

May 20, 2020

MEMORANDUM

To: Industrial Economics, Incorporated (IEc)

From: Stephen Ricks, Field Supervisor, Ecological Services, Mississippi Field Office

Subject: Incremental Effects Memorandum for the Economic Analysis for the Proposed Rule to Designate Critical Habitat for the Pearl Darter

The purpose of this memorandum is to provide information to serve as a basis for conducting an economic analysis for the proposed designation of critical habitat for the pearl darter. Section 4(b)(2) of the Endangered Species Act (Act) requires the Secretary of Interior (Secretary), and therefore by delegation the U.S. Fish and Wildlife Service (Service), to consider the economic, national security, and other impacts of designating a particular area as critical habitat. The Secretary may exclude an area from critical habitat if the Secretary determines that the benefits of exclusion outweigh the benefits of including the area as critical habitat, unless the exclusion will result in the extinction of the species. In part to comply with section 4(b)(2) of the Act and consider the economic impacts of a proposed critical habitat designation, the Service prepares an economic analysis that describes and monetizes, where possible, the probable economic impacts of the proposed regulation. The data in the economic analysis may be used in the discretionary balancing evaluation under section 4(b)(2) of the Act to consider any particular area for exclusion from the final designation.

Determining the economic impacts of a critical habitat designation involves evaluating the “without critical habitat” baseline versus the “with critical habitat” scenario, to identify those effects expected to occur solely due to the designation of critical habitat and not from the protections that are in place due to the species being listed under the Act. Effects solely due to the critical habitat designation equal the difference, or increment, between these two scenarios, and include both (1) the effects of changes in the action to avoid destruction or adverse modification of critical habitat and (2) the costs of increased administrative efforts that result from the designation. These changes can be thought of as “changes in behavior” or the “incremental effect” that would most likely result from the designation if finalized. Specific measured differences between the baseline (without critical habitat) and the designated critical habitat (with critical habitat) may include, but are not limited to, the economic effects stemming from changes in land or resource use or extraction, changes in environmental quality, or time and effort expended on administrative and other activities by Federal landowners, Federal action

agencies, and in some instances, State and local governments or private third parties. These are the incremental effects that serve as the basis for the economic analysis.

There are a number of ways that designation of critical habitat could influence activities, but one of the important functions of this memorandum is to explain any differences between actions required to avoid jeopardy to the species versus actions that may be required to avoid destruction or adverse modification of critical habitat. The Service is analyzing whether destruction or adverse modification would occur based on whether the Federal agency's action is likely "to result in the destruction or adverse modification of habitat which is determined by the Secretary... to be critical." To perform this analysis, the Service considers how the proposed action is likely to affect the function of the critical habitat unit in serving its intended conservation role relative to the entire designation. The information provided below is intended to identify the possible differences for this species under the two different section 7 standards (i.e., jeopardy to the species and adverse modification of critical habitat). Ultimately, however, a determination of whether an activity may result in the destruction or adverse modification of critical habitat is based on the effects of the action to the designated critical habitat in its entirety. The information provided below is intended to identify the possible differences for the pearl darter under the different section 7 standards for jeopardy to the species and destruction or adverse modification of critical habitat.

The Service recognizes that the "geographical area occupied by the species" at the time of listing as stated under section 3(5)(A)(i) of the Act as the geographical area which may generally be delineated around the species' occurrences, as determined by the Secretary (i.e., range). Such areas may include those areas used throughout all or part of the species' life cycle, even if not used on a regular basis (e.g., migratory corridors, seasonal habitats, and habitats used periodically, but not solely by vagrant individuals). The species may or may not be present within all areas of the geographical area occupied by the species. Thus, the "geographical area occupied by the species" can, depending on the species at issue and the relevant data available, be defined on a relatively coarse scale.

Section 7 consultation is required whenever there is a discretionary Federal action that may affect listed species or designated critical habitat. Section 7(a)(3) also states that a Federal agency shall consult with the Secretary on any prospective agency action at the request of, and in cooperation with, the prospective permit or license applicant if the applicant has reason to believe that an endangered species or a threatened species may be present in the area affected by his project and that implementation of such action will likely affect such species. The initiation of section 7 consultation under the jeopardy standard takes place if the species may be present and the action is likely to affect the species.

Because of the relatively coarse scale of analysis allowed by the definition of "critical habitat," the species may or may not be present within all portions of the "geographical area occupied by the species" or may be present only periodically. Therefore, at the time of any consultation

under section 7 of the Act, the species of interest may not be present within the action area for the purposes of the section 7 consultation, even if that action area is within the “geographical area occupied by the species.” This possibility however, does not change the “geographical area occupied by the species” as stated under section 3(5)(A)(i) for the species. It must however, be reflected in our analysis of the economic impacts of a critical habitat designation. How we implement each critical habitat designation under section 7 is important because even when an area is determined to be within the general geographical area occupied by the species at the time of listing, the specific area where a consultation may occur is based on the presence of the species within the action area and the effects to that species. If a species is not present and the action is not likely to adversely affect the species within a particular area designated as critical habitat at the time of consultation, the economic effects of the consultation would likely be considered an incremental effect of the critical habitat because in almost all cases, the consultation would not have occurred absent the critical habitat designation¹. These incremental economic effects would derive both from changes in management, such as costs resulting from restrictions on development and other activities due solely to critical habitat, and changes in the scope of administrative review, i.e., the added costs of considering effects to critical habitat during consultation. (Additional administrative costs would also occur in *occupied* areas due to the need to analyze destruction or adverse modification of critical habitat along with jeopardy to the species.) In this memorandum, when we describe occupancy for purposes of estimating the probable incremental impacts and, therefore, potential economic costs of the critical habitat designation, we are referring to the occupancy status within the action area of a particular Federal action at the time of a consultation under section 7 of the Act. In this context, the “geographical area occupied by the species” under section 3(5)(A)(i) and the area where a species may be present or may be affected by a particular Federal action under a section 7 consultation may differ. The difference lies in the implementation of the critical habitat designation for purposes of the section 7 consultation, although within the geographical range occupied by the species under 3(5)(A)(i), the species may or may not be present at the time of consultation. The purpose of this memorandum is to describe how the Service will implement the critical habitat designation; however, it is only on a case by case basis that we are able to evaluate whether or not a Federal action may affect the listed species or its critical habitat while considering the species’ presence within the action area.

I. BACKGROUND

The pearl darter (*Percina aurora*) is a small fish (2 to 2.5 inches long) found in pools or deep runs of flowing streams and rivers. It is a benthic (bottom dwelling) species generally found over sand, gravel, or bedrock substrata in slow to moderate currents. This species was

¹ (If the area is not currently occupied and there is no critical habitat designated, it is unlikely that a Federal Agency would consult under section 7 in the first instance unless it is clear that activities in the unoccupied areas “may affect” nearby occupied areas.)

historically known from the Pearl River system of Mississippi and Louisiana, however, there have been no records of pearl darters from the Pearl River drainage in over 40 years and this population is now considered extirpated. Pearl darters continue to survive within 783 km (487 mi) of connected river and stream channels within the Pascagoula River drainage, including: 102 km (63 mi) of the Pascagoula River, 129 km (80 mi) of Big Black/Black Creek, 257 km (160 mi) of Chickasawhay River, 34 km (21 mi) of Chunky River, 192 km (119 mi) of Leaf River, 24 km (15 mi) of Bouie River, and 45 km (28mi) of Okatoma Creek. Recent survey efforts indicate stable populations in the Chickasawhay, Leaf, and Pascagoula rivers, and Okatoma Creek.

The pearl darter extirpation from the Pearl River system dates to the early 1970's, and has been linked to channel instability and upstream erosion caused by navigation development in the lower Pearl and construction of Ross Barnett Reservoir in the upper Pearl; sedimentation of channel habitats; construction of sills; general chronic water pollution; and, in-channel sand and gravel mining in the Bogue Chitto and middle Pearl Rivers.

Threats to the pearl darter surviving in the Pascagoula River drainage include geomorphic instability and associated channel erosion, degradation, and excessive sedimentation; and water quality degradation from point and non-point sources. Because of its limited distribution and small population size, the darter is also vulnerable to random threats such as spills and weather events (e.g., drought, floods). Despite existing authorities, such as the Clean Water Act, the implementation of water quality standards, and the development and use of Best Management Practices to mitigate various watershed and land management practices, geomorphic instability and pollutants continue to affect the darters habitats in some portions of the Pascagoula River drainage.

The proposed pearl darter critical habitat designation is based on all known historical and recent museum records for the species, reports of multiple annual fish collections from the Pearl River between 1950-1993, and more recent surveys for the pearl darter and other fish species. Based upon these sources, the last pearl darter collections from the Pearl River drainage were reported as: 1971, from the Pearl River and Bogue Chitto Creek, St. Tammany Parrish, Louisiana; 1968, Pearl River, Marion County, Mississippi; 1973, Pearl River, Lawrence County, Mississippi; and 1971, Strong River, Simpson County, Mississippi. Because the pearl darter disappeared from all Pearl River main channel and tributary channels within a 5 year span, it is not unreasonable to consider that an extinction event within the Pascagoula River drainage could follow a similar sequence. Therefore, we must consider the pearl darters currently surviving in various 2nd through 4th order streams within the Pascagoula drainage constitute a single population, and should be considered as a single critical habitat unit.

Consideration of the pearl darters within the Pascagoula drainage as a single population compounds the threats identified for the species. Reducing the degree of threat, as well as conservation of the species, will require restoring population redundancy through reintroduction of the pearl darter into the Pearl River drainage. A successful reintroduction will also increase pearl darter representation and resiliency.

The lower Strong River within the Pearl River drainage is currently unoccupied by the pearl darter, but it was historically known as a high quality spawning and recruitment site prior to the extirpation. We believe this channel reach has improved over the past few decades such that it currently provides all physical or biological features essential to the conservation of the pearl

darter, including bottom substrates of sand, gravel, bedrock, and woody debris; and a natural hydrograph with adequate flow and water quality to support all life stages of the darter and its prey. The presence of physical or biological features within this reach of the Strong River is also demonstrated by recent increases in other benthic fish populations (e.g., frecklebelly madtom) that experienced declines throughout the Pearl River drainage concurrent with the extirpation of the pearl darter.

The Strong River is the northern most (headwater) historical spawning site for the darter in the Pearl River drainage, and maintains connectivity with all historical downstream collection sites. Historical spawning and recruitment habitats in the Strong River are accessible and conducive to stocking and monitoring a rare fish species. This is particularly relevant in contrast to downstream reaches of the Pearl River with stronger flows, deeper channels, and widely dispersed habitats that are more difficult to consistently and accurately sample. Therefore, we are proposing to designate the lower Strong River as an unoccupied unit of critical habitat.

Designation Summary: We are proposing to designate approximately 832 km (517 mi) in two units as critical habitat for the pearl darter: (1) Pascagoula River Unit; and (2) Strong River Unit. Table 1 shows land ownership and approximate areas of the proposed designated areas for the pearl darter.

TABLE 1. Proposed critical habitat units for pearl darter.

[Unit length estimates include only stream channels within the ordinary high-water line.]

UNIT	LAND OWNERSHIP				Total km (mi)
	Federal km (mi)	State km (mi)	County km (mi)	Private km (mi)	
1 - Pascagoula River Drainage	72 (45)**	122 (76)**		600 (373)	783 (487)**
2 - Strong River			0.6 (0.4)	48.4 (30)	49 (30)
Total km (mi)	72 (45)**	122 (76)**	0.6 (0.4)	648.4 (403)	832 (517)**

**11 km (7 mi) Pearl Darter Critical Habitat stream miles shared between state and federal lands.

Unit 1: Pascagoula River Unit

Unit 1 consists of 783 km (487 mi) of connected river and stream channels within the Pascagoula River drainage, including:

102 km (63 mi) of the Pascagoula River channel from its confluence with the West Pascagoula River in Jackson County, upstream to the confluence of the Leaf and Chickasawhay Rivers, George County, MS;

129 km (80 mi) of Big Black/Black Creek channel from its confluence with the Pascagoula River in Jackson County, upstream to U.S. Highway 49 Bridge, Forrest County, MS;

257 km (160 mi) of Chickasawhay River channel from its confluence with the Leaf River just north of Enterprise, Clarke County, upstream to the confluence of Okatibbee Creek and the Chunky River, Clarke County, MS;

34 km (21 mi) of Chunky River channel from its confluence with Okatibbee Creek, Clarke County, upstream to second Highway 80 Crossing, Jasper County, MS;

192 km (119 mi) of Leaf River channel from its confluence with the Chickasawhay River, George County, upstream to the bridge crossing at U.S. Highway 84, Covington County, MS;

24 km (15 mi) of Bouie River channel from its confluence with the Leaf River, upstream to the confluence of Okatoma Creek, Forrest County, MS;

45 km (28 mi) of Okatoma Creek from its confluence with the Bouie River, Forrest County, upstream to the bridge crossing at U.S. Highway 84, Covington County, MS.

The riparian lands (channel borders) in this unit are generally privately owned agriculture or silviculture lands, with short reaches owned and managed by the U.S. Forest Service or the State (Table 1). There are also a few short reaches of stream bank owned and managed as conservation lands by The Nature Conservancy. All channel segments in Unit 1 are occupied by pearl darter and provide all physical or biological features essential to the conservation of the species, including deep pools, runs, and bends with scour holes, mixtures of bottom substrates of sand, silt, loose clay and gravel, fine and coarse particles of organic matter and snag material; a natural hydrograph with flows and water quality that currently support the normal life stages of the pearl darter, and the species' prey sources. Special management considerations and protections that may be required to address threats within the unit include: minimizing surface water withdrawals or other actions that alter stream hydrology; reducing the use of manures, fertilizers, and pesticides near stream channels; improving treatment of wastewater discharged from permitted facilities and the operation of those facilities; and implementing practices that protect or restore riparian buffer areas along stream corridors.

Unit 2: Strong River Unit

Unit 2 consists of 49 km (30 mi) of the Strong River channel from its confluence with the Pearl River, upstream to U.S. Highway 49, Simpson County, MS.

The riparian lands in this unit are generally privately owned agricultural or silviculture lands, with the west bank of a short channel reach owned and managed by the Simpson County Park Commission (Table 1). Unit 2 is currently unoccupied by the pearl darter, but was historically known to provide spawning and recruitment habitat prior to the species extirpation from the Pearl River drainage. We believe this channel reach currently provides all physical or biological features essential to the conservation of the pearl darter, including bottom substrates of sand, silt, loose clay, gravel, bedrock, fine and coarse particles of organic matter, and woody debris. There is a natural hydrograph with adequate flow and water quality to support all life stages of the darter and its prey. The presence of physical or biological features within this reach of the Strong River is also demonstrated by recent increases in other benthic fish species populations (e.g., frecklebelly madtom) that declined concurrent with the extirpation of the pearl. Special

management considerations and protections that may be required to address threats within the unit include: reducing the use of manures, fertilizers, and pesticides near stream channels; and implementing practices that protect or restore riparian buffer areas along stream corridors.

Re-establishing the pearl darter within this unit will increase population and habitat redundancy, restore ecological representation, and increase species resiliency by reducing its' vulnerability to random environmental and population effects. Accordingly, we have determined that this unit will contribute to the conservation of the pearl darter.

II. BASELINE ANALYSIS

In the following section we describe conservation efforts and protections that are part of the baseline; that is, those protections or efforts that currently exist and provide some level of conservation for the pearl darter. These activities will occur with or without critical habitat designation.

A. Identify Other Co-occurring Listed Species or Designated Critical Habitat That Overlap with the Pearl Darter's Proposed Critical Habitat

Table 2: Unit and Co-occurring Listed Species or Existing Critical Habitat

Unit	Co-occurring Listed Species or Existing Critical Habitat	Percent of Area	Incremental Conservation Efforts Recommended after Critical Habitat Designated	Major Changes?
1: Pascagoula River Unit	Total overlap	87%	None. Conservation measures to avoid impacts to the pearl darter will be the same to avoid impacts to habitat. Unit is also occupied by the yellow-blotched map turtle and Gulf sturgeon, both species with overlapping PBFs; 67% of habitat is currently Gulf sturgeon critical habitat.	No
	Gulf sturgeon (Threatened) critical habitat	79%		
		67%		
	yellow blotched map turtle (Threatened)	80%		
2: Strong River Unit	Gulf sturgeon	100 %	None. Unit is unoccupied by pearl darter, but occupied by the ringed map turtle and Gulf sturgeon; conservation measures to avoid impacts to these species will be the same to avoid impacts to pearl darter habitat.	No
	ringed map turtle (Threatened)	59%		

B. Identify Conservation Plans and Regulatory Mechanisms That Provide Protection to

the Species and Its Habitat Absent the Critical Habitat Designation

1. Conservation Plans/Efforts

There currently are no conservation plans or efforts designed specifically for the conservation of the pearl darter.

2. Federal Regulations/Acts

The following Federal laws and regulations provide some benefits to the pearl darter and are considered part of the baseline because these benefits will continue with or without critical habitat designation.

Endangered Species Act

The pearl darter was listed as a threatened species under the Act on September 20, 2017. Listing provides the opportunity for conservation and protection under sections 6, 7, 9, and 10 of the Act. These sections include cooperative actions with States (Section 6), consultation with Federal agencies for actions that may affect the species (Section 7(a)(2)); protection against take of the species ("take" means to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect or attempt to engage in any such conduct) (Section 9); cooperative actions with other entities and landowners for the purpose of scientific or enhancement of survival activities involving take (Section 10(a)(1)(A) permit); and lastly, habitat conservation planning under Section 10(a)(1)(B).

Clean Water Act

The Federal Water Pollution Control Act of 1977 (33 U.S.C. 1251 et seq.), commonly referred to as the Clean Water Act (CWA), establishes the basic structure for regulating discharges of pollutants into the waters of the United States and regulating quality standards for surface waters. Under the CWA, the U.S. Environmental Protection Agency (EPA) has implemented pollution control programs, such as setting wastewater standards for industry, and has set water quality standards for all contaminants in surface waters. Section 303d of the CWA requires each state to list its polluted water bodies and to set priorities for their clean up with a watershed restoration action plan called a "Total Maximum Daily Load" (TMDL) for each impaired water body. Section 404 of the CWA regulates the discharge of dredged or fill material into waters of the United States. Currently, waters of the United States have been defined to include tributaries to navigable waters (pearl darter river systems), interstate wetlands, wetlands which could affect interstate or foreign commerce, and wetlands adjacent to other waters of the United States.

Section 404 of the CWA requires parties to obtain a permit from the U.S. Army Corps of Engineers (Corps) prior to discharging dredge or fill material into "waters of the United States." Activities within the current range of the pearl darter that may require section 404 permitting include: land development; surface mining; transportation and utilities; and other actions involving dredging, impoundment, and channelization. As part of the section 404 permit processes, the Corps reviews the potential effects of the proposed action on ESA listed (and proposed) plant and animal species and critical habitat. The general conditions of department of the army permits typically require implementation of best management practices and other actions to minimize habitat impacts from sediment migration. When prudent, some department of the army permits also require project-specific conditions for avoidance and/or minimization of

adverse effects to specific habitats and individuals. As per the Mississippi slopes agreement, some actions to avoid/minimize adverse effects are included as project design criteria, and do not require project-specific permit conditioning.

Federal laws regarding oil and gas drilling (*Resource Conservation and Recovery Act (RCRA)* 42 U.S.C.6921 (2012) marginally protect freshwater resources like the pearl darter by requiring specific best management practices to reduce erosion and storm water runoff into waterways.

3. Federal Land Management

Within Unit 1, 50 km (32 mi) of Black Creek flows within the Desoto National Forest, 33 km (21 mi) of which is designated as a Wild and Scenic River managed for biodiversity. The remaining is managed for multiple use. There are no other federally managed lands included in the proposed designation of critical habitat for the pearl darter.

4. Tribal Regulations

There are no tribal lands included in the proposed designation of critical habitat for the pearl darter

5. State Laws that may provide protections/conservation

The pearl darter and its habitats are afforded some protection from water quality and habitat degradation under **Mississippi Water Pollution Control Law, as amended, 1993 (Code of Mississippi, §§ 49–17–1, et seq.)** and regulations promulgated there under by the Mississippi Commission on Environmental Quality. These laws and regulations mandate the protection of public health and welfare and the present use of waters for public water supplies, propagation of fish and aquatic life and wildlife, recreational purposes, and agricultural, industrial, and other legitimate uses. The adoption of water quality standards is the method of accomplishing the law's purpose. In order to achieve protection of the state's waters, the State of Mississippi maintains water-use classifications through issuance of National Pollutant Discharge Elimination System permits to industries, municipalities, and others that set maximum limits on certain pollutants or pollutant parameters. For water bodies on the Clean Water Act section 303(d) list, the State is required to establish a Total Maximum Daily Load (TMDL) as a benchmark for the pollutants of concern or lack of specific water quality parameters, such as dissolved oxygen, nitrates, turbidity, etc., that will improve water quality to the applicable standard.

Additionally, the Mississippi Department of Environmental Quality provides a guide for contractors and inspectors on installing, maintaining, and inspecting erosion and sediment control Best Management Practices (BMPs). There is also a *Storm Water Pollution Prevention Plan* (SWPPP) for NPDES (National Pollutant Discharge Elimination System) permits along with *The Erosion and Sediment Control and Stormwater Runoff Management Manuals* (2007), all suggesting techniques and methods to protect water quality.

The State of Mississippi classifies the pearl darter as endangered in the State and prohibits scientific collecting without a permit. However, the greater problem of habitat destruction and water quality degradation is not addressed by these designations; therefore, there is no direct protection from projects that would destroy or alter habitat conditions including water quality needed by the species. Public awareness of the species does increase voluntary use of best management practices to protect water quality.

The Mississippi Forestry Commission (MFC) requires specific streamside management zones (SMZ), based on the percent slope of the land during the course of silviculture activities for SFI Fiber Sourcing certification. The SFI Fiber Sourcing program promotes responsible forest management on timber suppliers' land that is environmentally accountable. It is based on a chain of custody certification to validate that the timber is from a grower that uses best management practices to reduce erosion and damage to the environment. The SMZ are buffers used to protect surface water quality down-stream of the silviculture operations. The MFC provides extensive outreach to forest owners on the use and importance of BMPs. A 2016 field survey by MFC indicated that BMPs were implemented at high rates across all silvicultural landscapes in Mississippi and effective at protecting water quality and in-stream habitats.

The Mississippi Surface Mining and Reclamation Law, Miss. Code Ann. § 53-7-1 *et seq.*, regarding oil and gas drilling marginally protect freshwater resources like the pearl darter by requiring specific best management practices to reduce erosion and storm water runoff into the waterways.

6. *Other*

Several short reaches within Unit 1 are afforded some protection from water quality degradation due to mandated use of BMPs within the Desoto National Forest (Black Creek), state-owned Pascagoula Wildlife Management Areas (WMA), Pascagoula Conservation Lands, and Ward Bayou WMA (Pascagoula River), and The Nature Conservancy's Deaton Nature Preserve (Leaf and Chickasawhay Rivers), and Murrah Nature Preserves (Pascagoula River).

C. Federal Agencies And Other Project Proponents That Are Likely To Consult With The Service Under Section 7 For The Listing Of The Subject Species Absent The Critical Habitat Designation

In the baseline scenario, section 7 of the Act requires Federal agencies to consult with the Service to ensure that any action authorized, funded, or carried out will not likely jeopardize the continued existence of the pearl darter. In addition to the pearl darter, there are currently two threatened species, Gulf sturgeon (*Acipenser oxyrinchus desotoi*) and yellow blotched map turtle (*Graptemys flavimaculata*), found in the Pascagoula River basin, both of which partially overlap the range of the proposed critical habitat which would require Federal agencies to consult with the Service under section 7 for proposed actions in the Basin. Approximately 67 percent of the proposed critical habitat in Unit 1 is currently designated critical habitat for Gulf Sturgeon.

The proposed critical habitat in Unit 2 is currently occupied by the threatened ringed map turtle (*Graptemys oculifera*), and may be seasonally occupied by Gulf sturgeon.

Federal agencies and projects that would likely be considered under the section 7 consultation processes with or without critical habitat include the following:

1. U.S. Army Corps of Engineers (Clean Water Act 404 permitting for bridge projects, stream restoration, development, removal of riparian vegetation, dredging, impoundment, snagging, docks and similar projects).

2. Federal Highway Administration (DOT highway and bridge construction and maintenance, railroad bridge construction and maintenance).
3. U.S. Forest Service (Forest Service Plans, riparian management).
4. U.S. Fish and Wildlife Service (intra-service consultations for issuance of section 10 permits for enhancement of survival, habitat conservation plans, and safe harbor agreements; Partners for Fish and Wildlife program projects benefitting pearl darters; Wildlife and Sportfish Restoration programs and traditional section 6 grants).
5. Federal Energy Regulatory Commission (Hydro Electric projects requiring licensing, natural gas and oil pipelines and associated petroleum related projects).
6. U.S. Environmental Protection Agency (discharge permits, pesticide permitting, Mississippi Department of Environmental Quality (MDEQ) water quality and Total Maximum Daily Load (TMDL) projects).
7. Natural Resources Conservation Service (Farm Bill programs).
8. Federal Emergency Management Agency (FEMA) (disaster cleanup activities).

1. Provide Examples Representing Typical Recommendations To Avoid Jeopardy.

The pearl darter was listed in 2017, and to date, there have been no formal consultations for the species. However, if we determine that an action jeopardizes the pearl darter in future section 7 consultations, recommended project modification to avoid, reduce or eliminate impacts (depending on the proposed action) may include seeking to reduce the size of the project footprint, modify the project design, or relocate project activities outside of areas that would cause impacts to the species.

2. What Types Of Project Modifications Might The Service Make During A Section 7 Consultation To Avoid Jeopardy.

Project modifications may include seeking to relocate project activities outside of occupied habitat or in close proximity of such areas to avoid river and stream disturbance in occupied areas. Other modifications may include reducing the amount of area impacted or requiring strict erosion control and pollution control methods that would be protective of habitat and water quality.

Specifically, recommendations for avoiding jeopardy include avoiding activities that cause physical habitat disturbance (i.e., reduction of flow, channel and bank erosion, sedimentation of substrates) or degradation of water quality in streams occupied by the species. Activities to be avoided include those that cause or result in channel blockage (e.g., construction of dams, placement of fill, dredging, channelization), excessive sedimentation (e.g., through bank and channel erosion or as runoff from roads or other disturbed sites), or polluted effluents or runoff (e.g., dissolved solids, animal waste, untreated domestic sewage).

For actions subject to consultation through a Federal nexus or action, a jeopardy analysis for the pearl darter would look at the magnitude of a project's impact relevant to the species' entire range. Furthermore, the jeopardy analysis would focus on effects to the species' reproduction, numbers, or distribution, including an analysis of habitat modifications that would limit the ability to move between populations, or hinder the expansion of the species for recovery.

III. ONCE CRITICAL HABITAT IS DESIGNATED, WILL THE OUTCOME OF SECTION 7 CONSULTATIONS IN OCCUPIED HABITAT BE DIFFERENT?

Unlikely. The Service does not anticipate differences in the outcome of section 7 consultations in occupied habitat because generally actions that affect habitat and its ability to function normally would typically also adversely affect the species. The pearl darter is a rare, channel darter and is difficult to survey. The species occurs in very low densities in larger rivers and creeks. Therefore, in occupied habitat, and when suitable habitat conditions exist, we will assume that the pearl darter is present.

IV. INCREMENTAL IMPACTS ANALYSIS

A. ADVERSE MODIFICATION ANALYSIS

Explain Additional Recommendations The Service Will Make When Considering Both Jeopardy And Adverse Modification.

Project modifications requested by the Service to avoid jeopardy to the species are the same as those likely to avoid adverse modification of critical habitat.

- 1. What Federal Agencies Or Project Proponents Are Likely To Consult With The Service Under Section 7 With Designation Of Critical Habitat? What Kinds Of Additional Activities Are Likely To Undergo Consultation With Critical Habitat?*

The same Federal agencies and project proponents that go through consultation without designation of critical habitat, as presented in Section II, C., above. No types of additional activities are likely to undergo consultation with critical habitat.

- 2. Provide Examples Representing Typical Recommendations to Avoid Adverse Modification Of Critical Habitat Applicable Across A Broad Suite Of Projects. Where Significant Uncertainty Exists, Provide Ranges Of Potential Outcomes.*

Examples of recommendations are described above under “Typical Recommendations to Avoid Jeopardy” as presented in Section II, C., above.

- 3. What Types Of Project Modifications Might The Service Make During A Section 7 Consultation To Avoid Destruction Or Adverse Modification Of Critical Habitat That Are Different Than Those For Avoiding Jeopardy?*

None; due to the close ties between the pearl darter survival and the quality of its habitat, any conservation efforts the Service requests to avoid adverse modification of critical habitat will most likely match those requested to avoid jeopardy. In most cases, the results of consultation under the adverse modification and jeopardy standards will be similar because the physical and biological features that define critical habitat are also essential for the survival of the species.

4. *If The Species is Only Seasonally Or Sporadically Present Would The Outcome Of The Consultation Be The Same If Present at Time of Section 7 Consultation?*

Yes. The pearl darter is a rare, channel darter and is difficult to collect. The species occurs in very low densities in larger rivers and creeks. Therefore, in occupied habitat, and when suitable habitat conditions exist, we will assume that the pearl darter is present.

5. *What Project Proponents Are Likely To Pursue HCPs Under Section 10 After The Designation Of Critical Habitat?*

None are known at this time.

B. UNOCCUPIED AREAS OR AREAS WHERE THE SPECIES IS NOT PRESENT

Does the designation include unoccupied habitat that was not previously subject to the requirements of section 7?

1. *Identify Unoccupied Units Or Subunits.*

Unit 2, Strong River, is being proposed as an unoccupied unit of critical habitat. The threatened ringed map turtle occupies a portion of this unit, and Gulf sturgeon may seasonally occur here; therefore, this unit is currently subject to the requirements of section 7 for these species.

2. *Provide Information About The Likelihood That Project Proponents Would Have Known About The Potential Presence Of The Species Absent Critical Habitat*

Most project proponents query state Natural Heritage databases and the Service's IPAC database to identify areas where species occur relative to proposed projects. These queries typically provide the historical occurrence data for project proponent's consideration.

3. *Describe Typical Project Modifications the Service Will Recommend When Considering Adverse Modification*

Project modifications in unoccupied critical habitat would be similar to those in occupied critical habitat.

4. *Provide Examples Representing Typical Recommendations Applicable Across A Broad Suite Of Projects. Where Significant Uncertainty Exists, Provide Ranges Of Potential Outcomes.*

Project modifications in unoccupied critical habitat would be similar to those in occupied critical habitat, focusing on maintaining and improving water and substrate quality.

C. BEHAVIOR CHANGES

Will the designation provide new information to stakeholders resulting in different behavior?

1. Describe Actions Taken By Stakeholders As A Result Of Critical Habitat.

We do not anticipate behavior changes as a result of the critical habitat designation.

2. Describe How Local Agencies Might Change Project Requirements.

We do not anticipate local agencies to change project requirements.

3. How Many New Consultations May Result From The Critical Habitat Alone?

We expect very few, if any, new consultations to result from the critical habitat designation alone. The unoccupied area of the Strong River is currently occupied by the threatened ringed map turtle and the Gulf Sturgeon.

4. How Many New HCPs May Be Undertaken Or Reinitiated As A Result Of The Critical Habitat Designation Alone?

We do not expect any new HCPs to be undertaken as a result of the critical habitat designation alone. There are no existing HCPs within the critical habitat.

5. Will There Be Changes In Permitting Processes By Other State Or Local Agencies Or Other Land Managers?

We do not expect any changes to the permitting processes by state or local agencies.

D. ADMINISTRATIVE EFFORTS

How Much Additional Administrative Effort Will Be Spent To Address Adverse Modification In Section 7 Consultations With Critical Habitat? Estimate The Difference Compared To Baseline.

In Unit 1, Pascagoula River, we anticipate little to no additional administrative effort with critical habitat, however, previous studies by Industrial Economics, Inc. have indicated that a range of 10 to 15 percent increase in administrative costs is generally expected when addressing adverse modification in addition to jeopardy in a consultation. The U.S. Forest Service in Mississippi does not anticipate conducting activities which are likely to adversely affect the pearl darter or its habitat in the Desoto National Forest, or any change in consultation frequency or outcomes (S. Williamson, Forest Planning Biologist, *in litt.*, response to request for information regarding the potential economic impacts associated with a proposal for critical habitat designation for the pearl darter (Federal Agency response), 2020). The Mobile District, U.S. Army Corps of Engineers, considers that the frequency of consultations for permits may increase slightly in the Pascagoula River drainage, depending on the identified primary constituent elements and activities that may affect designated critical habitat (M.N. Sahawneh, Regulatory, Mobile District, *in litt.*, Federal Agency response, 2020).

In Unit 2, Strong River, any Federal actions that may affect the river channel, flows, or quality are currently assessed for effects to the federally listed ringed map turtle and Gulf sturgeon. The Vicksburg District, U.S. Army Corps of Engineers, informed us that while the frequency of consultations for permits may increase in the Pearl River drainage basin if pearl darter critical habitat is designated, potential impacts to species and habitats are typically cost-effectively mitigated through permit BMP requirements following programmatic or informal consultation (J. Mallard, Regulatory Branch, Vicksburg District, *in litt.* Federal Agency response, 2020). This is supported by our review of Federal actions within the middle Pearl and Strong Rivers over the past decade. As in Unit 1, however, an administrative cost increase of 10 to 15 percent to address pearl darter critical habitat is generally expected.

E. PROBABLE PROJECTS

Though not an active project at this time, there has been a proposal to impound two tributaries to the Pascagoula River (Little and Big Cedar creeks) which would likely decrease water quantity entering into the lower Pascagoula Basin (Unit 1). We know of no probable Federal nexus projects in the Strong River (Unit 2). We routinely consult with the DOT on bridge and road construction and maintenance projects, and with the U.S. Corps of Engineers on projects requiring 404 permits within the Pascagoula River drainage, and may occasionally do so in the Strong River drainage.

1. Land Use Sectors Within The Critical Habitat Designation Area

Unit 1 (Pascagoula River): Agriculture, Conservation/Restoration, Development, Dredging, Forest Management, In-Water Construction, Oil and Gas, Recreation, Transportation, Water Quantity/Supply, Utilities.

Unit 2 (Strong River): Agriculture, Conservation/Restoration, Forest Management, Oil and Gas, Recreation, Transportation, Utilities.

2. Identify The Economic Activities That May Be Affected By the Designation of Critical Habitat

Conservation/Restoration, Development, Dredging, Flood Control, In-Water Construction, Oil and Gas, Transportation, Utilities, Water Quality, Water Quantity/Supply.

- *Is there a Federal nexus for each of these economic activities?*
We believe all in-channel activities would be subject to a Federal 404 permit. Many of the land-based activities would have no Federal nexus; however, some of the land-based activities may require a Federal permit (i.e. land development, oil and gas, transportation, utilities) and consultation.
- *Are there energy supply, distribution, or use sectors that are reasonably likely to be affected by this critical habitat designation?*

Major crude oil, product oil and natural gas pipelines are present in Unit 1. In addition, gas compressor stations, oil pumping stations and a refinery are adjacent to the critical habitat area. Oil and gas leases, and power lines could potentially cross either of the proposed critical habitat units. Portions of Unit 1 are within or close to gas or oil fields; Unit 2 is downstream from a gas field. None of these are expected to be affected by this critical habitat designation.

3. Consultation History Within The Critical Habitat Designation Area

Unit 1: Between 2006 and 2020 the Mississippi Ecological Services office completed or assisted in numerous technical assistance/informal consultations (approximately 2,200 in the Pascagoula River Basin, which includes the pearl darter's current range.

The majority were with the Corps of Engineers, Department of Housing and Urban Development, Federal Communications Commission, Federal Highway Administration, and Department of Agriculture. Projects requiring a section 404 permit included road construction, bridge repair or replacement, boat ramp repair or replacement, and commercial development projects. For these projects, and for similar projects with in-stream impacts, we generally recommended measures to avoid and minimize those impacts to aquatic resources including: installing erosion and sedimentation control devices; minimizing disturbance to the stream channel and riparian areas; constructing storm water retention basins; and following the Service's stream crossing guidance. Other consultations in the Pascagoula River Basin were completed with other agencies including the Federal Energy Regulatory Commission and the Federal Emergency Management Agency.

Unit 2: Between 2006 and 2020 the Mississippi Ecological Services office completed or assisted in numerous technical assistance/informal consultations (approximately 1,000) in the Middle Pearl Strong River Watershed. The majority were with the Corps of Engineers, Department of Housing and Urban Development, Federal Communications Commission, Federal Highway Administration, and Department of Agriculture. Projects requiring a section 404 permit included road construction, bridge repair or replacement, boat ramp repair or replacement, and commercial development projects. For these projects, and for similar projects with in-stream impacts, we generally recommended measures to avoid and minimize those impacts to aquatic resources including: installing erosion and sedimentation control devices; minimizing disturbance to the stream channel and riparian areas; constructing storm water retention basins; and following the Service's stream crossing guidance. Other consultations in the Strong River Basin were completed with other agencies including the Federal Energy Regulatory Commission and the Federal Emergency Management Agency.

IV. CONCLUSION

Because Unit 1 is currently occupied by the pearl darter, anticipated project modifications to avoid adverse modification to the pearl darter critical habitat will be similar to the management recommendations to avoid jeopardy. Thus, it is unlikely that we would determine that a project would result in adverse modification of critical habitat and not also jeopardy. Furthermore, the implementation of reasonable and prudent alternatives associated with avoidance of jeopardy of the species would also avoid adverse modification of the critical habitat. Unit 1 overlaps with occupied critical habitat for the threatened Gulf sturgeon, and overlaps with the threatened yellow blotched map turtle range. Habitats of both of these species share physical and biological

features required by the pearl darter. Therefore, we do not expect that the critical habitat designation will result in any additional consultations in this unit.

Unit 2 is currently unoccupied by the pearl darter, but overlaps with occupied range of the threatened Gulf sturgeon and threatened ringed map turtle. Habitats of both of these species share physical and biological features required by the pearl darter. Therefore, we do not expect that the critical habitat designation will result in any additional consultations in this unit.

In projects where we determine that an adverse modification finding may be likely, we will work with the Federal agency involved to identify reasonable and prudent alternatives that would eliminate or reduce those impacts to a point where adverse modification is no longer likely. The resulting project modifications would appropriately be considered to be incremental costs of the critical habitat designation.