

Painted Snake Coiled Forest Snail
(Anguispira picta)

**5-Year Review:
Summary and Evaluation**

**U.S. Fish and Wildlife Service
Southeast Region
Cookeville Ecological Services Field Office
Cookeville, Tennessee**

5-YEAR REVIEW
Painted snake coiled forest snail / *Anguispira picta*

I. GENERAL INFORMATION

A. Methodology used to complete the review: In conducting this 5-year review, we relied on available information pertaining to historic and current distributions, life history, and habitat of this species. Our sources include the final rule listing this species under the Endangered Species Act; the recovery plan; unpublished field observations by Service, State and other experienced biologists; unpublished survey reports; and notes and communications from other qualified biologists or experts. We published an announcement in the *Federal Register* requesting information on this species on September 20, 2005 (70 FR 55157) and a 60-day comment period was opened. No comments were received that provided new information concerning *Anguispira picta*. We distributed a draft of this document for peer review to the author of the species' Recovery Plan, a biologist for the Tennessee Division of Natural Areas, and three academicians with considerable malacological experience or experience working with members of the genus *Anguispira* (see Peer Review section).

B. Reviewers

Lead Region – Southeast Region: Kelly Bibb, 404-679-7132

Lead Field Office – Cookeville, Tennessee, Ecological Services: Geoff Call, 931-528-6481

C. Background

1. **FR Notice citation announcing initiation of this review:** September 20, 2005, 70 FR 55157

2. **Species status:** Stable (2005, 2006, and 2007 Recovery Data Call)

3. **Recovery achieved:** 2 = 26 – 50% recovery objectives achieved (2005, 2006, and 2007 Recovery Data Call)

4. **Listing history**

Original Listing

FR notice: 43 FR 28932

Date listed: July 3, 1978

Entity listed: Species

Classification: Threatened

5. **Review History:**

Recovery Data Call: 2007, 2006, 2005, 2004, 2003, 2002

Final Recovery Plan: 1982

Previous 5-year review for *A. picta* was noticed on November 6, 1991 (56 FR 56884). In this review, different species were simultaneously evaluated with no

species-specific, in-depth assessment of the five factors, threats, *etc.* as they pertained to the different species' recovery. The notices summarily listed these species and stated that no changes in the designation of these species were warranted at that time. In particular, no changes were proposed for the status of *A. picta*.

6. Species' Recovery Priority Number at start of review (48 FR 43098):
8 (degree of threat is moderate, potential for recovery is high, and taxonomy is at the species level)

7. Recovery Plan or Outline

Name of plan: Recovery Plan for Painted Snake Coiled Forest Snail

Date issued: October 14, 1982

Dates of previous revisions: NA

II. REVIEW ANALYSIS

A. Application of the 1996 Distinct Population Segment (DPS) policy: Not applicable. The painted snake coiled forest snail is an invertebrate, and therefore not covered by the DPS policy; and the other DPS related questions will not be addressed in this review.

B. Recovery Criteria

1. Does the species have a final, approved recovery plan containing objective, measurable criteria? The plan contains a recovery objective, but does not articulate recovery criteria. However, the plan stipulates that "unless significant populations of *A. picta* are found outside Buck Creek Cove and preclude the need for further protection of the species, it shall not be considered recovered until..." certain conditions are met. For the purposes of this review, those conditions are listed and treated as recovery criteria below.

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? No – The recovery objective and related criteria in the Recovery Plan for *A. picta* were developed at a time when the species was thought to be restricted to approximately 325 acres in the vicinity of Buck Creek Cove. Withers (2003, 2004) extended the known range to occupy approximately 1,950 acres, distributed in a narrow vertical band along approximately 9.8 miles of Cumberland Plateau escarpment in Crow Creek Valley. The Recovery Plan lists timber harvesting, limestone quarrying, and forest fire as potential threats to the species. Limestone quarrying is now an imminent threat within a portion of the species' range at the location of the historic Gager Lime Mine. Timber harvesting and forest fire remain as potential

threats, and habitat modification due to residential development has emerged as a threat.

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)? No

3. Recovery Criteria:

1. A. picta and its habitat are protected from human-related threats and/or modifications that would endanger the species' existence.

This has not been met. This criterion addresses listing factor A (present or threatened destruction, modification or curtailment of its habitat or range). No habitat containing *A. picta* has been protected through land purchase, establishment of a conservation easement, or other binding agreement. The entire range of the species occurs on private lands. Within these private lands, a project is underway to reopen a limestone quarry in the northern extent of the range of *A. picta*, on the eastern slope of Crow Creek valley, north of Youngs Creek. The quarry has begun extraction from a five-acre ore block, which does not contain habitat occupied by *A. picta*. However, future plans call for expansion into a 300-acre area, which contains a substantial portion of the known range of the species. Development of this quarry will not only destroy a considerable amount of occupied habitat, it will fragment the northern extent of the species' range from currently contiguous habitats extending along the southeast slope of Crow Creek valley, limiting dispersal potential between the two. This could prevent recolonization of suitable habitat should localized extinctions occur, disrupting metapopulation processes.

2. No evident natural threats exist which would likely endanger the species existence.

This has been met. This criterion addresses listing factor C, disease or predation, and listing factor E, other natural or manmade factors threatening its continued existence. Neither of these listing factors is relevant based on current knowledge. No natural threats that would likely endanger the species existence were evident at the time the Recovery Plan was completed, and none are currently evident.

3. A population monitoring program is established and conducted for 4 to 5 years to establish "normal" distribution and abundance for the species and no downward trend is evident.

No monitoring program has been established for *A. picta*.

4. **A means is established to assure that population monitoring will be conducted periodically after delisting.**

No monitoring program has been established for *A. picta*.

5. **Collection of the species for scientific or other purposes is controlled or is proven not to threaten the species' continued existence.**

This criterion addresses listing factor B: overutilization for commercial, recreational, scientific, or educational purposes. Collection of *A. picta*, beyond that which is permitted by the Tennessee Wildlife Resources Agency or the U.S. Fish and Wildlife Service, is not thought to pose a threat to *A. picta*. Requests for collecting permits submitted to either of these agencies are reviewed with consideration for the scientific benefits they would provide and for the potential of the desired collections to adversely affect the conservation status of the species.

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:

Withers (2003, 2004) found *A. picta* to be locally abundant in its historic known range within Buck Creek Cove, near the town of Sherwood, Tennessee. Based on occurrence data from the Recovery Plan and Withers' report, the species appears to have remained stable; though, quantitative analysis of these data is not possible. The Recovery Plan reported the snail population to have been estimated at 2000 individuals by a prior researcher, but also speculated, based on available habitat within the range known at that time, that the population could have been as much as 10 times greater. Withers provided no population estimate, rather his work focused on documenting the species' distribution, which he found to extend well beyond the previously known range (see Section C.1.d). The Recovery Plan reported that a survey of undisturbed areas revealed several size classes of snails, ranging from 4 – 20 mm, indicating recent reproduction and presumed population viability. In at least one location, Withers also observed three distinct age (i.e., size) classes of *A. picta* on what he termed "nursery rocks".

b. Genetics, genetic variation, or trends in genetic variation (e.g., loss of genetic variation, genetic drift, inbreeding, etc.): None

c. Taxonomic classification or changes in nomenclature: None

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

The Recovery Plan for *A. picta* describes this species' range as restricted to Buck Creek Cove, southwest of Sherwood, Franklin County, Tennessee. Within Buck Creek Cove, *A. picta* was reported to occur primarily between the elevations of 750 to 930 feet, with at least one specimen found in a well-watered, protected spot on a north-facing slope at 1,500 feet elevation. Suitable habitat within the cove was estimated to include approximately 325 acres.

Surveys conducted by Withers (2003, 2004) expanded the known range of *A. picta* to include an estimated 5.3 miles and 4.5 miles of Cumberland Plateau escarpment on the west and east sides of the Crow Creek Valley, respectively. The range documented by Withers on the west side of Crow Creek extends approximately 1 mile further south and 3 miles further north than the range depicted in the species Recovery Plan, which was restricted to the vicinity of Buck Creek Cove. Withers found *A. picta* to be most densely populated in Crabtree Hollow, the mouth of which is approximately 2 air miles north of the mouth of Buck Creek Cove on the west side of Crow Creek. The population documented by Withers on the east side of Crow Creek extends from approximately 0.7 mile north of the historic Gager Lime Mine, in the town of Sherwood, to approximately 2.6 miles south of the mine. This population also extends approximately 1 mile east from the mine into Youngs Creek Cove. Withers found that *A. picta* occurred between 800 and 1300 feet elevation.

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

The habitat description given in the Recovery Plan is generally consistent with recent observations. However, Withers found evidence that populations of *A. picta* may tolerate limited forest canopy removal and a potentially wider range of humidity at the microenvironmental scale. Withers found *A. picta* inhabiting forests of multiple ages, indicating the species is able to either tolerate some level of timber harvest or to recolonize harvested areas once forest regeneration produces suitable conditions. The species was found in portions of Buck Creek Cove that were logged by mule circa 1980 and judged to have "recovered significantly since then." Withers noted that a portion of Crabtree Hollow, where he found *A. picta* to be most densely populated within its range, was timbered circa 1992. This harvest was done under a minimum diameter restriction, and was closely monitored by the property owner.

Similarly, much of the Gager Lime Mine property was timbered circa 1980, and *A. picta* was found to be locally abundant in forested areas of the property. Withers observations of *A. picta* occurrences on west and south facing slopes indicate a potential tolerance of lower microenvironmental humidity than suggested in the Recovery Plan, though he did comment that xeric conditions on slopes with limited cover and southwest aspects appeared unsuitable. Conversely, Withers found *A. picta* absent in areas containing apparently suitable habitat. Possible explanations for such absence could include differences in limestone mineralogy that prevent *A. picta* establishment and survival, absence of suitable forage, barriers to dispersal between patches of occupied and unoccupied suitable habitat, or simple failure to detect *A. picta* in spite of its presence. These observations demonstrate the need for investigations to determine how microhabitat characteristics, their arrangement on the landscape, trophic interactions, and dispersal ability of *A. picta* influence the species' distribution.

In preparing this review, we analyzed land cover to determine the extent of forested habitat within the range of *A. picta* (Table 1). This analysis was based on the Environmental Protection Agency's National Land Cover Data for the years 1992 and 2001, which are available over the internet (<http://www.epa.gov/mrlc/nlcd.html>). We calculated the number of acres existing in broad cover classes in each of the two years and assessed changes in the amount of each class over the entire range of the species between 1992 and 2001. The range of the species was defined using polygons delineated by Withers (2003) to represent the population boundaries on the east and west sides of Crow Creek Valley and includes approximately 1,950 acres.

Table 1. Number of acres of forested habitats within range of *Anguispira picta* based on analysis using EPA National Land Cover Dataset, 1992 and 2001. Total species range encompasses approximately 1,950 acres.

| Cover Class | 1992 | 2001 | Change |
|------------------|--------|--------|--------|
| Deciduous Forest | 1734.9 | 1818.9 | 84 |
| Evergreen Forest | 26.9 | 14.0 | -12.9 |
| Mixed Forest | 179.8 | 94.5 | -85.3 |

Forested habitat is currently abundant within the known range of *A. picta* and has remained relatively stable during the period between 1992 and 2001, though evergreen and mixed forest types have declined. Data for both 1992 and 2001 depict a landscape that was at least 98% forested habitat within the known range of *A. picta*. Within forested habitats, deciduous forest cover dominated by a wide margin and increased slightly during the period of analysis. The species' Recovery Plan describes the vegetation in which *A. picta* habitat is found as consisting of deciduous forest cover, so the loss of the minimal evergreen and mixed forest

components since 1992 are not cause for concern, especially given the commensurate increase in deciduous forest during the same period.

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

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

The threatened destruction, modification, or curtailment of habitat within the range of *A. picta* extends primarily from three land uses: timber harvest, residential development, and limestone quarrying. Much of the Cumberland Plateau escarpment forest in the vicinity of Sherwood has been logged in the past, as evidenced by current forest structure, though the timing and intensity of such activity are not well documented. Due to the fact that *A. picta* occurs solely on private lands, on which timber harvesting is not subjected to coordination with state or Federal agencies in Tennessee, destruction or modification of habitat through timber harvest is unregulated. Although the take prohibitions of section 9 of the Act do apply to timber harvest activities and their effects on *A. picta*, enforcement of these prohibitions has been, to date, unattainable. The Service is not informed when timber harvest activities are being considered, planned, or implemented; therefore, we have no opportunity to provide input into the design of the project or the need for a section 10 permit. Unlike higher profile species, conservation of *A. picta* is not valued by most of the public to the extent that citizens would report to the Service the likelihood of habitat destruction or illegal taking. While distribution data suggest some tolerance of canopy removal or an ability to recolonize areas following such disturbance, the immediate effects on *A. picta* or the duration of any such effects remain unstudied.

Residential development poses an indirect threat in the form of potential habitat modification. Residential development on the Cumberland Plateau, from which Crow Creek valley receives surface runoff, has increased in recent years. Such development could alter surface runoff patterns by increasing impermeable surfaces and reducing forest cover, potentially altering soil moisture and microenvironmental humidity regimes in down-gradient escarpment habitats. The consequences of such changes for forested escarpment habitats and potential alteration of microenvironmental conditions in snail-inhabited limestone outcrops are unknown.

The potential threat of limestone quarrying exists throughout the range of *A. picta* and is imminent in one location as evidenced by the opening in 2007 of the Sherwood Quarry. In October 2004, an investor purchased a 3,234-acre tract containing the historic Gager Lime Mine for the purpose

of establishing the Sherwood Quarry. In December 2004, the Franklin County Board of Commissioners, with strong community support, approved 300 acres of this property for rezoning to allow operation of a limestone quarry. In a letter dated November 1, 2004, the Cookeville Field Office notified the landowner of the presence of *A. picta* within the property, explained take prohibitions included in section 9 of the Endangered Species Act, as amended, and suggested that the landowner develop a habitat conservation plan and apply for an incidental take permit as a remedy for seeking relief from prohibitions imposed by section 9.

Through a series of surveys for *A. picta* in the proposed mine site and meetings with the Service that occurred during 2005, the landowner identified a five-acre parcel in which mining could be initiated without threat of take occurring. The quarry owner acquired air quality and storm-water runoff permits for operations in this parcel and began extraction in 2007. This five-acre parcel is expected to provide a quantity of material that will support quarry operations for no more than two to three years, during which time the property owner has indicated he will develop a HCP for longer-term operation of the mine unless the project is found to require a section 404 permit under the Clean Water Act. Should the Corps of Engineers assert jurisdiction over the long-term quarry operation by requiring a section 404 permit, then potential impacts of the project to *A. picta* would be addressed through section 7 consultation between the Corps and the Service.

While the initial phase of extraction at the Sherwood Quarry is not expected to result in take, phase two will result in destruction of habitat containing approximately 10 percent of currently known occurrences of this species. The severity of this impact would be amplified by the fact that the destruction of this habitat will fragment the northernmost extent of the range of *A. picta* on the east side of Crow Creek valley from its more extensive populations to the south of the proposed quarry. This could prevent recolonization of suitable habitat in the northern extent of the species' range should localized extinctions occur, disrupting metapopulation processes and potentially resulting in contraction of the species' range.

The threats posed to *A. picta* habitat by timber harvesting and limestone quarrying were discussed in the species' Recovery Plan and remain today. The Service is working with the Sherwood Quarry to avoid, minimize, and mitigate for impacts that will be caused by their limestone extraction. The growth in residential development on the Cumberland Plateau, in close proximity to the escarpments bounding Crow Creek valley, poses a new threat to *A. picta* habitat that was not recognized in the Recovery Plan. This threat has emerged because the Cumberland Plateau is now recognized as a desirable region for residential development.

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

Collecting of *A. picta*, beyond that which is permitted by the Tennessee Wildlife Resources Agency or the U.S. Fish and Wildlife Service, is not thought to pose a threat to *A. picta*. Requests for collecting permits submitted to either of these agencies are reviewed with consideration for the scientific benefits they would provide and for the potential of the desired collecting to adversely affect the conservation status of the species.

c. Disease or predation: This is not a known threat to *A. picta*.

d. Inadequacy of existing regulatory mechanisms:

Inadequacy of existing regulatory mechanisms poses a threat to *A. picta* both with respect to timber harvest and limestone quarrying on private lands. In Tennessee, adherence to best management practices for forestry activities is voluntary and no federal regulatory nexus exists for such activities. Given the prevalence of privately owned, forested habitat within the known range of *A. picta*, the likelihood for unauthorized incidental take to occur during timber harvest is great. As discussed previously, there is no mechanism through which the Service is informed concerning the planning of timber harvest activities and, therefore, there is no opportunity for the Service to provide guidance regarding project design or section 10 permit requirements. However, the long-term consequences of such unauthorized incidental take with respect to survival and recovery of this species are unknown.

Limestone quarrying is not regulated by the federal Office of Surface Mining. In Tennessee, such activities are only subjected to State air and water quality regulations unless they would result in the discharge of fill materials into the waters of the United States, in which case they would require a section 404 permit from the Corps of Engineers under the Clean Water Act. The opening in 2007 of the Sherwood Quarry on a property containing a substantial portion of the known range of *A. picta*, combined with the fact that *A. picta* is essentially restricted to limestone outcrops throughout its range in Crow Creek Valley, poses a substantial threat to the species. The absence of a federal nexus concerning limestone quarrying presents a gap in the regulatory protection of *A. picta*.

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

The Recovery Plan lists forest fire as a threat to *A. picta* habitat.

Extensive forest fire poses a threat to *A. picta* habitat because of the possibility for severe fires to cause extensive mortality of canopy trees, disrupting microenvironmental regimes. Forest fires could also result in direct mortality in some circumstances, though the crevice-dwelling behavior of *A. picta* might be effective in reducing such mortality.

II.D. Synthesis

The Recovery Plan for *A. picta* reflects both the known status of the species and threats to it at the time it was prepared. Because significant changes have occurred in each of these factors since the plan was prepared in 1982, this five-year review provides a more current assessment of the species' status and the factors that should be addressed for recovering the species. Specifically, the species range is now known to encompass limestone outcrops within approximately 1,950 acres along 9.8 miles of the Cumberland Plateau escarpment in the Crow Creek drainage, rather than the 325 acres that were estimated in the Recovery Plan to be occupied in Buck Creek Cove. Microhabitat characteristics for this species require investigation, as evidenced by observations of *A. picta* in habitats that have typically been considered unsuitable for the species. However, *A. picta* remains a narrowly distributed species, and reliable estimates of abundance are needed to provide a basis for monitoring trends.

Countering the increase in the documented range is the now imminent threat posed by development of a limestone quarry that would affect approximately 10 percent of the known occurrences of the species. Also, the threat of timber harvest on private lands throughout the range of the species remains and will continue until habitat protection is secured either through property acquisition or negotiation of conservation easements or other binding agreements with property owners. Studies of the ability of *A. picta* to tolerate limited canopy removal or to repopulate areas in which timber harvests have occurred are needed and should be addressed through such agreements when the opportunity is available. Residential development on the Cumberland Plateau has emerged as an additional threat to *A. picta* habitat since the species' Recovery Plan was completed. Due to continued habitat destruction from limestone and timber extraction, the threat of habitat alteration due to residential development on the Cumberland Plateau, and the inadequacy of existing regulatory mechanisms for abating these threats, *A. picta* still meets the definition of a threatened species.

III. RESULTS

- A. **Recommended Classification:** No change is needed. *A. picta* should remain classified as a threatened species because it is narrowly distributed solely on private property and an increase in timber harvest rates or extensive limestone quarry development within the species' range could cause the species to become endangered within the foreseeable future throughout all or a significant portion of

its range. Potential habitat alteration resulting from residential development on the Cumberland Plateau also poses a threat to the species.

B. New Recovery Priority Number: 8C

The change from a recovery priority number of 8 to 8C is recommended because of the recent opening of a limestone quarry within the range of *A. picta*, creating a conflict between conservation of the species and locally supported economic development on private property. The Service expects to resolve this conflict through means available under either section 7 or section 10 of the Endangered Species Act.

IV. RECOMMENDATIONS FOR FUTURE ACTIONS

- A. Protect habitat on the east and west sides of Crow Creek Valley through either property acquisition by a government agency or conservation organization or by securing conservation easements or other binding agreements with private property owners. Pursue opportunities for developing habitat conservation plans or safe harbor agreements when appropriate.
- B. Develop and implement a monitoring program for *A. picta* that tracks fluctuations in patch occupancy in specific locations and incorporates measures of population abundance, density, and/or frequency of occurrence in those patches.
- C. Investigate the influence of microhabitat factors, including but not limited to soil moisture, relative humidity, limestone mineralogy, leaf litter, and canopy cover on the distribution of *A. picta*.
- D. Investigate life history, foraging behavior, and food preferences of *A. picta*. Recovery efforts for this species are hindered by a lack of basic information on reproductive biology, demographics, dispersal ability, and food habits.
- E. Investigate the relationship between presence of dead shell of *A. picta* and extant populations of the species. Many of the observations reported by Withers (2003, 2004) that form the basis for estimating the current range of the species were of dead shell. In estimating the species range from such data, it is assumed that dead shell would be persistent for only a short duration following individual mortality and, therefore, represents an extant occurrence. Such a study should also explore the relationship between abundance of dead shell and live specimen abundance to permit incorporation of observations of dead shell into programs to monitor trends in the status of *A. picta*.
- F. Develop a revised Recovery Plan that reports the current known distribution of *A. picta* and includes a five-factor analysis, measurable and objective recovery criteria, and revised recovery tasks.

- G.** Conduct an outreach and education campaign directed toward the residents of the town of Sherwood, Crow Creek Valley, and civic leaders in Franklin County. Such a program should familiarize the target audience with the knowledge that an endemic, federally protected species is dependent upon conservation of the forested ecosystem of the Cumberland Plateau escarpment in Crow Creek Valley.

V. REFERENCES

U.S. Fish and Wildlife Service. 1982. Recovery Plan for Painted Snake Coiled Forest Snail. 26 pp.

Withers, D. I. 2003. Distributional surveys for the painted snake coiled forest snail (*Anguispira picta*). Final Report, Revenue Grant #1448-40181-02-G-051. 19 pp.

Withers, D. I. 2004. Distributional surveys for the painted snake coiled forest snail (*Anguispira picta*). Addendum to Final Report, Revenue Grant #1448-40181-02-G-051. 11 pp.

U.S. FISH AND WILDLIFE SERVICE
5-YEAR REVIEW of *Anguispira picta*

Current Classification: **Threatened**

Recommendation resulting from the 5-Year Review: **No change is needed**

Review Conducted By: **Geoff Call**

FIELD OFFICE APPROVAL:

Lead Field Supervisor, Fish and Wildlife Service

Approve *Leslie Barclay* Date *1/02/08*

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 *Gloria Bell* Date *1/16/08*
Acting ARD-ES

APPENDIX A: Summary of peer review for the 5-year review of the painted snake coiled forest snail (*Anguispira picta*)

A. Peer Review Method: see below

B. Peer Review Charge: Request sent (email – dated 07/25/2006) to potential reviewers requesting comments on the 5-year review. Request was sent to Dr. Stephanie Clark (University of Alabama), Dr. David Haskell (University of the South), Dr. John Slapcinsky (Florida Museum of Natural History), Mr. David Withers (Tennessee Natural Heritage Program), and Mrs. Amy VanDevender (Recovery Plan author).

As each of you may know, on September 20, 2005, the U.S. Fish and Wildlife Service published a notice in the Federal Register announcing a 5-year review of 14 species, among which *Anguispira picta* was included. The purpose of a 5-year review is to ensure that the classification of species as threatened or endangered on the List of Endangered and Threatened Wildlife and Plants (50 CFR 17.11 and 17.12) is appropriate. I am responsible for preparing the review for *Anguispira picta* and coordinating peer reviews of any new information included in this review. I expect to have a draft copy of the review available by August 1, 2006, and would like to request your participation as a peer reviewer of the sections presenting data that have been generated concerning status, distribution, and threats since the publication of the Recovery Plan in 1982. The format is standardized according to Service policy and guidance, and the sections you would be reviewing consist of approximately 5-6 pages. The review would have to be completed by August 31. If you would be willing to serve as a peer-reviewer of this 5-year review, please let me know. Thanks very much for considering this request.

Sincerely,
Geoff

Geoff Call
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U.S. Fish and Wildlife Service
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C. Summary of Peer Review Comments/Report:

Dr. David Haskell suggested adding a statement concerning habitat fragmentation that would be caused by development of the Sherwood Quarry and its potential to affect viability of snails outside the area in which habitat would be destroyed. Other comments provided by Dr. Haskell were generally supportive of the materials he reviewed.

Mr. David Withers expressed disagreement with the statement that limestone extraction in the initial five-acre ore block to be exploited by Sherwood Quarry would not result in take of *A. picta*. Mr. Withers also expressed his opinion that two federal nexus exist with respect to limestone quarrying in Tennessee, as these activities are regulated by the Tennessee Department of Environment and Conservation (TDEC) under authority granted by the Environmental Protection Agency (EPA). Were the EPA to exercise such federal nexus, extraction of the initial five-acre ore block at the Sherwood Quarry would be subjected to consultation with the Service under section 7 of the Endangered Species Act. Mr. Withers also expressed his opinion that *A. picta* should be elevated to endangered status.

Mrs. Amy VanDevender suggested greater interaction with landowners is needed for conservation of *A. picta*. Mrs. VanDevender also mentioned an ongoing study of the genus *Anguispira* at the University of Southern Illinois and cautioned against conducting population experiments to see if *A. picta* can survive drier conditions. Mrs. VanDevender reported having looked, unsuccessfully, for “other versions of the keeled *Anguispira*” in south central Tennessee and northern Alabama during recent years.

We did not receive reviews from Dr. John Slapcinsky or Dr. Stephanie Clark.

D. Response to Peer Review –

We agree with the comment offered by Dr. Haskell concerning the potential effects of habitat fragmentation that could result from the Sherwood Quarry and have added text to this effect in this review.

While we respect Mr. Withers’ opinion concerning the potential for take during extraction of the initial five-acre ore block at the Sherwood Quarry, the Service does not possess sufficient evidence to conclude that take would occur from the proposed extraction. The Service recognizes that continued extraction beyond the five-acre ore block would undoubtedly result in take and is working with the Sherwood Quarry to address this either through development of a habitat conservation plan or, if the Corps of Engineers issues a section 404 permit for the project, through section 7 consultation. Mr. Withers’ assertion that a federal nexus is presented by TDEC’s issuance of air quality and construction storm-water permits under authority provided by the EPA is not supported by EPA policy in these matters. Finally, the Service respectfully disagrees with Mr. Withers’ assertion that the status of *A. picta* should be changed from listed as threatened to listed as endangered. While the threats to *A. picta* could increase in the future and necessitate such a change, we do not currently believe that the species is in danger of extinction across all or a significant portion of its range.

We agree with Mrs. VanDevender’s comment that additional interaction with landowners is needed to promote the conservation of *A. picta*. Section IV.G. of this review recommends development of an outreach program.