

Upland Combshell (*Epioblasma metastriata*)
Southern Acornshell (*Epioblasma othcaloogensis*)

5-Year Review:
Summary and Evaluation

U.S. Fish and Wildlife Service
Southeast Region
Alabama Ecological Services Field Office
Daphne, Alabama

5-YEAR REVIEW
Upland Combshell (*Epioblasma metastriata*)
Southern Acornshell (*Epioblasma othcaloogensis*)

I. GENERAL INFORMATION

A. Methodology used to complete the review:

This review was completed by the lead recovery biologist in the Alabama Ecological Services (ES) Field Office, Daphne, Alabama. The primary sources of information used in this analysis were the 1993 final listing rule (58 FR 14330), 2004 critical habitat designation (69 FR 40084), Mobile River Basin Aquatic Ecosystem recovery plan (USFWS 2000), the previous 5-Year Review (USFWS 2008), peer-reviewed reports, agency reports, unpublished survey data and reports, and personal communication with recognized experts. All literature and documents used for this review are on file at the Alabama ES Field Office. All recommendations resulting from this review are the result of thoroughly reviewing the best available information on the upland combshell and southern acornshell. Comments and suggestions regarding this review were received from peer reviewers from outside the U.S. Fish and Wildlife Service (Service). See Appendix A for a summary of peer reviewer comments. No part of the review was contracted to an outside party. In addition, this review was announced to the public on September 23, 2014 (79 FR 56821), with a 60-day comment period. No comments were received during this period.

B. Reviewers

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

Lead Field Office: Alabama Ecological Services Field Office, Daphne, AL:
Anthony Ford (251) 441-5838

Cooperating Field Offices:

Mississippi ES Field Office, Jackson, MS: Paul Hartfield (601) 321-1125
Georgia ES Field Office, Athens, GA: Robin Goodloe (706) 613-9493 Ext. 221
Tennessee ES Field Office, Cookeville, TN: Stephanie Chance (931) 528-6481

C. Background

- 1. Federal Register Notice citation announcing initiation of this review:**
79 FR 56821, September 23, 2014.
- 2. Species status:**
Upland combshell - Presumed extinct
Southern acornshell - Presumed extinct

3. **Recovery achieved:**
 “1” for both mussels; 1=0-25% recovery objectives achieved

4. **Listing history:**

Original Listing
 FR notice: 58 FR 14330
 Date listed: March 17, 1993
 Entity listed (species, subspecies, DPS): both listed as species
 Classification (threatened or endangered):
 upland combshell (endangered)
 southern acornshell (endangered)

5. **Associated actions:**
 Designation of Critical Habitat for Three Threatened Mussels and Eight Endangered Mussels in the Mobile River Basin: 1 July 2004: 69 FR 40083.

6. **Review history**
 The Service’s last 5-year review for the upland combshell and southern acornshell was conducted in 2008 where the final recommendation was to delist due to extinction (Service 2008). The last known records for the upland combshell were from the Conasauga River, Georgia in 1986; and for the southern combshell from the Conasauga River, Georgia and Little Canoe Creek, Alabama in 1973 (Williams *et al.* 2008, Shelton-Nix 2017).

 During the third Alabama Nongame Wildlife Conference (2012), members of the mussel committee, suggested both the upland combshell and southern acornshell should be considered extinct because they are no longer found within their historic range (Shelton-Nix 2017). This recommendation was a downgraded designation from the 2002 mussel committee position where both the upland combshell and southern acornshell were recognized as only extirpated in Alabama (Mirarchi 2004).

7. **Species’ recovery priority number at start of review (48 FR 43098):**
 upland combshell – 5
 southern acornshell – 5
 (5 indicates that the degree of threat is high; potential for recovery is low; taxonomy is species level)

8. **Recovery plan**
 Name of plan: Mobile River Basin Aquatic Ecosystem Recovery Plan

II. REVIEW ANALYSIS

A. **Application of the 1996 distinct population segment (DPS) policy**

The Act defines species as including any subspecies of fish, wildlife, or plant, 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 are invertebrates, the DPS policy is not applicable and will not be addressed further in this review.

B. **Recovery Criteria**

1. **Do these species have final, approved recovery plans containing objective, measurable criteria? No**

2. **Adequacy of recovery criteria.**

These species have a final, approved recovery plan; however, recovery criteria were not specified for either of the two mussels because of the extent of their decline, habitat loss and fragmentation, population isolation, and continuing impacts on their habitats at the time of listing (USFWS 2000). Protecting surviving populations of the mussels along with their river and stream habitats is the primary recovery objective. This can be measured by the continued persistence of the mussel populations over time, and the discovery of previously unknown populations. Another obstacle to recovery and developing recovery criteria was a lack of information on habitat and life history needs, host fish, and management options. Increasing this information and developing management technology is a benchmark for measuring progress toward recovery and developing objective, measurable criteria; however, the ability to locate credible locations that may have these mussels has not proved successful.

C. **Updated Information and Current Species Status**

1. **Biology and Habitat**

Information on biology and habitat of the upland combshell (Figure 1) and southern acornshell (Figure 2), was updated in the Proposed Designation of Critical Habitat for Three Threatened Mussels and Eight Endangered Mussels in the Mobile River Basin

(68 FR 14752). No new information on biology and habitat is available at this time.

Upland Combshell (Figure 1)

Distribution/Abundance

The historical range of the upland combshell included portions of the Black Warrior, Cahaba, and Coosa Rivers of the Mobile River Basin and some of their tributaries in Alabama, Georgia, and Tennessee. The last known collection of the upland combshell was 1986 from the Conasauga River, Georgia (Shelton-Nix 2017). When listed, the species was believed to be restricted to the Conasauga River in Georgia, and possibly portions of the upper Black Warrior and Cahaba River drainages. Surveys of Coosa River tributaries have since been conducted by Service biologists, as well as Bogan and Pierson (1993a), Dinkins (2008), Dinkins and Hughes (2011), Evans (2001), Gangloff (2003, 2005), Golder Associates 2008, Johnson (2006), Johnson and Evans (2000), Johnson *et al.* 2005, Pierson (1993), Krause *et al.* (2012), McGregor and Garner (2004), Moran (2011 and 2017), Williams and Hughes (1998), and others. Surveys of the Cahaba River have been conducted by Service biologists, Bogan and Pierson (1993b), Freeman 2011, McGregor *et al.* (2000), McGregor and Garner (2004), Shepard *et al.* (1994), Johnson *et al.* (2006), and others. Surveys in the upper Black Warrior drainage have been done by Service biologists, Sheppard *et al.* (1998), Warren and Haag (1994), Haag and Warren (2003), Garner *et al.* (2014), McGregor and Wynn (2008), McGregor *et al.* (2013), and others. All surveys have failed to locate any evidence of the persistence of the upland combshell, and some authors believe the species to be extinct (Evans 2001, Gangloff 2003, Gangloff and Feminella (2007), Williams *et al.* (2008), and Shelton-Nix (2017).

Southern acornshell (Figure 2)

Distribution/Abundance

Historically, the southern acornshell occurred in the upper Coosa River system and upstream of the fall line on the Cahaba River in Alabama, Georgia, and Tennessee. The southern acornshell was last collected in 1973 from the Conasauga River in Georgia and from Little Canoe Creek, near the Etowah and St. Clair county line, Alabama (Williams *et al.* 2008, Shelton-Nix 2017); and has not been collected from the Cahaba River since the 1930s (58 FR 14330). It was the Service's determination at the time of listing,

with consensus of the malacological community that this species was likely to persist in low numbers in the upper Coosa River drainage, and possibly in the Cahaba River. Since that time, multiple surveys in the Coosa River tributaries have been conducted by Service biologists, as well as Bogan and Pierson (1993a), Dinkins (2008), Dinkins and Hughes (2011), Fobian *et al.* 2017, Gangloff (2003, 2005), Golder Associates 2008, Johnson (2006), Johnson and Evans (2000), Johnson *et al.* 2005, Johnson *et al.* (2006), Pierson (1993), McGregor and Garner (2004), Williams and Hughes (1998), Krause *et al.* (2012), and all have failed to report the southern combshell. Surveys of the Cahaba River have been conducted by Service biologists, Bogan and Pierson (1993b), Freeman 2011, McGregor *et al.* (2000), McGregor and Garner (2004), Shepard *et al.* (1994, 1998), Gangloff (2006), and others. Despite these repeated surveys of historical habitat in the Coosa and Cahaba River drainages, no living animals or fresh or weathered shells of this species have been located. Recent authors have presumed the species to be extinct (Evans 2001, Gangloff 2003, Gangloff and Feminella (2007), Williams *et al.* (2008), and Shelton-Nix (2017).

2. **Five factor analysis (threats, conservation measures, and regulatory mechanisms)**
 - a. **Present or threatened destruction, modification, or curtailment of habitat or range:**

No new information is available due to failure to find populations or live individuals.
 - b. **Overutilization for commercial, recreational, scientific, or educational purposes:**

No new information is available.
 - c. **Disease or predation:**

No new information is available.
 - d. **Inadequacy of existing regulatory mechanisms:**

No new information is available.
 - e. **Other natural or manmade factors affecting the species' continued existence:**

No new information is available.

D. Synthesis:

Upland combshell: Multiple surveys since listing have failed to locate any live specimens; therefore, the species is presumed extinct.

Southern acornshell: Multiple surveys since listing have failed to locate any live specimens; therefore, the species is presumed extinct.

When listed, the upland combshell was believed to be restricted to the Conasauga River in Georgia, and possibly, portions of the upper Black Warrior and Cahaba River drainages. It was thought that the southern acornshell was likely to persist in low numbers in the upper Coosa River drainage, and possibly, in the Cahaba River. Numerous mussel surveys have been completed within these areas, as well as other areas within the historical ranges of these species since the listing of these mussels with no success. Although other federally listed mussels have been found by mussel experts during these surveys, no live or fresh-dead specimens of upland combshell or southern acornshell have been found.

III. RESULTS

A. Recommended Classification:

- Downlist to Threatened
- Uplist to Endangered
- Delist (*Indicate reasons for delisting per 50 CFR 424.11*):
 - Extinction
 - Recovery
 - Original data for classification in error
 - No change is needed

B. New Recovery Priority Number NA

C. If applicable, indicate the Listing and Reclassification Priority Number: 6 (Unpetitioned action with low management impact)

IV. RECOMMENDATIONS FOR FUTURE ACTIONS

Our only recommendation is that Service field office biologists remain prepared to take appropriate actions should individuals or populations of these species be discovered in the future.

V. REFERENCES

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Photo Credit: Lorene Steinberg, Smithsonian Institution Department of Zoology

Figure 1. Upland combshell [synonymy: *Unio compactus* Lea, 1859]; Type locality: Etowah River, Georgia, Bishop Elliott and Reverend G. White, Lectotype. Specimens are located in the Department of Invertebrate Zoology Collections, Smithsonian National Museum of Natural History (USNM 84447).



Photo Credit: Lorene Steinberg, Smithsonian Institution Department of Zoology

Figure 2. Southern acornshell [synonymy: *Unio othcaloogensis* Lea, 1857]; Type locality: Othcalooga Creek, Gordon County, Georgia, Bishop Elliott, Lectotype. Specimens are located in the Department of Invertebrate Zoology Collections, Smithsonian National Museum of Natural History (USNM 84615).

U.S. FISH AND WILDLIFE SERVICE
5-YEAR REVIEW
Upland Combshell (*Epioblasma metastrata*)
Southern Acornshell (*Epioblasma othcaloogensis*)

Current Classification: Endangered

Recommendation resulting from the 5-Year Review:

Downlist to Threatened

Uplist to Endangered

Delist

No change needed

Review Conducted By: Anthony Ford, Alabama Ecological Services Field Office.

FIELD OFFICE APPROVAL:

Lead Field Supervisor, Fish and Wildlife Service

Approve WILLIAM PEARSON Digitally signed by WILLIAM PEARSON
Date: 2018.08.20 13:52:50 -05'00' Date _____

Assistant Regional Director, Fish and Wildlife Service

Approve  Date 10/15/18

APPENDIX A: Summary of peer review for the 5-year review of the upland combshell and southern acornshell.

A. Peer Review Method: see below

B. Peer Review Charge:

Requests were made to each peer reviewer of the 5-year review via personal phone conversation and/or email request.

We chose peer reviewers based on their expertise and the broad knowledge that they could offer in giving a complete and thorough review. Each reviewer was asked to give a complete review with focus on areas of personal expertise.

Dr. Paul Johnson is the program supervisor of the ADCNR's Alabama Aquatic Biodiversity Center (AABC) and is a recognized mollusk expert with direct survey experience and knowledge in the historic range of these mussels.

Mr. Jeff Garner is the mussel management supervisor and malacologist for ADCNR and has extensive survey experience and expert knowledge in the historic range of these mussels.

Mr. Jason Wisniewski is a malacologist for the Georgia Department of Natural Resources, Nongame Conservation Section, with direct survey experience and expert knowledge in the historic range of these mussels.

C. Summary of Peer Review Comments/Report

Dr. Paul D. Johnson, ADCNR, Alabama Aquatic Biodiversity Center, Marion, AL: No changes were suggested.

Mr. Jeff Garner, ADCNR, Florence, AL: No changes were suggested.

Mr. Jason Wisniewski, GDNR, Social Circle, GA: No changes were suggested.

D. Response to Peer Review

Dr. Paul D. Johnson, ADCNR, Alabama Aquatic Biodiversity Center, Marion, AL: No changes were suggested or incorporated.

Mr. Jeff Garner, ADCNR, Florence, AL: No changes were suggested or incorporated.

Mr. Jason Wisniewski, GDNR, Social Circle, GA: No changes were suggested or incorporated.