

Supplemental Information for the Bluenose Shiner

Biological Status Review Report



The following pages contain peer reviews received from selected peer reviewers, comments received during the public comment period, and the draft report that was reviewed before the final report was completed

March 31, 2011

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Peer review #1 from Dr. Mary Freeman

From: Mary Freeman
To: Imperiled
Cc: Hoehn, Ted; Mary Freeman
Subject: review of BSR reports
Date: Monday, January 31, 2011 10:53:24 AM
Attachments: Blackmouth Shiner Final Draft BSR 12-8-2010_freeman.doc
ATT00001.htm
Bluenose Shiner Final Draft BSR 12-9-10_freeman.docx
ATT00002.htm

Dr. Haubold,

Per your request, I have reviewed the draft Biological Status Reviews for the Blackmouth Shiner and the Bluenose shiner, in the context of the FWC rules for listing species as "Threatened". My assessments for the reviews of each of these two species are detailed below. I am also returning the review documents with comments added as "track changes", to indicate a few instances where I believe clarification of intended meanings may be warranted.

I appreciate this opportunity to comment.

Best regards,

Mary Freeman, PhD
U.S. Geological Survey
Patuxent Wildlife Research Center
University of Georgia
Athens, GA 30602
706 583 0978

Review comments: Bluenose Shiner Final Draft BSR 12-9-2010

The Biological Status Review recommends that the Bluenose shiner, *Pteronotropis welaka*, be listed as a State-designated Threatened species in Florida, citing criteria "B2bc". Criterion B2, area of occupancy (B2) < 2000 km², appears clearly met. The Biological Review Group (BRG) estimates that the area currently occupied in FL by *P. welaka* (i.e., based on HUC12 subwatersheds where the species has been collected since 1980) would provide at most 920 km² occupied habitat area. The actual occupied habitat area is certainly less, because the estimate includes total stream lengths within the occupied subwatersheds, and an assigned width of 0.4 km; the actual area of suitable habitat for the species (slow-flowing, often vegetated stream habitat with acceptable water quality) is less than the estimated 920 km². Additionally, criterion B2b is met by the apparent strong decline in extent of occurrence in the St Johns River drainage, where the species has not been located in at least 15 years, including in recent targeted surveys. Finally, the BRG cites

evidence of extreme fluctuations in the numbers of mature individuals (criterion B2c). High population variability is common in short-lived species such as *P. welaka*, and contributes to higher risk of local extirpation. Local extirpation of species that occupy a limited number of sites increases the probability of species extinction. Based on the evidence presented, which does not to my knowledge contradict any other information available for *Pteronotropis welaka*, the recommendation of listing as a state-designated Threatened species appears valid and justified.

**Biological Status Review
for the
Bluenose shiner
*Pteronotropis welaka***

EXECUTIVE SUMMARY

The Florida Fish and Wildlife Conservation Commission (FWC) directed staff to evaluate all species listed as Threatened or Species of Special Concern as of September 1, 2010. Public information on the status of the bluenose shiner (*Pteronotropis welaka*) was sought from September 17 to November 1, 2010. A biological review group (BRG) met on November 18, 2010. Group members were Noel Burkhead (USGS), William Tate (USFWS), and Theodore Hoehn (FWC). In accordance with rule 68A-27.0012 Florida Administrative Code (F.A.C.), the BRG was charged with evaluating the biological status of the bluenose shiner using criteria included in definitions in 68A-27.001(3) and following the protocols in the *Guidelines for Application of the IUCN Red List Criteria at Regional Levels (Version 3.0)* and *Guidelines for Using the IUCN Red List Categories and Criteria (Version 8.1)*. Please visit http://www.myfwc.com/WILDLIFEHABITATS/imperiledSpp_listingprocess.htm to view the listing process rule and the criteria found in the definitions.

The BSG concluded from the biological assessment that the bluenose shiner met criteria B2bc. FWC staff recommends that the bluenose shiner be listed as a state-designated Threatened species.

This work was supported by a Conserve Wildlife Tag grant from the Wildlife Foundation of Florida.

BIOLOGICAL INFORMATION

Taxonomic Classification – This biological status report is for the bluenose shiner, *Pteronotropis welaka*, in Florida. Evermann and Kendall (1898).

Life History References – Albanse et al. (2007), Bass & Hoehn (Manuscript), Bass et.al. (2004), Fletcher (1993), Gilbert (1992), Johnson and Knight (1999), Osprey Data International, Inc. (2001).

Geographic Range and Distribution – The bluenose shiner, *Pteronotropis welaka*, is found in southern Coastal Plain streams from Florida to Louisiana. It is very fragmented in occurrence throughout its range (Albanse et al., 2007). In Florida there are two disjunct distributions, the St. Johns River basin and the western panhandle (Figure 1), with no known occurrences between the St. Johns and the Apalachicola rivers (Gilbert, 1992). The first specimens were collected from the St. Johns River, near Welaka, in 1897 by William C. Kendall

(Bass and Hoehn, 2010).



Figure 1. Distribution and Range for the bluenose shiner, *Pteronotropis welaka* (source: Bass and Hoehn, 2010).

Population Status and Trend – The bluenose shiner has undergone a precipitous decline in the St. Johns River Drainage since the 1970s. None were found there in the 2004 statewide Imperiled Species Survey Project (Bass et al., 2004), and none were collected in a recent intensive survey of Alexander Springs using multiple sampling techniques (Steve Walsh, USGS, personal communication). Bluenose shiners were collected from 21 sites in northwestern Florida in the Imperiled Species Survey Project (Bass et al., 2004). Drainages harboring bluenose shiners included the Escambia, Choctawhatchee, and Yellow rivers. Bluenose shiners were not found during this survey effort at some sites that were known to previously contain them.

Comment [mcf1]: Could you say how many formerly occupied sites were surveyed without success?

Quantitative Analyses – There have been no population viability analyses (PVA) or other quantitative models conducted that include in their results a probability of extinction for the species.

BIOLOGICAL STATUS ASSESSMENT

Threats - The disjunct population centers and the isolated areas where the bluenose shiner have been collected make the species vulnerable to local extinction (Albanse et al., 2007). Many of the sub-watersheds inhabited by bluenose shiners do not meet water quality standards as determined by the Florida Department of Environmental Protection (DEP) (Hoehn, 1998). The DEP impaired waters data from 1998-2007 indicate that several of the sub-watersheds have elevated nutrients.

The “Florida 2060” research project prepared for 1000 Friends of Florida presents a scenario of development in many of the watersheds and sub-watersheds that contain bluenose shiners (Zwick and Carr, 2006). While some of the sub-watersheds are in conservation lands, those in the Wekiva River, Yellow River, Shoal River and Escambia River basins are expected to increase in development pressures over the next 10-50 years (Zwick and Carr, 2006). Changes

from light to moderate agriculture to residential development may result in increased nutrients and turbidity, changes to other water quality parameters, habitat loss, and increased consumptive use of water (Hoehn, 1998).

The panhandle sub-watersheds face an increasing threat due to the possible development of water supply reservoirs beyond 2025. Preliminary work has identified several sites for these reservoirs in Okaloosa County (NFWFMD, 2008). There have also been discussions over the past 15 years of constructing a dam on the Yellow River near Crestview, Florida.

Statewide Population Assessment - Findings from the BRG are included in Biological Status Review Information tables.

LISTING RECOMMENDATION – Staff recommends that the bluenose shiner be listed as a Threatened species because the species meets criteria for listing as described in 68A-27.001(3), F.A.C.

SUMMARY OF THE INDEPENDENT REVIEW – *this will be completed after the peer review*

Peer review #2 from Dr. Brett Albanese

From: Brett Albanese
To: Imperiled
Subject: Re: Bluenose shiner Draft BSR Report
Date: Wednesday, December 15, 2010 2:27:24 PM

Hi,

Is this what you are looking for? I wanted to get some feedback from you before working on any of the other species. Will an email work or do you need more official documentation?

Here is my review:

I concur with the decision to list the bluenose shiner as a threatened species in Florida. As stated in the listing document, this species has a small and highly fragmented range in Florida. Unsuccessful survey attempts in the St. Johns River system suggest that this population may be extirpated. The heart of the range in northwest Georgia faces many current and future threats, including nutrient pollution, reservoir development and general degradation of aquatic habitats associated with development. One threat not mentioned in the plan is from invasive species. The bluenose shiner is strongly associated with aquatic plants, which are often patchily distributed in coastal plain streams. Threats to this habitat type include replacement by non-native plants and grazing by introduced apple snails. I have no first hand knowledge that apple snails are currently impacting populations of bluenose shiners, but I do think this is an important potential threat to the species.

Thanks,

Brett Albanese
Brett Albanese, Ph.D.
Georgia Department of Natural Resources
Nongame Conservation Section
Wildlife Resources Conservation Center
2065 U.S. Highway 278 SE
Social Circle, GA 30025-4743

Peer review #3 from Dr. Gray Bass

From: Gray Bass [mailto:graybass43@live.com]
Sent: Monday, January 31, 2011 11:27 AM
To: Hoehn, Ted
Subject: Bluenose, Saltmarsh and Blackmouth reviews

Well, Ted, I ought'a be whipped with a three-day-old-dead eel. But, here, belatedly, are the reiviews for the Bluenose shiner, Saltmarsh topminnow, and Blackmouth shiner. (The Lake Eustis pupfish review has been sent to both Bill Johnson and yourself.) Actually, the review documents were attached to the original e-mails. However, the documents themselves were off-screen on my computer. The bureaucratic stuff took up all the normal attachment space. After you mentioned they were there, I found I could get to them by "scrolling right". At any rate, I used the versions you sent recently, except for the L. E. pupfish file.

Be good,
Gray

January 2011
To: Ted Hoehn, FWC
Bluenose shiner review (by Gray Bass)

Ted:

(1) Your assessment and conclusions regarding the Bluenose shiner are correct. I agree with Threatened status for this species.

(2) Comment: Bluenose shiners may be more numerous, in numbers of individuals and sites occupied, than believed. I suspect, on the basis of field observations over the years, it may be an inhabitant of floodplain swamps, in locations difficult to reach or sample. Most of the sites historically sampled were primarily easy-access locations.

Sincerely,

Gray Bass

Peer review #4 from Dr. Bernard Kuhajda

From: Bernard Kuhajda

To: Imperiled

Subject: Review of Biological Status Reviews for FWC

Date: Wednesday, February 02, 2011 3:49:17 PM

Attachments: Review of BSR Saltmarsh Topminnow *F. jenkinsi*.doc

Review of BSR Blackmouth Shiner *N. melanostomus*.doc

Review of BSR Bluenose Shiner *P. welaka*.doc

Attached please find reviews of Biological Status Reviews for FWC for three species, *Fundulus jenkinsi*, *Notropis melanostomus*, and *Pteronotropis welaka*. Let me know if you have any questions.

--

Bernard Kuhajda

Collections Manager

Department of Biological Sciences

Box 870345

University of Alabama

Tuscaloosa, AL 35487-0345

This is an independent review by Bernard Kuhajda of the draft Biological Status Review for the Bluenose Shiner (*Pteronotropis welaka*) by Noel Burkhead, William Tate, and Theodore Hoehn. This review is at the request of the Florida Fish and Wildlife Conservation Commission.

The biological review group (BRG) for the Bluenose Shiner concluded the species met criteria B2bc and Florida Fish and Wildlife Conservation Commission staff recommended that the species be listed as a state-designated Threatened species.

The appropriate literature has been cited and the threats to the species have been addressed. I agree with the BRG that the species meets criteria B2bc and should be considered as a state-designated Threatened species.

Ideally the BRG needs to show all collection sites on the map and also indicate areas that are considered a "single" location (21 total) to be used in listing criteria. Even though no specimens of the St. Johns River have been collected recently efforts should continue to look for extant populations in this drainage.

**Biological Status Review
for the
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*Pteronotropis welaka***

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specimens were collected from the St. Johns River, near Welaka, in 1897 by William C. Kendall (Bass and Hoehn, 2010).



Figure 1. Distribution and Range for the bluenose shiner, *Pteronotropis welaka* (source: Bass and Hoehn, 2010).

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Quantitative Analyses – There have been no population viability analyses (PVA) or other quantitative models conducted that include in their results a probability of extinction for the species.

BIOLOGICAL STATUS ASSESSMENT

Threats - The disjunct population centers and the isolated areas where the bluenose shiner have been collected make the species vulnerable to local extinction (Albanse et al., 2007). Many of the sub-watersheds inhabited by bluenose shiners do not meet water quality standards as determined by the Florida Department of Environmental Protection (DEP) (Hoehn, 1998). The DEP impaired waters data from 1998-2007 indicate that several of the sub-watersheds have elevated nutrients.

The “Florida 2060” research project prepared for 1000 Friends of Florida presents a scenario of development in many of the watersheds and sub-watersheds that contain bluenose shiners (Zwick and Carr, 2006). While some of the sub-watersheds are in conservation lands, those in the Wekiva River, Yellow River, Shoal River and Escambia River basins are expected to

increase in development pressures over the next 10-50 years (Zwick and Carr, 2006). Changes from light to moderate agriculture to residential development may result in increased nutrients and turbidity, changes to other water quality parameters, habitat loss, and increased consumptive use of water (Hoehn, 1998).

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Statewide Population Assessment - Findings from the BRG are included in Biological Status Review Information tables.

LISTING RECOMMENDATION – Staff recommends that the bluenose shiner be listed as a Threatened species because the species meets criteria for listing as described in 68A-27.001(3), F.A.C.

SUMMARY OF THE INDEPENDENT REVIEW – *this will be completed after the peer review*

LITERATURE CITED

- Albanese, B., Peterson, J.T., Freeman, B.J., Weiler, D.A. 2007. Accounting for incomplete detection when estimating site occupancy of Bluenose Shiner (*Pteronotropis welaka*) in southwest Georgia. *Southeastern Naturalist* 2007 6(4):657–668.
- Bass, G. and T. Hoehn (2010, unpublished manuscript). Florida Imperiled Fish Species, Florida Fish and Wildlife Conservation Commission, Tallahassee, Florida. 356 p.
- Bass, G., T. Hoehn, J. Couch, K. McDonald. 2004. Florida Imperiled Fish Species Investigations. Florida Fish and Wildlife Conservation Commission, Tallahassee, Florida. 59 p.
- Evermann, B.W., and W.C. Kendall. 1898. Descriptions of new or little-known genera and species of fishes from the United States. *Bulletin U.S. Fisheries Commission* (1897) 17:125-133.
- Fletcher, D.E. 1993. Nest association of dusky shiners (*Notropis cimmingsae*) and redbreast sunfish (*Lepomis auritus*), a potentially parasitic relationship. *Copeia* 1993(1):159-167.
- Gilbert, C.R. 1992. Bluenose shiner, *Pteronotropis welaka*. Pages 188-193 in, Gilbert, C.R. (ed.). Rare and endangered biota of Florida. Volume II. Fishes. University Press of Florida, Gainesville, Florida.
- Hoehn, T. 1998. Rare and imperiled fish species of Florida: a watershed perspective. Florida Game and Fresh Water Fish Commission, Tallahassee, Florida. 60 p.
- Johnson, C.E., and C.L. Knight. 1999. Life-history of the bluenose shiner, *Pteronotropis welaka* (Cypriniformes: Cyprinidae). *Copeia* 1999(1):200-205.
- Northwest Florida Water Management District. 2008. 2008 Water Supply Assessment Update. Water Resources Assessment 08-02. Havana, Florida. 138 p.
- Oysprey Data International, Inc. 2001. Natural History of the Bluenose Shiner (*Pteronotropis welaka*) and the Flagfin Shiner (*Pteronotropis signipinnis*). NonGame Wildlife Contract 99051 Final report. Florida Fish and Wildlife Conservation Commission, Tallahassee, Florida. 54p.
- Zwick, P.D. and M.H. Carr. 2006. Florida 2060, a population distribution scenario for the State of Florida. Prepared for the 1000 Friends of Florida by the Geoplan Center, University of Florida, Gainesville, Florida. 29 p.

Biological Status Review Information Findings		Species/taxon:	bluenose shiner		
		Date:	11/18/10		
		Assessors:	Burkhead, Tate, Hoehn		
		Generation length:	10 year (1-2 years life expectancy)		
Criterion/Listing Measure	Data/Information	Data Type*	Criterion Met?	References	
*Data Types - observed (O), estimated (E), inferred (I), suspected (S), or projected (P). Criterion met - yes (Y) or no (N).					
(A) Population Size Reduction, ANY of					
(A)1. An observed, estimated, inferred or suspected population size reduction of at least 50% over the last 10 years or 3 generations, whichever is longer, where the causes of the reduction are clearly reversible and understood and ceased ¹	data not available		N		
(A)2. An observed, estimated, inferred or suspected population size reduction of at least 30% over the last 10 years or 3 generations, whichever is longer, where the reduction or its causes may not have ceased or may not be understood or may not be reversible ¹	data not available		N		
(A)3. A population size reduction of at least 30% projected or suspected to be met within the next 10 years or 3 generations, whichever is longer (up to a maximum of 100 years) ¹	data not available		N		
(A)4. An observed, estimated, inferred, projected or suspected population size reduction of at least 30% over any 10 year or 3 generation period, whichever is longer (up to a maximum of 100 years in the future), where the time period must include both the past and the future, and where the reduction or its causes may not have ceased or may not be understood or may not be reversible. ¹	data not available		N		
¹ based on (and specifying) any of the following: (a) direct observation; (b) an index of abundance appropriate to the taxon; (c) a decline in area of occupancy, extent of occurrence and/or quality of habitat; (d) actual or potential levels of exploitation; (e) the effects of introduced taxa, hybridization, pathogens, pollutants, competitors or parasites.					
(B) Geographic Range, EITHER					
(B)1. Extent of occurrence < 20,000 km ² (7,722 mi ²) OR					

(B)2. Area of occupancy < 2,000 km ² (772 mi ²)	Based upon NHD (GIS-stream dataset) and HUC12 (watersheds) where species have been collected since 1980, ~2300 stream km (1423 stream miles) of ALL streams in HUC12s (excludes lower Choctawhatchee River). If you use a 0.4 km or .25 mile stream width assumption, then 920 stream km ² or 355.75 stream mi ² . Not all of area is habitat for the species.	S	Y	Osprey 2001, Bass et al. 2004, Gilbert 1992, FWC Data
AND at least 2 of the following:				
a. Severely fragmented or exist in ≤ 10 locations	occurs in 24 HUC12 units (13 HUC12 “combined units”)	O	N	Osprey 2001, Bass et al. 2004, Gilbert 1992, FWC Data
b. Continuing decline, observed, inferred or projected in any of the following: (i) extent of occurrence; (ii) area of occupancy; (iii) area, extent, and/or quality of habitat; (iv) number of locations or subpopulations; (v) number of mature individuals	variation in number of specimens collected over the past 25 years, change in extent of occurrence - St. Johns pop. has not been seen in 15 years	O	Y	Osprey 2001, Bass et al 2004, Gilbert 1992
c. Extreme fluctuations in any of the following: (i) extent of occurrence; (ii) area of occupancy; (iii) number of locations or subpopulations; (iv) number of mature individuals	number of mature individuals may be associated with climate (high water periods)	O	Y	FWC data unpublished (John Knight)
(C) Population Size and Trend				
Population size estimate to number fewer than 10,000 mature individuals AND EITHER	no data to substantiate estimates	S	N	
(C)1. An estimated continuing decline of at least 10% in 10 years or 3 generations, whichever is longer (up to a maximum of 100 years in the future) OR				
(C)2. A continuing decline, observed, projected, or inferred in numbers of mature individuals AND at least one of the following:				
a. Population structure in the form of EITHER				
(i) No subpopulation estimated to contain more than 1000 mature individuals; OR				
(ii) All mature individuals are in one subpopulation				
b. Extreme fluctuations in number of mature individuals				
(D) Population Very Small or Restricted, EITHER				
(D)1. Population estimated to number fewer than 1,000 mature individuals; OR	no data to substantiate estimates	O	N	Osprey 2001, Bass et al 2004, Gilbert 1992, FWC Data

(D)2. Population with a very restricted area of occupancy (typically less than 20 km ² [8 mi ²]) or number of locations (typically 5 or fewer) such that it is prone to the effects of human activities or stochastic events within a short time period in an uncertain future	greater area of occupancy and greater than 5 locations (occurs in 24 HUC12 units (13 HUC12 “combined units”))	O	N	Osprey 2001, Bass et al 2004, Gilbert 1992, FWC Data
(E) Quantitative Analyses				
(E)1. Showing the probability of extinction in the wild is at least 10% within 100 years			N	
Initial Finding (Meets at least one of the criteria OR Does not meet any of the criteria)	Reason (which criteria are met)			
Yes	B2 b & c			
Is species/taxon endemic to Florida? (Y/N)	no			
If Yes, your initial finding is your final finding. Copy the initial finding and reason to the final finding space below. If No, complete the regional assessment sheet and copy the final finding from that sheet to the space below.				
Final Finding (Meets at least one of the criteria OR Does not meet any of the criteria)	Reason (which criteria are met)			
Yes	B2 b & c			

1	<p align="center">Biological Status Review Information Regional Assessment</p>	Species/taxon:	bluenose shiner
2		Date:	11/18/10
3		Assessors:	Burkhead, Tate, Hoehn
4			
5			
6			
7			
8	Initial finding		
9			
10	2a. Is the species/taxon a non-breeding visitor? (Y/N/DK). If 2a is YES, go to line 18. If 2a is NO or DO NOT KNOW, go to line 11.		No
11	2b. Does the Florida population experience any significant immigration of propagules capable of reproducing in Florida? (Y/N/DK). If 2b is YES, go to line 12. If 2b is NO or DO NOT KNOW, go to line 17.		No
12	2c. Is the immigration expected to decrease? (Y/N/DK). If 2c is YES or DO NOT KNOW, go to line 13. If 2c is NO go to line 16.		
13	2d. Is the regional population a sink? (Y/N/DK). If 2d is YES, go to line 14. If 2d is NO or DO NOT KNOW, go to line 15.		
14	If 2d is YES - Upgrade from initial finding (more imperiled)		
15	If 2d is NO or DO NOT KNOW - No change from initial finding		
16	If 2c is NO or DO NOT KNOW - Downgrade from initial finding (less imperiled)		
17	If 2b is NO or DO NOT KNOW - No change from initial finding		No Change
18	2e. Are the conditions outside Florida deteriorating? (Y/N/DK). If 2e is YES or DO NOT KNOW, go to line 24. If 2e is NO go to line 19.		
19	2f. Are the conditions within Florida deteriorating? (Y/N/DK). If 2f is YES or DO NOT KNOW, go to line 23. If 2f is NO, go to line 20.		
20	2g. Can the breeding population rescue the Florida population should it decline? (Y/N/DK). If 2g is YES, go to line 21. If 2g is NO or DO NOT KNOW, go to line 22.		
21	If 2g is YES - Downgrade from initial finding (less imperiled)		
22	If 2g is NO or DO NOT KNOW - No change from initial finding		
23	If 2f is YES or DO NOT KNOW - No change from initial finding		
24	If 2e is YES or DO NOT KNOW - No change from initial finding		
25			
26	Final finding		No Change

Additional information –

The BRG found there was insufficient information to determine if there has been or will be a population size reduction (Criterion A) or if Criterion C (Population Size and Trend) was met, and there had been no specific population viability analysis developed (Criterion E). The BSG agreed Criterion B.2. was met with an estimated area of occupancy of 920 stream km² or 355.75 stream mi², based on a combination of the National Hydrographic Dataset (NHD) (GIS dataset of stream lines and waterbodies) and Hydrologic Unit Code (HUC)12 (watersheds), where the species has been collected since 1980. There are 24 HUC12 units where the species has been collected. Combining contiguous units results in 13 HUC12 units or locations, which exceeds Criterion B.2.a. The BRG concluded Criterion B.2.b. was met as a result of a change in extent of occurrence based on the variation in number of specimens collected over the past 25 years and the fact that the St. Johns population has not been observed in 15 years. The BSG believed that Criterion B.2.c. was met because the number of mature individuals may be associated with climate (high water periods) based upon collection records.

The Biological Review Group (BRG) discussed that the St. John's population may be unique, but has not been observed in many years. Additional sampling needs to be conducted in the St. Johns River. We also discussed the sampling that has occurred in the past 30 years and the trends that have been observed in both number of specimens and locations (Criterion B.2.b. and c.). We discussed that the "locations" (Criterion B.2.) were probably the individual HUC12 units since the fish do not move extended distances. There are 24 HUC12 units where the species has been collected. However, combining contiguous HUC12 units results in 13 "units" or locations (Criterion B.2.a.). John Knight indicated that he had collected hundreds on Holmes Creek this spring (2010) after a good high water period (Criterion B.2.c.). We also discussed that the St. Johns population had shown a long decline over the past 30 years. We discussed that the area of occupancy was going to be an over estimate since the species will not occupy all the streams that are included in the "clip" of the NHD stream segments. Further, the species would not occupy the entire estimated stream length due to specific habitat requirements.

APPENDIX 1. Biographies of the members of the Bluenose Shiner Biological Review Group.

Noel Burkhead (USGS)

Noel Burkhead has a B.S. from Roanoke College and an M.S. in zoology from the University of Tennessee. He is the Endangered Species Committee Chairman for the American Fisheries Society and has served decades as a Research Fishery Biologist for the US Fish and Wildlife Service and more recently for the US Geological Survey. Noel has an extensive publication record and is presently describing four new species of darters endemic to Georgia and Tennessee. His recent work has focused on assessing distribution and relative abundance of imperiled and endangered fishes in southern watersheds as a means of estimating extinction rates and determining their causes for many imperiled southern fishes. His expertise has resulted in his work with the International Union for the Conservation of Nature and Natural Resources, World Wildlife Fund, NatureServe, Center for Biological Diversity, and the Nature Conservancy.

Ted Hoehn (FWC/HCSS, Lead-shiners, saltmarsh topminnow),

Ted Hoehn, is a current employee of the Fish and Wildlife Conservation Commission with long experience in mapping the distribution of Florida fishes. He initiated the Florida's Aquatic Species and Habitat Conservation Planning (Aquatic GAP) Project. His distribution maps were derived from collections by the Commission, other agencies, and academic institutions throughout the country. His freshwater fish distribution data are the most comprehensive in the state. He has also long been involved with ecological and environmental issues, especially those related to the state's major river, the Apalachicola. Ted received his Masters in Biology (Marine emphasis) from Florida State University in 1983.

Bill Tate (USFWS)

Bill Tate is the US Fish and Wildlife Service biologist responsible for assisting Eglin Air Force Base's Jackson Guard unit in protecting the endangered Okaloosa darter. Through their efforts and his guidance this darter species has been managed successfully enough for the last decade that it qualified for down-listing from federally endangered to threatened this year. His expertise extends to all North Florida darters and many other benthic (therefore cryptic) freshwater species.

APPENDIX 2. Summary of letters and emails received during the solicitation of information from the public period of September 17, 2010 through November 1, 2010.

No information about this species was received during the public information request period.

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APPENDIX 3. Information and comments received from independent reviewers.
To be added later.

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