Bluenose Shiner

Pteronotropis welaka

Photograph by Howard L. Jelks, U.S. Geological Survey.

Species Overview

Status: Listed as state Threatened on Florida's Endangered and Threatened Species List.

Current Protections

- 68A-27.003(2)(a), F.A.C. No person shall take, possess, or sell any threatened species included in this subsection or parts thereof or their nests or eggs except as authorized by Commission rule or by permit from the Commission or when such conduct is authorized in a management plan as defined in this chapter and approved by the Commission, or as authorized in Commission-approved guidelines.
- 68A-27.001(4), F.A.C. Take – to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in such conduct. The term "harm" in the definition of take means an act which actually kills or injures fish or wildlife. Such act may include significant habitat modification or degradation where it actually kills or injures wildlife by significantly impairing essential behavioral patterns, including breeding, feeding or sheltering. The term "harass" in the definition of take means an intentional or negligent act or omission which creates the likelihood of injury to wildlife by annoying it to such an extent as to significantly disrupt normal behavioral patterns which include, but are not limited to, breeding, feeding or sheltering.

Biological Background

This section describes the biological background for this species and provides context for the following sections. It focuses on the habitats that support essential behaviors for the bluenose shiner, threats faced by the species, and what constitutes significant disruption of essential behaviors.

The bluenose shiner is a small- to medium-sized shiner measuring 33 to 51 mm (1.3 to 2.0 in); the maximum standard length for males is 51 mm (2 in) and 48 mm (1.9 in) for females (Johnston and Knight 1999). The species is olive-colored with a dark lateral stripe bordered above by a narrow amber stripe, a dark caudal spot highlighted by light-colored areas above and below, and a blue "nose" (visible in adults and only faintly visible in females). Breeding males have a bright blue snout, and have large, darkly pigmented dorsal fins and yellow pelvic and anal fins streaked with black (Hipes et al. 2000, Robins et al. 2018).

The bluenose shiner's average longevity is estimated to be about two years. They are reproductively active from May to September and may have two reproductive periods within this timeframe. Females may produce 55 to 190 eggs per reproductive event (Osprey Data International, Inc. 2001; Johnston and Knight 1999). This species has been observed spawning over the nests of longear sunfish (*Lepomis megalotis*), thus benefiting from the aggressive nest-guarding by male sunfishes. In the absence of *Lepomis* species, bluenose shiners are likely epibenthic broadcasters (spawning over a large area of the bottom), probably over sand, woody debris, and macrophytes (Burkhead 2010). Diet analysis has found that they feed on microscopic aquatic species of insects and rotifers (Osprey Data International, Inc. 2001).

The bluenose shiner is found in southern coastal plain streams from Florida to Louisiana. Occurrence throughout its range is highly fragmented (Albanese et al. 2007). In Florida, there are two disjunct distributions, the St. Johns River basin and the western panhandle, with no known occurrences between the St. Johns and the Apalachicola rivers (Gilbert 1992, Bass and Hoehn 2007, Robins et al. 2018). The population

in the western panhandle of Florida occurs in the Escambia, Yellow/Shoal, Choctawhatchee/Holmes Creek, and upper Chipola (Apalachicola) rivers; an eastern population in Florida occurs on the Atlantic slope in the middle St. Johns and Wekiva river drainages (FWC 2013). Detailed maps of bluenose shiner occurrence locations can be found in A Species Action Plan for the Bluenose Shiner (FWC 2013). Bluenose shiners in the St. Johns River are understood to be genetically divergent from the western population of the species (Austin and Hargrove 2015).

Habitat Features that Support Essential Behavioral Patterns

In Florida, bluenose shiners have been reported from a variety of disjunct habitats ranging from backwaters and river swamps to spring-run streams, deep pools, and holes, and occur in clear to turbid waters. Additionally, they have been found in both densely and minimally vegetated areas (Gilbert 1992, Osprey Data International, Inc. 2001).

Threats

The disjunct population centers of bluenose shiners in Florida, coupled with isolated occupied habitats and large fluctuations in population numbers, all combine to increase the susceptibility of the species to single catastrophic or cumulative localized events (FWC 2011). Primary threats to this species include changes in water quality and quantity, river impoundments for water supply, channel dredging, habitat alteration, introduction of non-native invasive species, and point and nonpoint source pollution (FWC 2013).

While some of the sub-watersheds occupied by bluenose shiners are protected by the Florida Department of Environmental Protection (DEP) as Outstanding Florida Waters (OFW), many additional occupied sub-watersheds are below water quality standards set by DEP due to elevated nutrients (Hoehn 1998). The Wekiva, Yellow, Shoal, and Escambia River basins, which are known to be occupied by bluenose shiners, are expected to experience an increase in development pressures over the next 50 years (Zwick and Carr 2006). Increasing residential development in these basins may result in increased nutrients and turbidity, changes to other water quality parameters, habitat loss, or increased consumptive use of water (Hoehn 1998). Grazing of aquatic vegetation by non-native apple snails, which reduces overall habitat quality, may contribute to vegetation reduction. Non-native vegetation may not prove suitable for continued bluenose shiner occupancy and may also contribute to reduced habitat quality.

Habitat fragmentation resulting from anthropogenic activities such as channelization and the construction of dams and roads also poses a threat to bluenose shiners. These activities prevent movement of individuals between sub-populations. The population of bluenose shiners in the panhandle of Florida also potentially faces threats from the creation of water reservoirs in the future (NWFWMD 2008). Reservoirs can cause changes in both water quality and connectivity in addition to loss of habitat. Population fragmentation due to the damming of free-flowing waters reduces genetic mixing and may result in loss of genetic fitness for bluenose shiner in Florida (Frankham 1996, Boschung and Mayden 2004).

Possession of bluenose shiners is prohibited without a permit; permits are issued for activities that further conservation or survival (see Scientific Collecting). However, the species may be maintained in captivity outside of Florida. While entry of captive bluenose shiners into Florida is prohibited, introduction of bluenose shiners bred for aquaculture outside of Florida into waterbodies where bluenose shiner naturally occur poses a potential genetic threat to wild populations. Selectively bred individuals may introduce traits into native populations that cause individuals to be maladapted to conditions in which they naturally exist.

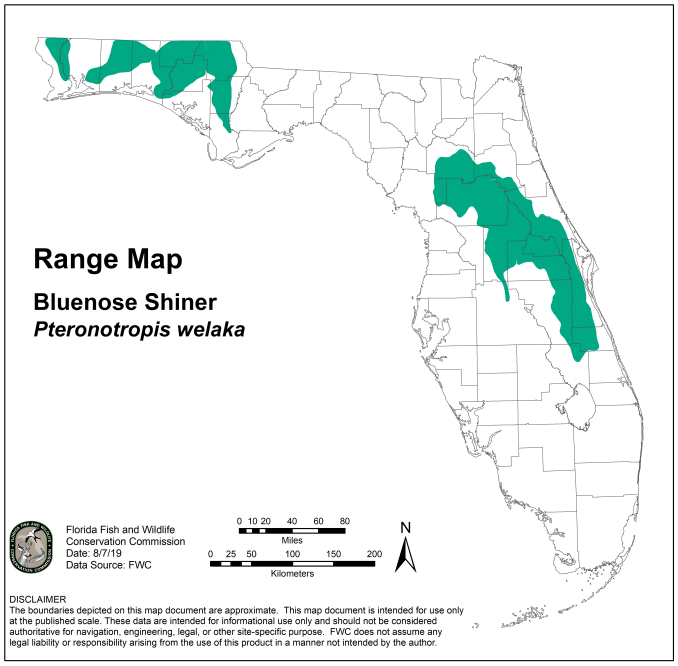
Potential to Significantly Impair Essential Behavioral Patterns

Little is known regarding the specifics of bluenose shiner life history, exact habitat requirements, and distribution, due to gaps in survey information and research. When present, they are generally found in low numbers, and have been known to disappear from locations at certain times of the year, as well as disappear for years before being re-detected at a locality (Osprey Data International, Inc. 2001; Bass et al. 2004).

Changes in land use adjacent to occupied streams can affect the water quantity, quality, temperature, cover, substrate and other environmental conditions of naturally flowing streams on which bluenose shiners depend. Increased runoff can discharge harmful pollutants and sediments that can modify instream habitat characteristics essential for reproductive success and other behaviors of this species. Water withdrawals from aquifers that interact with surface waters can also modify instream habitat by affecting water chemistry and temperature, reducing the frequency, magnitude, and duration of the natural flow regime and potentially limiting the connectivity between stream segments (Annear et al. 2004). Dredging could result in significant structural changes in the available habitat as well as changes in flow regime resulting in loss of suitable varieties of habitats needed to allow for seasonal selection. Additionally, impoundments could lead to further fragmentation and destruction of suitable instream habitats.

Distribution and Survey Methodology

The range map (right) represents the principle geographic range of the bluenose shiner, including intervening areas of unoccupied habitat. This map is for informational purposes only and not for regulatory use.



Counties: Escambia, Santa Rosa, Okaloosa, Walton, Holmes, Washington, Bay, Jackson, Calhoun, Gulf, Liberty, Putnam, Marion, Lake, Levy, Alachua, Orange, Seminole, Brevard, Polk, Osceola, Indian River, Okeechobee, and Volusia.

Recommended Survey Methodology

Surveys can be used to determine if bluenose shiners are present in an area, however, lack of detection may be a result of life history characteristics rather than true absence of the species, and thus failure to detect bluenose shiners does not confirm the species is absent from an area (Bailey and Peterson 2001, Peoples and Frimpong 2011).

- Electroshocking is not an acceptable method due to the risk of very high mortality for the bluenose shiner.
- Seining surveys can be conducted during project planning by applicants that have a scientific collecting permit. Surveys should occur within 300 m (984 ft) upstream and downstream from potential impact areas.
- Visual surveys are not recommended as an effective means of detection but would not require a permit.
- If bluenose shiners are detected during surveys within a project area, the applicant should coordinate with FWC.
- Results of any surveys can supplement existing information if they are provided to FWC.

Recommended Conservation Practices

Recommended Conservation Practices are general measures that could benefit the species but are not required. No FWC permit is required to conduct these activities.

- Avoid activities that would degrade or alter streams, riparian zones and uplands adjacent to rivers known to be occupied by bluenose shiners. Maintaining a buffer of 100 to 200 m (328 to 656 ft) around riparian zones can benefit bluenose shiner and likely prevent impacts to most other listed species that occur in inhabited waterways (U.S. Fish and Wildlife Service [USFWS] 2001).
- Restore natural hydrology and vegetative structure of altered riverine habitats in occupied watersheds.
- Maintain adequate minimum flows and levels to ensure connectivity between mainstream and backwater habitats and consistency with state-mandated Minimum Flows and Levels.
- Provide adequate buffers (75 to 100 m) between septic systems and riparian habitat.
- Locate, design and operate stormwater management systems to provide the maximum treatment for any potential input into riparian habitat in occupied waterways following performance standards and BMPs for stormwater management in occupied watersheds.

Measures to Avoid Take

Avoidance Measures that Eliminate the Need for FWC Incidental Take Permitting

This section describes all measures that would avoid the need for an applicant to apply for an FWC take permit.

- Bridge or culvert work that follows standard road construction best management practices and does not have a major instream impact.
- Upland activities that have no connection to waterbodies and do not cause runoff, or riparian conversion.
- Activates in riparian zones that include a 61 m (200 ft) buffer on both sides of Outstanding Florida Waters (Florida Department of Agricultural and Consumer Services [FDACS] 2008, DEP 2011).

Examples of Activities Not Expected to Cause Take

This list is not an exhaustive list of exempt actions. Please contact the FWC if you are concerned that you could potentially cause take.

- Activities that occur on impacted land not adjacent to bluenose shiner habitat.
- Silvicultural activities that follow the Florida Forestry Wildlife BMPs and Florida Agricultural Wildlife BMPs for streamside management zones.
- Routine vegetation maintenance in utility right of ways where such maintenance does not impact water quality of adjacent bluenose shiner habitat.

Florida Forestry Wildlife BMP's and Florida Agricultural Wildlife BMP's

- Agriculture, as defined in Section 570.02, F.S., conducted in accordance with Chapter 5I-8, F.A.C., and the wildlife best management practices (BMPs) adopted in Rule 5I-8.001 and 5M-18.001, F.A.C., by the Department of Agriculture and Consumer Service pursuant to Section 570.94, F.S., is authorized and does not require a permit authorizing incidental take despite any other provision of Rule 68A-27.007 or 68A-27.005, F.A.C.
- Participation in the Florida Forestry Wildlife BMPs and Florida Agricultural Wildlife BMPs program and implementation of these BMPs provides a presumption of compliance for incidental take of bluenose shiners.

Other Authorizations for Take

- As described in Rule 68A-27.007(2)(c), F.A.C., land management activities (e.g., wetland restoration, prescribed fire, mechanical removal of invasive species) that benefit wild-life and are not inconsistent with FWC Management Plans are authorized and do not require a permit authorizing incidental take.
- Vegetation removal or trimming in the linear right of way for power restoration. This applies only in cases where there is an immediate danger to the public's health and/or safety (including imminent

or existing power outages that threaten public safety, or in direct response to an official declaration of a state of emergency by the Governor of Florida or a local government entity), and only to non-routine removal or trimming of vegetation within the linear right of way, in accordance with a vegetation management plan that meets applicable federal and state standards. If conducted under these circumstances, no FWC take permit is required.

- Emergency actions necessary for human health and safety, such as water management activities for flood control.

Coordination with Other State and Federal Agencies

The FWC participates in other state and federal regulatory programs as a review agency. During review, FWC identifies and recommends measures to address fish and wildlife resources to be incorporated into other agencies' regulatory processes. FWC provides recommendations for addressing potential impacts to state listed species in permits issued by other agencies. If permits issued by other agencies adequately address all of the requirements for issuing a State-Threatened species take permit, the FWC will consider these regulatory processes to fulfill the requirements of Chapter 68A-27, F.A.C., with a minimal application process. This may be accomplished by issuing a concurrent take permit from the FWC, by a memorandum of understanding with the cooperating agency, or by a programmatic permit issued to another agency. These permits would be issued based on the understanding that implementation of project commitments will satisfy the requirements of Rule 68A-27.007, F.A.C.

Review of Land and Water Conversion projects with State-Listed Species Conditions for Avoidance, Minimization and Mitigation of Take

- FWC staff, in coordination with other state agencies, provide comments to federal agencies (e.g., the Army Corps of Engineers) on federal actions, such as projects initiated by a federal agency or permits being approved by a federal agency.
- FWC staff works with landowners, local jurisdictions, and state agencies such as the Department of Economic Opportunity on large-scale land use decisions, including long-term planning projects like sector plans, projects in Areas of Critical State Concern, and large-scale comprehensive plan amendments.
- FWC staff coordinates with state agencies such as the Department of Environmental Protection and the five Water Management Districts on the Environmental Resource Permitting (ERP) program, which regulates activities such as dredging and filling in wetlands, flood protection, stormwater management, site grading, building dams and reservoirs, waste facilities, power plant development, power and natural gas transmission projects, oil and natural gas drilling projects, port facility expansion projects, some navigational dredging projects, some docking facilities, and single-family developments such as for homes, boat ramps, and artificial reefs.
- Sector plans, developments of regional impacts, and county comprehensive plans are all reviewed currently and FWC provides conditions that would be beneficial to bluenose shiners.
- In areas with federally listed aquatic species, following the USFWS requirements is sufficient to protect bluenose shiners. In sector planning, a percentage of property must be set aside as conservation and focusing the set asides on riparian habitat will benefit the bluenose shiner.
- FWC staff, in coordination with the Department of Environmental Protection and the Northwest Florida and St. John's River Water Management Districts, will work together to protect flows in areas of known occurrence through the development of Minimum Flows and Levels for the rivers and streams.

FWC Permitting: Incidental Take

As defined in Rule 68A-27.001, F.A.C., incidental take is take that is incidental to, and not the purpose of,

carrying out an otherwise lawful activity. Activities that result in impacts to bluenose shiners can require an Incidental Take Permit from the FWC (see above for actions that do not require a permit). Permits may be issued when there is a scientific or conservation benefit to the species and only upon showing by the applicant that that the permitted activity will not have a negative impact on the survival potential of the species. Scientific benefit, conservation benefit, and negative impacts are evaluated by considering the factors listed in Rule 68A-27.007(2)(b), F.A.C. These conditions are usually accomplished through a combination of avoiding take when practicable, minimizing take that will occur, and mitigating for the permitted take. This section describes the minimization measures and mitigation options available as part of the Incidental Take Permit process for take of this species. This list is not an exhaustive list of options.

Minimization Measure Options

The options below are intended to address the evaluation factors required for consideration when issuing an incidental take permit. These options can lessen the impact of activities, and ultimately may reduce what is needed to achieve a conservation or scientific benefit.

Seasonal, Temporal, and Buffer Measures

- Upland activities that have the potential to disturb riparian zones should follow Outstanding Florida Waters recommendations and minimize activities within 61-91 m (200-300 ft) of the waterway (DEP 2011).

Design Modification

- If possible, avoid activities in priority sub-watersheds.
- Avoid activities that would impact/remove submerged aquatic vegetation.
- Site roads away from streams, outside the riparian buffer and the flood zone to the greatest extent possible.
- Site stormwater features outside of the buffer zone but situated so that any potential stormwater input is treated by the stormwater management system.
- Increase riparian buffers.
- When possible, use bridge culverts with open bottoms.
- Avoid underground storage tanks near the riparian buffer.

Method Modification

- Use sediment screens, bales, or other methods to limit sedimentation from upland site activity.
- Use turbidity screens instream to limit sedimentation within the river or waterbody.
- When creating waterway crossings, use top down bridge construction which can minimize impacts to bluenose shiners and other aquatic species. Specific project guidance can be obtained by contacting the Florida Department of Transportation.

Mitigation Options

Mitigation is scalable depending on the impact, with mitigation options for significant impairment or disruption of essential behavioral patterns constituting take. Potential options for mitigation are described below.

Scientific Benefit

This section describes research and monitoring activities that provide scientific benefit, per Rule 68A-27.007, F.A.C. Conducting or funding these activities can be the sole form of mitigation for a project.

- Sharing sightings data (live and dead observations) with FWC, including latitude and longitude and photographs when available.
- Following established survey methods, designing projects to fill data gaps related to life history information on the species. These projects should be conducted with input from FWC

Habitat

- Habitat acquisition may be a mitigation option.
- Targeting acquisition efforts on Pond Creek and other priority sub-watersheds in northwest Florida that are not already under Water Management District Ownership.
- Targeting in-holdings where bluenose shiners occur.

Funding

- No funding option has been identified at this time. However, funding options as part of mitigation will be considered on a case by case basis.

Information

- All data (negative and positive) from surveys should be provided by contacting FWC as specified in an incidental or intentional take permit, and can provide a benefit in addition to minimization options.

Programmatic Options

- No programmatic options are available for this species.

Multispecies Options

- Other species with overlap include federally listed mussels, Gulf sturgeon (*Acipenser oxyrhynchus desotoi*), Barbour's map turtle (*Graptemys barbourin*), Apalachicola alligator snapping turtle (*Macrochelys apalachicolae*), alligator snapping turtle (*Macrochelys temminckii*), and blackmouth shiner (*Notropis melanostomus*). Activities that benefit these species are likely to also benefit the bluenose shiner.

FWC Permitting: Intentional Take

Intentional take is not incidental to otherwise lawful activities. Per Rule 68A-27, F.A.C., intentional take is prohibited and requires a permit. For state-Threatened species, intentional take permits may only be considered for scientific or conservation purposes (defined as activities that further the conservation or survival of the species taken). Permits are issued for state-Threatened species following guidance in Rule 68A-27.007(2)(a), F.A.C.

Risks to Property or People

Intentional take for human safety

- There are no known circumstances for which bluenose shiners may be taken for human safety.

Aversive Conditioning

- Not applicable for the bluenose shiner.

Permits issued for Harassment

- Not applicable for the bluenose shiner.

Scientific Collecting and Conservation Permits

Scientific collecting permits may be issued for the bluenose shiner using guidance found in Rule 68A-27.007(2)(a), F.A.C. Activities requiring a permit include any research that involves capturing, handling, or marking wildlife; conducting biological sampling; or other research that may cause take. A scientific collecting permit should be obtained to use bluenose shiners for education and outreach.

Considerations for Issuing a Scientific Collecting Permit

1) Is the purpose adequate to justify removing the species (if the project requires this)?
    - Permits will be issued if the identified project is consistent with the goal of the Species Action Plan (i.e., improvement in status that leads to removal from Florida's Endangered and Threatened Species List) or addresses an data gap important to conservation of the species.

2) Is there a direct or indirect effect of issuing the permit on the wild population?
3) Will the permit conflict with program intended to enhance survival of species?
4) Will purpose of permit reduce likelihood of extinction?
- Projects consistent with the goal of the Species Action Plan or that fill identified data gaps in species life history or management may reduce the likelihood of extinction. Applications should clearly explain how the proposed research will provide a scientific or conservation purpose for the species.

5) Have the opinions or views of other scientists or other persons or organizations having expertise concerning the species been sought?
6) Is applicant expertise sufficient?
- Applicants must have prior documented experience with this or similar species; applicants should have met all conditions of previously issued permits; and applicants should have a letter of reference that supports their ability to handle the species.

Relevant to all Scientific Collecting for Bluenose Shiners

- No more than 5 whole specimens must be provided to FWC's Fish and Wildlife Research Institute, 3 for genetic analysis and the remainder to be provided to the Florida Museum of Natural History located in Gainesville, Florida.
- Any mortality of bluenose shiners should be reported immediately to the FWC. The FWC will provide guidance on proper disposition of specimens.
- Geographical or visual data gathered must be provided to FWC in the specified format.
- A final report should be provided to the FWC in the format specified in the permit conditions.

Additional Information

Information on Economic Assessment of this guideline can be found at http://myfwc.com/wildlifehabitats/imperiled/management-plans/

Contact

For more species-specific information or related permitting questions, contact FWC at (850) 921-5990 or WildlifePermits@myfwc.com. For more regional information visit https://myfwc.com/contact/fwc-staff/.

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