

Harlequin Darter

Etheostoma histrio



Photograph by Dr. Lawrence Page.

Species Overview

Status: Removed from Florida's Endangered and Threatened Species List.

Current Protections

- 68A-1.004, F.A.C., Take – The term take shall include taking, attempting to take, pursuing, hunting, molesting, capturing, or killing any wildlife or freshwater fish, or their nests or eggs by any means whether or not such actions result in obtaining possession of such wildlife or freshwater fish or their nests or eggs.
- 68A-4.001, F.A.C., General Prohibitions and Requirement – Prohibits the take, transport, sale, and possession of wildlife.

Biological Background

This section describes the biological background for this species and provides context for the following sections.

They are small benthic fish, that are cryptic in nature and attain a maximum size of about 7 cm (2.7 in). They are easily distinguishable from other darters within their range by the presence of 2 large, dark brown or green spots on the caudal fin base, a tear drop-shaped spot below the eye, 6 to 7 dorsal saddles, and 7 to 11 dark brown mid-lateral blotches (Boschung and Mayden 2004, Page and Burr 2011).

It is presumed that harlequin darter spawning begins in February or March (Gilbert and Yerger 1992). Although little is known regarding spawning site selection, it has been hypothesized that sexually mature individuals move to deeper water of large streams and rivers to attach eggs to woody debris (Kuhajda and Warren 1989, Bass et al. 2004). Fecundity was estimated as 456 eggs/mature female (Kuhajda and Warren 1989). Sexual maturity is reached at 1 year, while maximum age is around 4 years (Kuhajda and Warren 1989, Boschung and Mayden 2004).

Harlequin darters are found in a variety of habitats, but typically the species occurs in medium to large streams with variable stream currents, and substratum categories ranging from mud to bedrock (Boschung and Mayden 2004). Surveys conducted in Illinois found harlequin darters exclusively on woody debris (root wads, logs and brush) that were secured in substrate and had an established invertebrate population (Henry et al. 2009). Regardless of habitat type, the species is always associated with detritus (sticks, logs, leaves, roots) (Boschung and Mayden 2004). Harlequin darter diet consists almost exclusively of larval insects, such as midges and black fly, caddis fly, and may fly larvae.

Threats

A Biological Status Review (BSR) found that the Harlequin darter did not meet the criteria for state listing in Florida (FWC 2017). However, because the statewide population is limited to one watershed (Escambia), there are threats that may affect the species in the future.

Habitat degradation is often considered the greatest threat to imperiled species (Wilcove et al. 1998). Certain land practices within the Escambia River watershed could negatively impact harlequin darter populations.

Specifically, land use practices that result in both increased sediment and nutrient loads in the streambed, alterations in the hydrologic regime, destruction of habitat, and changes in shoreline morphology are the primary stressors affecting imperiled aquatic taxa (Richter et al. 1997). Excessive sediment loads and high turbidity may decrease reproductive success of harlequin darters by reducing visual contact between spawning individuals and preventing eggs from attaching to hard substrates (Steinberg et al. 2000). In addition, harlequin darters are always associated with some form of detritus; and presumably forage and attach their eggs to stable, embedded instream material (Etnier and Starnes 1993, Boschung and Mayden 2004, Henry et al. 2009). Therefore, excessive snag removal within the Escambia River and tributaries could potentially negatively impact spawning success as well as fitness due to loss of foraging grounds (Bass et al. 2004, Henry et al. 2009).

Habitat fragmentation resulting from human-induced activities also poses a potential threat to harlequin darters by preventing movement of harlequin darters between sub-populations. Population fragmentation due to impounding of lotic waters may result in loss of genetic fitness for harlequin darters in Florida (Frankham 1996, Boschung and Mayden 2004). It was previously believed that the harlequin darter was found only within restricted sections of the Escambia River and its tributaries in Florida. With the increase in effort associated with standardized long-term monitoring (LTM) program within its range coupled with directed sampling efforts, harlequin darters are now known to have a much greater distribution throughout the Escambia watershed (Harriger and Knight 2017).

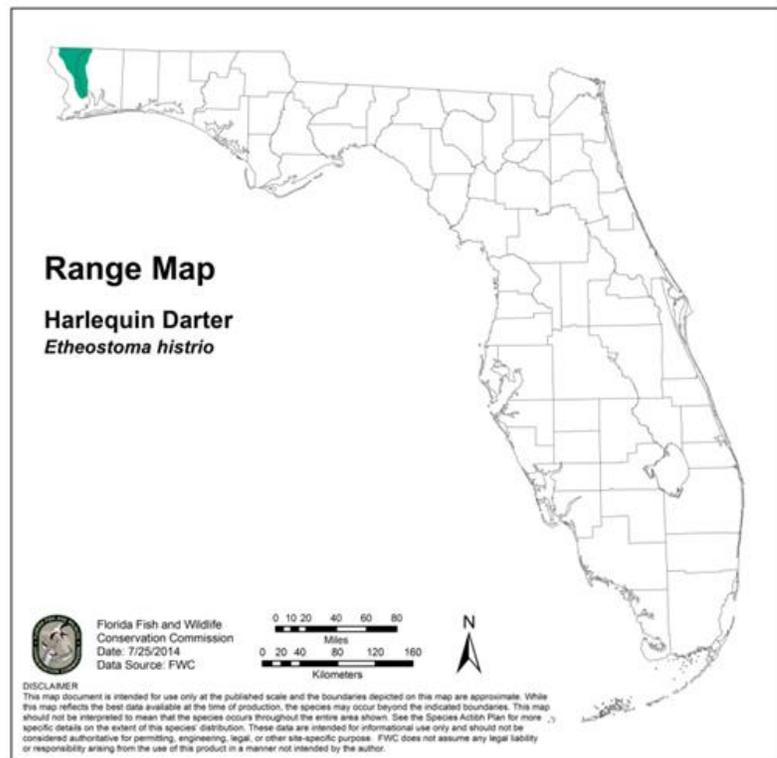
Distribution and Survey Methodology

The range map represents the principle geographic range of the harlequin darter, including intervening areas of unoccupied habitat. This map is for informational purposes only and not for regulatory use.

Counties: Santa Rosa and Escambia.

Recommended Survey Methodology

Surveys are not recommended for harlequin darters because of the limited range of this species. Snorkeling and electrofishing surveys targeting large woody debris and detritus can be conducted during project planning by applicants that have a scientific collecting permit ([see below](#)). Visual surveys are not recommended but would not require a permit.



Recommended Conservation Practices

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

- Minimize the removal of woody materials from stream channels in the Escambia watershed.
- Avoid activities that would degrade or alter streamside zones adjacent to areas inhabited by harlequin darters. Maintaining a minimum buffer of 50 m (164 ft) between the river or stream and upland activities would benefit the species, and a buffer of 100–200 m (328–656 ft) would 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 the Escambia watershed.
- Provide adequate buffers between septic systems and riparian habitat.
- Locate stormwater management systems to provide the maximum treatment for any potential input into riparian habitat in the Escambia watershed.

Prohibitions and Permitting

Harlequin darters are protected by the general prohibitions outlined in Rule 68A-4.001, F.A.C.: no wildlife or freshwater fish or their nests, eggs, young, homes, or dens shall be taken, transported, stored, served, bought, sold or possessed in any manner or quantity at any time except as specifically permitted by these rules nor shall anyone take, poison, store, buy, sell, possess or wantonly or willfully waste the same except as specifically permitted by these rules. Take is defined in Rule 68A-1.004, F.A.C., as pursuing, hunting, molesting, capturing, or killing (or attempting to do those things). A permit is required for any other activity that involves the possession, capture, sell, purchase, transport, hunting or killing of harlequin darters. These permits are issued for justifiable purposes as outlined in Rule 68A-9.002, F.A.C. Justifiable purposes are scientific, educational, exhibition, propagation, management or other justifiable purposes. Collection (taking) of nongame fish is controlled by rules of Chapter 68A-23, F.A.C., which specify devices and methods that may be used to take nongame fish by persons that possess a valid freshwater fishing license. There is no documented importance of harlequin darters to recreational anglers, although they may be taken as incidental catch during bait-collection activities, in rare circumstances. Rule 68A-23.003, F.A.C., governs persons fishing under a commercial fishing license. There are no known commercial fishing operations that result in the harvest of significant numbers of harlequin darters. There are no known recreational or commercial uses of harlequin darters.

No Permit Needed

The following activities could cause take, but are authorized in rule to be conducted without a permit:

- Silvicultural activities that follow the [Silvicultural BMPs for special management zones](#) (SMZ). (FDACS 2008, Florida Department of Environmental Protection [DEP] 2011).
- Bridge/culvert work that follows [road construction best management practices](#).
- 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 take despite any other provision of Rule 68A-27.005 or 68A-9.002, F.A.C.
- Participation in the [Florida Forestry Wildlife BMP's](#) and [Florida Agricultural Wildlife BMP's](#) program and implementation of these BMP's provides a presumption of compliance for take of harlequin darters.
- Unintentionally catching a harlequin darter and immediately releasing it back into the wild is authorized without a permit.

Permits for Justifiable Purposes - Scientific Collecting and Educational Use

Any survey methodology that requires handling, capturing, trapping, or taking a harlequin darter will require a scientific collecting permit. Scientific collecting permits for fish are issued under the authority of 68A-9.002, F.A.C.

- Individuals and institutions who desire to take or possess freshwater fish or their eggs for scientific, educational, propagation, exhibition or other justifiable purposes require a scientific collector's permit. Permits are issued based on the applicant's county and not on the collection locality. Applications are available online at <http://myfwc.com/license/freshwater/special-activities/>.
- The Florida Fish and Wildlife Conservation Commission's Division of Freshwater Fisheries Management issues special use permits for situations requiring exemptions from the Commission's rules not already covered by existing regulations. You can contact a [Regional Fisheries Administrator](#) for more information.

Other Permits

For any other justifiable purpose permit that does not fall under scientific collecting or educational use, please submit your request to WildlifePermits@myfwc.com.

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 the FWC at (850) 921-5990 or WildlifePermits@myfwc.com. For more regional information visit <http://myfwc.com/contact/fwc-staff/regional-offices>.

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