March 25, 1991

II. REVIEW ANALYSIS

A. Application of the 1996 Distinct Population Segment (DPS) policy

The Act defines species as including any subspecies of fish or wildlife or plants, and any distinct population segment of any species of vertebrate wildlife. This definition limits listing DPSs to only vertebrate species of fish and wildlife. Because the species under review is an invertebrate, the DPS policy is not applicable.

B. Recovery Criteria

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

2. **Adequacy of recovery criteria.**

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

b. **Are all of the 5 listing factors that are relevant to the species addressed in the recovery criteria (and is there no new information to consider regarding existing or new threats)?** Yes

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.**

Downlisting Criteria

Ring pink will be considered for downlisting or reclassification from endangered to threatened status upon completion of the following (USFWS 1991):

1. Through protection of existing populations and successful establishment of reintroduced populations or discovery of additional populations, a total of at least six Ohio River system tributaries contain viable populations. These populations will be

distributed within the Ohio River system as follows: two populations in the upper Ohio River basin in Pennsylvania, Ohio, West Virginia, Indiana, or Illinois; two populations in Kentucky; and two populations in Tennessee.

2. Biological and ecological studies have been completed, and the recovery measures developed and implemented from these studies are beginning to be successful, as evidenced by an increase in population density and/or an increase in the population size and length of the river reach inhabited within each of the populations.

Delisting Criteria

Ring pink will be considered for delisting upon completion of the following (USFWS 1991):

1. Through protection of existing populations and successful establishment of reintroduced populations or discovery of additional populations, a total of at least nine Ohio River system tributaries contain viable populations. These populations will be distributed within the Ohio River system as follows: one population in Pennsylvania, one population in Ohio, one population in West Virginia, one population in Indiana, one population in Illinois, two populations in Kentucky (one in the lower Tennessee or Cumberland River and one in another Ohio River tributary such as the Green River), and two populations in the Tennessee River.

2. Studies of the mussel's biological and ecological requirements have been completed, and the recovery measures developed and implemented from these studies have been successful, as evidenced by an increase in population density and/or an increase in the population size and length of the river reach inhabited within each of the nine populations.

3. No foreseeable threats exist that would likely threaten survival of any of these nine populations.

4. Where habitat had been degraded, noticeable improvements in water and substratum quality have occurred.

Disease or predation is not relevant to the species and was not addressed by recovery criteria included in the Recovery Plan. We have no new information on this listing factor to indicate this has changed; therefore, we do not include further discussion on this factor in this five-year review.

Historically, the ring pink mussel was widespread in mid-size to large rivers in the Ohio River basin. It is now one of the rarest mussels in North America and is on the brink of extinction. Collections and observations during the last 30 years have yielded only about 18 records of the ring pink from the Tennessee, Cumberland, and Green Rivers.

At the time the recovery plan was completed in 1991, it was believed that five populations remained; however, even these populations were considered to be relic and

possibly non-reproducing (USFWS 1991). These populations were located within four river basins: the Green River in Kentucky, the Kanawha River in West Virginia, and the Tennessee and Cumberland rivers in Kentucky and Tennessee. The record from the Kanawha River in West Virginia has since been confirmed as a misidentification (William Tolin, October 24, 1991 memorandum), and the species is now considered to be extirpated from West Virginia.

In general, populations that currently exist are known primarily from serendipitous records. It is believed that the species has been extirpated from all five river reaches. Extremely small populations may still occur in small segments of the Tennessee River downstream of Wilson Dam, Pickwick Landing Dam, and/or perhaps Kentucky Dam; the Cumberland River near Hartsville, Tennessee; and a small segment of the Green River in Kentucky.

Most observed individuals have been old, and there is no evidence this species is offsetting mortality rates through reproduction and recruitment. Encountering specimens in the wild is becoming an increasingly rare occurrence, even though mussel surveys are more commonplace, thorough, and intensive. The ring pink has not been recorded from the Tennessee River since the early 1990s, and the species may already be functionally extinct in the wild. Only three individuals have been recorded from the Green River since 1998. One of these individuals, a female held at the Minor Clark Fish Hatchery (not a mussel propagation facility) since its capture, died in 2004. When captured, this female contained unfertilized eggs at a time when the eggs should have been fertile, indicating that this species is so rare that successful reproduction in the wild is problematic. Two old males were collected in 2005 but have since died in captivity at the CMC facility.

Two of these individuals were serendipitous finds while the third was a result of intense search efforts lead by Dr. Monte McGregor in 2004 and 2005. We believe the species still exists in the Green River, but in extremely low numbers that hamper survey efforts to locate additional individuals. However, we believe it may be reproducing and possibly recruiting in the Green River. The Service provided funding to Dr. Monte McGregor of the Kentucky Department of Fish and Wildlife Resources in 2005 to search for ring pink mussels in the Green River. The most recent or 'new' record from the Tennessee River downstream of Wilson Dam (in Tennessee) was taken in the early 1990s as part of a commercial mussel harvest (Terry Richardson, personal communication, University of North Alabama, 2005). Ring pink records from the Tennessee River downstream of Pickwick Landing Dam, downstream of Kentucky Dam, and the Cumberland River are from the 1980s or earlier (Leroy Koch, personal communication, USFWS, 2007; Don Hubbs, personal communication, Tennessee Wildlife Resources Agency, 2007). We believe this species persists in these rivers; however, ring pink mussels are so rare that we lack the ability to detect them through typical mussel surveys. At present, we believe that no viable populations of the species persist within its historic range.

Studies of the mussel's biological and ecological requirements have not been completed. Recovery actions such as fish host identification, propagation of juvenile mussels,

reintroduction of propagated individuals to selected rivers, etc., can only occur if enough adult ring pink mussels are located. Two males and one female captured from the Green River since 1998 were brought into captivity, but all these specimens later perished. There was no opportunity to determine fish hosts for this species (Dr. Monte McGregor, personal communication, KDFWR, 2007). The fish host for this species is currently unknown.

Threats for the species remain very similar to those present when the recovery plan was developed. Current threats to the ring pink primarily result from its restricted range, small population numbers, and its apparent inability or limited ability to recruit individuals into the population. In addition, the conversion of sections of large rivers from free-flowing systems to a series of long, linear impoundments has seriously reduced the availability of its preferred riverine gravel and sand habitat and likely affected the distribution and availability of the ring pink mussel's fish host. The recovery plan mentioned threats by oil and gas production in the Green River drainage. Dr. Richie Kessler (personal communication, The Nature Conservancy, 2007), indicated that the oil and gas threats mentioned in the recovery plan likely refer to past activity (e.g., 1960s), and that oil and gas production are no longer considered a major threat. Unfortunately, recent interest in gas exploration has resulted in new activity, especially in Green, Metcalf, and Hart counties in the Green River drainage, and may represent an increasing threat in the future. Gravel dredging, channel maintenance, and commercial mussel fishing in the Tennessee and Cumberland Rivers were also listed in the recovery plan as threats. Although this species is not commercially valuable, incidental take of the species could sometimes occur during commercial mussel fishing for other species. However, it is likely that the commercial take has become less of a threat to this species over the last 20 years or so because fewer commercial mussel fishermen are using brailing methods to harvest mussels. Brailing is indiscriminate with regard to the species harvested. Most recent commercial mussel harvests employ diving and collecting of mussels by hand, allowing the commercial mussel fisherman to select only species commercially valuable.

Knowledge of habitat improvements, if any, are either considered negligible and/or have not been studied well enough to document improvements and/or diminishment of original habitat degradation.

C. Updated Information and Current Species Status

1. Biology and Habitat:

a. Abundance, population trends (e.g. increasing, decreasing, stable), demographic features (e.g., age structure, sex ratio, family size, birth rate, age at mortality, mortality rate, etc.), or demographic trends:

At the time the recovery plan was completed in 1991, it was believed that five populations remained; however, even these populations were considered to be relic and possibly non-reproducing (USFWS 1991). These populations were

located within four river basins: the Green River in Kentucky, the Kanawha River in West Virginia, and the Tennessee and Cumberland rivers in Kentucky and Tennessee. The record from the Kanawha River in West Virginia has since been confirmed as a misidentification (William Tolin, October 24, 1991 memorandum), and the species is now considered to be extirpated from West Virginia.

The species' historic range included the states of Alabama, Illinois, Indiana, Kentucky, Ohio, Pennsylvania, Tennessee, and West Virginia. Only 3 specimens of this mussel have been found in the last 15 years and if a viable population still exists, we believe it occurs in the Green River.

Portions of the Green River that historically had ring pink have been sampled in several different years by the State of Kentucky without further evidence of this species' occurrence. There have been other partial survey efforts in portions of the Green River further downstream of Mammoth Spring Park but ring pinks have not been observed.

Based on the size of the lower Ohio River, the sheer extent of potential habitat, and the difficulty in adequately sampling large river habitats (e.g., due to depth, sampling conditions, equipment logistics), even if the species were extant, the chances of finding an individual is extremely low. However, if live individuals are found, there are several mussel culture facilities within its range that could attempt to hold and/or propagate this species.

b. Genetics, genetic variation, or trends in genetic variation:

No information is currently known concerning population genetics.

c. Taxonomic classification or changes in nomenclature:

There has been no change in the classification or nomenclature of this species.

d. Spatial distribution, trends in spatial distribution, or historic range (e.g. corrections to the historical range, change in distribution of the species' within its historic range, etc.):

No live specimens or fresh dead shells have been found in most areas for those species, except 3 individuals in the Green River system.

e. Habitat or ecosystem conditions (e.g., amount, distribution, and suitability of the habitat or ecosystem):

This is a large river species. Very little occupied large river habitat remains anywhere within its historical range.

2. Five-Factor Analysis

a. Present or threatened destruction, modification or curtailment of its habitat or range:

No new information is available since the recovery plan was finalized.

b. Overutilization for commercial, recreational, scientific, or educational purposes:

Overutilization for commercial, recreational, scientific or educational purposes was not considered to be a limiting factor in the Recovery Plan. We have no new information to indicate that this has changed.

c. Disease or predation:

We have no new information on disease or predation that would indicate either is a limiting factor.

d. Inadequacy of existing regulatory mechanisms:

We have no new information regarding inadequacy of existing regulatory mechanisms for protecting this species.

e. Other natural or manmade factors affecting its continued existence:

We have no new information on any other natural or manmade factors.

D. Synthesis -

No viable populations are considered to be extant for ring pink. At the time the recovery plan was completed in 1991, five populations were thought to still remain; however, even these populations were considered to be relic and possibly non-reproducing. Threats to the remaining populations identified in the recovery plan included water quality problems due to oil and gas production, gravel dredging, channel maintenance, commercial mussel fishing, and reduced natural reproduction. The record from the Kanawha River in West Virginia has since been determined to be a misidentification (William Tolin, October 24, 1991 memorandum), therefore this species is considered as extirpated from West Virginia. The most recent 'new' record from the Tennessee River downstream of Wilson Dam is from the early 1990s (Terry Richardson, personal communication, University of North Alabama, 2005) from activities related to a commercial mussel harvest. It is believed that the species has been extirpated from all but the following five river reaches: the Green River in Kentucky, the Tennessee River downstream of Wilson Dam in Alabama, the Tennessee River downstream of Pickwick Landing Dam in Tennessee, portions of the Cumberland River, and the Tennessee River downstream of Kentucky Dam in Kentucky. The most recent records are from the Green River, where three live adults have been found since 1998. We believe the species still exists in the Green River, but in extremely low numbers that hamper survey efforts and undermine our ability to locate individuals. Ring pink records from the Tennessee River downstream of Pickwick Landing Dam, downstream of Kentucky Dam, and the Cumberland River are from the

1980s or earlier (Leroy Koch, personal communication, USFWS, 2007; Don Hubbs, personal communication, Tennessee Wildlife Resources Agency, 2007). We still believe this species occurs in the Green River and may occur in many of these rivers, but we are hampered by the lack the ability to detect this species through typical mussel surveys.

The fish host for this species remains a mystery. Ring pink mussels from the wild are not easily obtained for research designed to determine fish hosts. Mussels that have been located and brought into captivity have not survived long enough to bring male and females together to effect reproduction.

Threats for the species remain very similar to those present when the recovery plan was developed. Current threats to the ring pink primarily result from its restricted range, small population numbers, and its apparent inability or limited ability to recruit individuals into the population. In addition, the conversion of sections of large rivers from free-flowing systems to a series of long, linear impoundments has seriously reduced the availability of its preferred riverine gravel and sand habitat and likely affected the distribution and availability of the ring pink mussel's fish host. The recovery plan mentioned threats by oil and gas production in the Green River drainage. Dr. Richie Kessler (personal communication, The Nature Conservancy, 2007), indicated that the oil and gas threats mentioned in the recovery plan likely refer to past activity (e.g., 1960s), and that oil and gas production are no longer considered a major threat. Unfortunately, recent interest in gas exploration has resulted in new activity, especially in Green, Metcalf, and Hart counties in the Green River drainage, and may represent an increasing threat in the future. Gravel dredging, channel maintenance, and commercial mussel fishing in the Tennessee and Cumberland Rivers were also listed in the recovery plan as threats. Although this species is not commercially valuable, incidental take of the species could sometimes occur during commercial mussel fishing for other species. However, it is likely that the commercial take has become less of a threat to this species over the last 20 years or so because fewer commercial mussel fishermen are using brailing methods to harvest mussels. Brailing is indiscriminate with regard to the species harvested. Most recent commercial mussel harvests employ diving and collecting of mussels by hand, allowing the commercial mussel fisherman to select only species commercially valuable.

Knowledge of habitat improvements, if any, are either considered negligible and/or have not been studied well enough to document improvements and/or diminishment of original habitat degradation. Therefore, based on available information presented herein we believe that the ring pink should remain an endangered species.

III. RESULTS

A. Recommended Classification:

 X No change is needed

IV. RECOMMENDATIONS FOR FUTURE ACTIONS

1. Conduct a thorough survey of the Green River in suitable habitat, from the Green River Dam in Green Co., Kentucky downstream to Lock and Dam 4 in Butler Co., Kentucky. Individuals found should be pit tagged and located in suitable habitat for this species in the Green River where they can be accessed for life history study and propagation efforts.
2. Determine the fish host(s) of the ring pink and propagate using the fish host and/or in-vitro methods. Any propagated juveniles should be located in the best suitable habitat in the Green River and/or Licking River in Kentucky.
3. Begin studies in the cryopreservation of gametes and glochidia of a surrogate mussel in anticipation of using this technique on the ring pink. This work, if successful, will preserve gametes and glochidia for propagation. This is needed because of the difficulty in being able to bring male and female ring pink mussels together for reproduction.
4. Search for the ring pink in the Tennessee and Cumberland Rivers at sites with suitable habitat and mussel assemblages indicating the possible presence of ring pink mussels.
5. Encourage commercial mussel fishermen to help find a ring pink alive and make it available to the Service. Included in this effort should be an education effort and a possible 'reward' to those commercial fisherman participating in the successful location of any live ring pink mussels.
6. Update the recovery plan as new information is obtained and with regard to the status of the mussel.

V. REFERENCES

- Tolin, William. 1991. U.S. Fish and Wildlife Service e-mail documenting the mis-identification of the ring pink mussel in the Kanawha River in West Virginia.
- USFWS. 1991. Recovery Plan for Ring Pink Mussel (*Obovaria retusa*). Atlanta, Georgia. 24 pp.

Experts consulted include the following:

Dr. Terry Richardson, 2005. University of North Alabama in Florence, Alabama. Provided information on ring pink found with mussel fisherman downstream of Wilson Dam in Lauderdale Co., Alabama.

Don Hubbs, 2007. Tennessee Wildlife Resources Agency, mussel biologist for the state of Tennessee. Mr. Hubbs works closely with commercial mussel fisherman and monitors the commercial harvest of mussels in Tennessee.

Dr. Richie Kessler, 2007. The Nature Conservancy in Kentucky. Dr. Kessler is a biologist with the TNC who works primarily on the Green River in Kentucky.

Dr. Monte McGregor, 2007. Kentucky Dept. of Fish and Wildlife Resources. Dr. McGregor operates a mussel propagation facility in Frankfort, Kentucky and has extensive experience sampling mussels in the field.

Ryan Evans, 2007. Kentucky State Nature Preserves Commission, Aquatic Biologist with experience working with mollusks.

Leroy Koch, 2007. (author of this review) U.S. Fish and Wildlife Service biologist. Experience working with commercial mussel fishermen in Alabama and Tennessee, especially regarding federally listed mussel species in the commercial harvest.

**U.S. FISH AND WILDLIFE SERVICE
5-YEAR REVIEW of Ring pink (*Obovaria retusa*)**

Current Classification Endangered

Recommendation resulting from the 5-Year Review

X No change is needed

Review Conducted By: Leroy Koch, Kentucky Ecological Services Field Office

FIELD OFFICE APPROVAL:

Lead Field Supervisor, Fish and Wildlife Service

Approve *Vangel Lee Anderson* Date 4/27/11

REGIONAL OFFICE APPROVAL:

The Regional Director or the Assistant Regional Director, if authority has been delegated to the Assistant Regional Director, must sign all 5-year reviews

Lead Regional Director, Fish and Wildlife Service

Approve *Paul M. Grier* Date 5/31/11

Cooperating Regional Director, Fish and Wildlife Service

Concur Do Not Concur

Signature *[Signature]* Date 8/18/11

Acting Regional Director

Cooperating Assistant Regional Director, Fish and Wildlife Service, Midwest Region

Concur Do Not Concur

Signature *Lynn M. Deus* Date 7/1/11

APPENDIX A: Summary of peer review for the 5-year review of ring pink (*Obovaria retusa*)

A. Peer Review Method:

Three individuals identified above in the References section that have decades of experience with mussel surveys and research and are well acquainted with the genus and the habitat of its species were selected as peer reviewers - Steve Ahlstedt, retired USGS biologist, Norris, Tennessee, Dr. Monte McGregor, Kentucky Department of Fish and Wildlife Resources, Frankfort, Kentucky, and Ryan Evans, Kentucky State Nature Preserves Commission. A memorandum was sent via email to the peer reviewers soliciting their comments on a draft of this 5-year review. Comments from all individuals were received.

B. Peer Review Charge:

Peer reviewers were asked to evaluate the 5-year review and provide any comments, edits or suggestions on the data and information in this document. Peer reviewers were not asked to comment on the status recommendation.

C. Summary of Peer Review Comments/Report –

Peer reviews were mainly editorial in nature with a only a few minor comments to the content.

D. Response to Peer Review –

All comments and suggested edits were carefully considered and incorporated where deemed appropriate in the final draft of the 5 year review. Comments were generally in agreement with our assessment on population status and other information contained in the document. No major concerns were raised.