**DEPARTMENT OF THE INTERIOR**

**Fish and Wildlife Service**

**50 CFR Part 17**

**[Docket No. FWS–R4–ES–2021–0097; FXES1111090FEDR–245–FF09E21000]**

**RIN 1018–BF42**

# Endangered and Threatened Wildlife and Plants; Threatened Species Status for Pearl River Map Turtle With Section 4(d) Rule; and Threatened Species Status for Alabama Map Turtle, Barbour's Map Turtle, Escambia Map Turtle, and Pascagoula Map Turtle Due to Similarity of Appearance With Section 4(d) Rule

**AGENCY:** Fish and Wildlife Service, Interior.

**ACTION:** Final rule.

**SUMMARY:** We, the U.S. Fish and Wildlife Service (Service), list the Pearl River map turtle (*Graptemys pearlensis*), a freshwater turtle species from the Pearl River drainage in Mississippi and Louisiana as a threatened species with 4(d) protective regulations under the Endangered Species Act of 1973 (Act), as amended. Due to similarity of appearance, we also list the Alabama map turtle (*Graptemys pulchra*), Barbour's map turtle (*Graptemys barbouri*), Escambia map turtle (*Graptemys ernsti*), and Pascagoula map turtle (*Graptemys gibbonsi*) as threatened species with 4(d) protective regulations under the Act. This rule adds these species to the List of Endangered and Threatened Wildlife.

**DATES:** This rule is effective August 12, 2024.

**ADDRESSES:** This final rule is available on the internet at *https://www.regulations.gov* under Docket No. FWS–R4–ES–2021–0097 and at the Service's Environmental Conservation Online System (ECOS) species page at *https://ecos.fws.gov/ecp/species/10895*. Comments and materials we received, as well as supporting documentation we used in preparing this rule (such as the species status assessment report), are available for public inspection at *https://www.regulations.gov* at Docket No. FWS–R4–ES–2021–0097.

**FOR FURTHER INFORMATION CONTACT:** James Austin, Field Supervisor, U.S. Fish and Wildlife Service, Mississippi Ecological Services Field Office, 6578 Dogwood View Parkway, Suite A, Jackson, MS 39213; telephone 601–321–1129. Individuals in the United States who are deaf, deafblind, hard of hearing, or have a speech disability may dial 711 (TTY, TDD, or TeleBraille) to access telecommunications relay services. Individuals outside the United States should use the relay services offered within their country to make international calls to the point-of-contact in the United States.

**SUPPLEMENTARY INFORMATION:**

## Executive Summary

*Why we need to publish a rule.* Under the Act (16 U.S.C. 1531 *et seq.*), a species warrants listing if it meets the definition of an endangered species (in danger of extinction throughout all or a significant portion of its range) or a threatened species (likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range). If we determine that a species warrants listing, we must list the species promptly and designate the species' critical habitat to the maximum extent prudent and determinable. We have determined that the Pearl River map turtle meets the Act's definition of a threatened species; therefore, we are listing it as such. In addition, due to similarity of appearance, we have determined threatened species status for the Alabama map turtle, Barbour's map turtle, Escambia map turtle, and Pascagoula map turtle. Listing a species as an endangered or threatened species can be completed only by issuing a rule through the Administrative Procedure Act rulemaking process (5 U.S.C. 551 *et seq.*).

*What this document does.* This rule lists the Pearl River map turtle as a threatened species with a rule issued under section 4(d) of the Act (a ''4(d) rule''). It also lists the Alabama map turtle, Barbour's map turtle, Escambia map turtle, and Pascagoula map turtle as threatened species based on their similarity of appearance to the Pearl River map turtle under section 4(e) of the Act with a 4(d) rule for these species.

In our November 23, 2021, proposed rule, we found critical habitat to be not prudent for the Pearl River map turtle because of the potential for an increase in poaching. However, we have reevaluated the prudency determination based on public comment and the already available information in the public domain that indicates where the species can be found. Consequently, we have determined that critical habitat is prudent but not determinable at this time for the species. We intend to publish a proposed rule designating critical habitat for the Pearl River map turtle in the near future.

*The basis for our action.* Under the Act, we may determine that a species is an endangered or threatened species because of any of five factors: (A) The present or threatened destruction, modification, or curtailment of its habitat or range; (B) overutilization for commercial, recreational, scientific, or educational purposes; (C) disease or predation; (D) the inadequacy of existing regulatory mechanisms; or (E) other natural or manmade factors affecting its continued existence. We have determined that the threats to the Pearl River map turtle include habitat degradation or loss (degraded water quality, channel and hydrologic modifications/impoundments, agricultural runoff, mining, and development—Factor A), collection (Factor B), and effects of climate change (increasing temperatures, drought, sea-level rise (SLR), hurricane regime changes, and increased seasonal precipitation—Factor E).

Section 4(a)(3) of the Act requires the Secretary of the Interior (Secretary), to the maximum extent prudent and determinable, concurrently with listing designate critical habitat for the species. We have not yet been able to obtain the necessary economic information needed to develop a proposed critical habitat designation for the Pearl River map turtle, although we are in the process of obtaining this information. At this time, we find that designation of critical habitat for the Pearl River map turtle is not determinable. When critical habitat is not determinable, the Act allows the Service an additional year to publish a critical habitat designation (16 U.S.C. 1533(b)(6)(C)(ii)).

## Previous Federal Actions

Please refer to the proposed listing rule (86 FR 66624; November 23, 2021) for a detailed description of previous Federal actions concerning the Pearl River map turtle, Alabama map turtle, Barbour's map turtle, Escambia map turtle, and Pascagoula map turtle.

## Peer Review

A species status assessment (SSA) team prepared an SSA report for the Pearl River map turtle (Service 2023, entire). The SSA team was composed of Service biologists, in consultation with other species experts. The SSA report represents a compilation of the best scientific and commercial data available concerning the status of the species, including the impacts of past, present, and future factors (both negative and beneficial) affecting the species.

In accordance with our joint policy on peer review published in the **Federal Register** on July 1, 1994 (59 FR 34270), and our August 22, 2016, memorandum updating and clarifying the role of peer review in listing actions under the Act,

we solicited independent scientific review of the information contained in the Pearl River map turtle SSA report, version 1.1 (Service 2021, entire). We sent the SSA report to five independent peer reviewers and received responses from all five reviewers; three substantive comments were provided by two peer reviewers. We notified Tribal nations early in the SSA process for the Pearl River map turtle. We sent the draft SSA report for review to the Mississippi Band of Choctaw Indians and received comments that were addressed in the SSA report. The peer reviews can be found at *https://www.regulations.gov* at Docket No. FWS–R4–ES–2021–0097 and at our Mississippi Ecological Services Field Office (see **FOR FURTHER INFORMATION CONTACT**). In preparing the proposed rule, we incorporated the results of these reviews, as appropriate, into the SSA report, which was the foundation for the proposed rule and this final rule. A summary of the peer review comments and our responses can be found in the Summary of Comments and Recommendations, below.

**Summary of Changes From the Proposed Rule**

After consideration of the comments we received during the November 23, 2021, proposed rule's comment period (refer to Summary of Comments and Recommendations, below), and new information published or obtained since the proposed rule was published, we updated the SSA report to include new information. The revised SSA report is available as version 1.2 (Service 2023, entire). In addition, in this final rule, we add information to the listing determination for the Pearl River map turtle and the associated 4(d) rule's exceptions to prohibitions. Many small, nonsubstantive changes and corrections, which do not affect the determination (*e.g.,* minor clarifications, correcting grammatical errors, etc.), are made throughout this document. Below is a summary of changes we make in this final rule.

(1) We update the citation for one literature source reporting on the status of the Pearl River and Pascagoula map turtles (Lindeman et al. 2020, entire) to reflect its recent publication in a peer-reviewed journal.

(2) We incorporate an additional citation (Refsnider et al. 2016, entire) to discuss how the potential for climate change-induced impacts to turtle hatchling sex ratios, a result of these turtles exhibiting temperature-dependent sex determination (TSD), may be mitigated by plasticity of TSD thermal sensitivity and the mother turtle's ability for nest-site selection.

(3) For the Pearl River map turtle's 4(d) rule, we do not include an exception from the incidental take prohibition resulting from construction, operation, and maintenance activities that occur near and in a stream. We determined that this exception is too vague and could have caused confusion regarding whether State or Federal regulatory processes apply to these activities. Many activities occurring near or in a stream require permits or project review by Federal or State agencies, and including this exception could have been interpreted as removing these requirements, which was not our intention. Therefore, we find that finalizing a 4(d) rule that included this exception to incidental take is not necessary and advisable for the conservation of the species.

(4) For the Pearl River map turtle's 4(d) rule, we do not include an exception from the incidental take prohibition resulting from maintenance dredging activities that remain in the previously disturbed portion of a maintained channel. We determined that this exception is too vague and could have caused confusion regarding whether State or Federal regulatory processes apply to these activities. In addition, dredging activities to promote river traffic can cause temporary turbidity, leading to smothering of prey species (*e.g.,* aquatic invertebrates) and decreased ability of the Pearl River map turtle to forage on these species; the removal of underwater snags, which could further reduce prey availability by eliminating areas where prey is found; and the removal of sheltering and basking locations for the turtle. All in-water work, including dredging in a previously dredged area, requires appropriate State and Federal permits, so including this exception could have been interpreted as removing this requirement, which was not our intention. Therefore, we find that finalizing a 4(d) rule that included this exception to incidental take is not necessary and advisable for the conservation of the species.

(5) For the Pearl River map turtle's 4(d) rule, we do not include an exception to the incidental take prohibitions resulting from herbicide/pesticide use in this final rule. We do not have enough information about the types or amounts of pesticides that may be applied in areas where Pearl River map turtle occurs to be able assess the future impacts to the species. The additional materials provided during the public comment period indicate impacts to other turtle species from pesticide use occurs (de Solla et al. 2014, entire; Douros et al. 2015, pp.113–114 ; Kittle et al. 2018, entire; Smith et al. 2020, entire; EPA 2021a, at Ch. 4, Appendix 4–1; EPA 2021d, at Ch. 2; EPA 2021e, at Ch. 2, EPA2021e, at Ch. 4, Appendix 4–1). Further, we note that the Environmental Protection Agency (EPA) has not consulted on most pesticide registrations to date, so excepting take solely based on user compliance with label directions and State and local regulations EPA has not consulted on most pesticide registrations to date and is not appropriate in this situation. Retaining this exception in the absence of consultation on a specific pesticide registration may create confusion regarding the consideration of these impacts and whether Federal regulatory processes apply to these activities. It was not our intent to supersede the consultation on the pesticide registration nor other Federal activities. Therefore, we find that finalizing a 4(d) rule that included this exception to incidental take is not necessary and advisable for the conservation of the species.

(6) For the Pearl River map turtle 4(d) rule and Alabama map turtle, Barbour's map turtle, Escambia map turtle, and Pascagoula map turtle 4(d) rule, we make minor revisions to the preamble's description of the prohibitions and exceptions in our rule issued under section 4(d) of the Act (''4(d) rule'') in the preamble of this final rule to be consistent with the regulatory text that sets forth the 4(d) rule. While we have refined the text, the substance of the prohibitions and exceptions has not changed, except as outlined above.

In addition, we inadvertently left off from the proposed 4(d) rule for the Alabama map turtle, Barbour's map turtle, Escambia map turtle, and Pascagoula map turtle the 17.21(d)(2) provision regarding possession and engaging in other acts with unlawfully endangered wildlife by Federal and State law enforcement, and we have added this to final rule itself.

(7) We update the information on the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES; 27 U.S.T. 1087, TIAS 8249) to reflect that the Pearl River map turtle (*Graptemys pearlensis*), Alabama map turtle (*Graptemys pulchra*), Barbour's map turtle (*Graptemys barbouri*), Escambia map turtle (*Graptemys ernsti*), and Pascagoula map turtle (*Graptemys gibbonsi*) were transferred from Appendix III of CITES to Appendix II (CITES 2023, p. 46).

(8) We reevaluated the critical habitat prudency determination for the Pearl River map turtle and now find that critical habitat is prudent but not

determinable at this time for the species. We intend to publish a proposed rule designating critical habitat for the Pearl River map turtle in the near future.

**Summary of Comments and Recommendations**

In our November 23, 2021, proposed rule (86 FR 66624), we requested that all interested parties submit written comments on the proposal by January 24, 2022. We also contacted appropriate Federal and State agencies, scientific experts and organizations, and other interested parties and invited them to comment on the proposal. Newspaper notices inviting general public comment were published in USA Today on December 8, 2021. We did not receive any requests for a public hearing. All substantive information provided to us during the comment period has been incorporated directly into this final rule or is addressed below.

*Peer Reviewer Comments*

As discussed in Peer Review, above, we received comments from five peer reviewers on the draft SSA report. We reviewed all comments we received from the peer reviewers for substantive issues and new information regarding the contents of the SSA report. Most comments received were grammatical and improved accuracy and readability of the SSA. The three substantive comments from peer reviewers are addressed in the following summary. As discussed above, because we conducted this peer review prior to the publication of our November 23, 2021, proposed rule (86 FR 66624), we had already incorporated all applicable peer review comments into version 1.2 of the SSA report (Service 2023, entire), which is the foundation for the proposed rule and this final rule.

The peer reviewers generally concurred with our methods and conclusions and provided additional information and suggestions for clarifying and improving the accuracy of the updated version of the SSA report. Three substantive comments from peer reviewers are addressed in the following summary and were incorporated into the SSA report, version 1.2 (Service 2023, entire), as appropriate.

*Peer Reviewer Comments*

*(1) Comment:* One peer reviewer questioned how the assessment of future condition of the Pearl River map turtle could be conducted without knowing population trends through time compared to historical baseline data or through the use of demographic or viability models.

*Our Response:* Limited historical data exist for the Pearl River map turtle to provide a sufficient baseline to determine current or future population trends or densities. In addition, the limited amount of historical data prohibited the Service from modeling population viability or demographics. The best available science was used to assess future condition based on projected increases in potential threats, which resulted in the Service concluding that the Pearl River map turtle meets the Act's definition of a threatened species. We have added a statement in the SSA report to clarify the lack of research on population trends and demographics through time.

*(2) Comment:* One peer reviewer questioned if locations that were deemed high density for the population estimates are actually comparable to historical high density or are just populations that are slowly declining towards extirpation.

*Our Response:* Since historical densities are unknown, it was not feasible to determine if locations recently classified as high density are comparable to historical high-density locations. Density classifications were based on recent basking density surveys (Lindeman et al. 2020, entire) representing the current status of the Pearl River map turtle.

*(3) Comment:* One peer reviewer mentioned water quality issues associated with large-scale chicken operations on the Strong River.

*Our Response:* To determine how this additional water quality information would impact the overall composite score, we decreased the water quality score for the Pearl River-Strong and Pearl River-Silver resilience units from moderate to low; however, the overall composite score for both resilience units is still classified as moderate even with a low water quality classification. Thus, the overall composite score for the resilience units did not change, and we retain the original scoring classifications. We appreciate the additional reference material, and these water quality issues were updated in the SSA report, version 1.2 (Service 2023, pp. 25–27, 65).

*Comments From States*

The Georgia Department of Natural Resources (GaDNR) Wildlife Resources Division provided a comment letter in support of listing the Barbour's map turtle and Escambia map turtle as threatened due to similarity of appearance. The Mississippi Department of Wildlife, Fisheries, and Parks (MDWFP) provided a comment letter in support of listing the Pearl River map turtle as threatened and listing the Pascagoula map turtle, Alabama map turtle, Escambia map turtle, and Barbour's map turtle as threatened due to similarity of appearance. The Florida Fish and Wildlife Conservation Commission (FWC) submitted a letter in opposition to listing the Escambia map turtle and Barbour's map turtle as threatened due to similarity of appearance because of potential conflicting regulations and expected regulatory confusion within the State. Federal listing would shift permitting for take from FWC to the Service, potentially causing regulatory confusion among stakeholders about: (1) the legality of possession of these species in Florida, and (2) whether or not a State permit for incidental take of these species is required. The Service is actively working with FWC to rectify conflicts between State regulations and those Federal regulations that provide protection under the Act.

*Public Comments*

*(4) Comment:* One commenter questioned the not-warranted finding for the Pascagoula map turtle due to the lower population abundances when compared with other federally threatened map turtles such as the ringed map turtle (*Graptemys oculifera*) and yellow-blotched map turtle (*G. flavimaculata*).

*Our Response:* Listing of a species is not dependent upon the population abundances of previously listed species. The Pascagoula map turtle does not meet the Act's definition of either an endangered species or a threatened species based on the analysis of its current and future conditions using the best available science. The 12-month finding and all other supporting information can be found on the internet at *https://www.regulations.gov* under Docket No. FWS–R4–ES–2021–0097.

However, in this rule, we are listing the Pascagoula map turtle along with Alabama map turtle (*Graptemys pulchra*), Barbour's map turtle (*Graptemys barbouri*), and Escambia map turtle (*Graptemys ernsti*) as threatened species due to similarity of appearance to the Pearl River map turtle.

*(5) Comment:* One commenter stated that the Pearl River map turtle is not a separate species based on a publication by Praschag et al. (2017).

*Our Response:* The Pearl River map turtle was initially described as a new species based on mitochondrial DNA (mtDNA) sequences, significant carapace pattern variation, morphological differentiation, and

allopatric distributions between the Pearl River map turtle and the Pascagoula map turtle (Ennen et al. 2010, entire). For example, mtDNA sequences showed greater genetic differentiation between the Pearl River map turtle in the Pearl River and the Pascagoula map turtle in the Pascagoula River than mtDNA sequence differences between two other recognized, and reciprocally sympatric, species: ringed map turtle in the Pearl River and yellow-blotched map turtle in the Pascagoula River (Ennen et al. 2010, entire). However, a 2017 study, using mtDNA and 12 nuclear loci, determined that the Pearl River map turtle is not a separate species from the Pascagoula map turtle, and that the genus *Graptemys* is taxonomically over split (Praschag et al. 2017, entire). We considered this information and disregarded it due to the captive origin of the sampled turtles used (Praschag et al. 2017, p. 677), as well as the genetic analyses that were called into question (Thomson et al. 2018, p. 68). The most recent comprehensive genetic analysis (18 nuclear genes and 2 mtDNA sequences) that assessed wild *Graptemys* determined that the Pearl River map turtle is a valid species (Thomson et al. 2018, entire). Additionally, several other recent publications recognize the Pearl River map turtle as a separate species from the Pascagoula map turtle (Lindeman et al. 2020, entire; Selman and Lindeman 2020, entire; Vučenović and Lindeman 2021, entire; Selman 2020b, entire; Smith et al. 2020, entire).

*(6) Comment:* One commenter stated that, due to the difficulty of identifying the Pearl River map turtle, research conducted by college and graduate students on this species is not reliable and cannot be used to determine populations.

*Our Response:* A species expert stated that only 5 to 10 professionals can distinguish the difference among the megacephalic map turtles: Pearl River map turtle, Pascagoula map turtle, Alabama map turtle, Escambia map turtle, and Barbour's map turtle (Selman 2021, pers. comm.). There are only two native map turtle species within the Pearl River drainage: the megacephalic Pearl River map turtle and the microcephalic ringed map turtle. Unlike distinguishing among megacephalic map turtle species, these two species can be readily identified from one another by trained students utilizing morphological characteristics including proportional head size, head and carapace coloration and patterning, and the distinct rings found on the carapace of the ringed map turtle. Information used within the SSA was gathered by professionals from academia and State and Federal agencies, as well as from graduate students at local universities.

*(7) Comment:* One commenter raised concerns about the reliability of using data from a different species as a surrogate for Pearl River map turtle population estimates. Additionally, the commenter stated that differences in survey techniques for the Pearl River map turtle may have led to inaccurate population estimates.

*Our Response:* As population data were not available for the Pearl River map turtle, population abundance was estimated using a correction factor (based on previous mark-resight studies of the Pascagoula map turtle) to estimate the population abundance of the Pearl River map turtle from basking density surveys conducted within the Pearl River drainage (Lindeman et al. 2020, entire). The Service considers this to be the best available science as the Pascagoula map turtle is the sister species of the Pearl River map turtle (Thomson et al. 2018, entire; Ennen et al. 2010, entire) and both fill a similar role within their respective river drainages. Although survey techniques may have differed among the surveys conducted on the Pearl River map turtle, we used the best available science to assess population status (Lindeman et al. 2020, entire).

*(8) Comment:* One commenter noted the relatively recent discovery of tributary populations that consist of approximately one-third of the total Pearl River map turtle abundance in the river system. The commenter noted that the Service may not have taken potentially unknown tributary populations into consideration during the proposed listing, and that more Pearl River map turtles may reside within these tributaries than was assessed in the SSA.

*Our Response:* The most recently published range map provides the known range of the Pearl River map turtle within the Pearl River and its major tributaries and is based on thorough surveys of the river system (Lindeman et al. 2020, p. 176). This 2020 publication lists the tributaries throughout the drainage that have been surveyed, as well as those tributaries where no Pearl River map turtles were observed (Lindeman et al. 2020, Supplemental Material 2). This information represents the best available science and was incorporated into the SSA, version 1.2 (Service 2023, pp. 45–48).

*(9) Comment:* One commenter stated that the performed models provide insufficient information compared to actual water quality data and that research to determine water quality within the Pearl River would be key to developing a recovery plan. Additionally, the commenter stated that there is speculation regarding how land use factors into the proxy approach.

*Our Response:* Because no long-term (pre-Ross Barnett Reservoir) water quality data exist for the watershed, we used the best available science related to land use as a proxy for water quality. The 2016 National Land Cover Dataset (NLCD) includes different categorizations of agricultural use, urbanization, and forest cover. As stated in the SSA report, version 1.2 (Service 2023, p. 62), urbanization and agricultural land uses were considered as threats impacting water quality, and a land cover percentage was calculated for these threats by using the total land cover (including all NLCD land cover categories) within the buffer around each occupied stream.

*(10) Comment:* One commenter noted that the use of any sea-level rise (SLR) predictions as a threat to future conditions is questionable, as turtles will move in response to inundation, and that the Service needs to gather actual data in order to learn what is important to the survivability of the turtles.

*Our Response:* Sea-level rise is expected to impact one location inhabited by Pearl River map turtles within the West Pearl River and up to 10.8 river miles (rmi) (17.4 river kilometers (rkm)) of occupied habitat within the East Pearl River under the ''extreme'' SLR scenario (Service 2023 p. 87). These turtles may move upstream; however, SLR eliminates suitable habitat for the species in the Pearl River and lower sections of the Bogue Chitto River due to increased salinity. A 2009 study provides additional evidence that increased salinity can cause population declines in *Graptemys,* as seen by a 50 percent decline in population density of yellow-blotched map turtles (*G. flavimaculata*) within the lower Pascagoula River attributed to Hurricane Katrina storm surge (Selman et al. 2009, entire). We used the best available scientific data to inform how SLR would impact the Pearl River map turtle in the future.

*(11) Comment:* One commenter stated that the Service did not use the best available science related to predation and illegal collection of the Pearl River map turtle due to limited information known about these two potential threats. Additionally, the commenter stated that using the Pascagoula map turtle as a surrogate for the Pearl River

map turtle was not appropriate given their differing diets.

*Our Response:* We used the best available scientific and commercial data on predation, diet, and illegal collection of the Pearl River map turtle in the SSA report to inform the proposed, and this final, threatened species status determination for the Pearl River map turtle. Regarding predation of the Pearl River map turtle, we address the information in the SSA report, version 1.2 (Service 2023, pp. 28–29), as no other studies are available and no additional information regarding predation was provided during the November 23, 2021, proposed rule's comment period.

Regarding information about diet, some variation exists between the Pearl River map turtle and the Pascagoula map turtle's food preferences (McCoy et al. 2020, entire; Vučenović et al. 2021, entire); however, both species rely predominantly on aquatic invertebrates, which are affected similarly by water quality (Jones et al. 2021, p. 14; Lydeard et al. 2004, entire).

Although little information exists on the current collection and/or trade of the Pearl River map turtle, exploitation of the megacephalic map turtles (*Graptemys* spp.) for the pet trade has been documented (Lindeman 1998, p. 137; Cheung and Dudgeon 2006, p. 756; Service 2006, p. 2; Selman and Qualls 2007, pp. 32–34; Ennen et al. 2016, p. 094.6). Additionally, rare species are more sought after for the pet trade (Sung and Fong 2018, p. 221), potentially leading to higher exploitation of the species.

*(12) Comment:* One commenter stated that listing the Pascagoula map turtle, Alabama map turtle, Escambia map turtle, and Barbour's map turtle as threatened due to similarity of appearance does not create any additional protection or remove any additional threats to the Pearl River map turtle as it is the only one of the above-mentioned turtle species that occur in the Pearl River drainage.

*Our Response:* As stated in the proposed rule (86 FR 66624 at 66655; November 23, 2021), the slight morphological and color pattern differences within the megacephalic map turtle clade makes identification of species difficult when collection location is unknown (Selman 2019, pers. comm.). This difficulty can lead to an additional threat for Pearl River map turtles, with collected individuals being misrepresented as other members of the megacephalic map turtle clade (Pascagoula map turtle, Alabama map turtle, Escambia map turtle, or Barbour's map turtle) within the pet trade. Difficulty in identification and the additional threat of misrepresenting the Pearl River map turtle as another species meets the definition of similarity of appearance set forth in section 4(e) of the Act (16 U.S.C. 1533(e)) and explained in the proposed rule (86 FR 66624 at 66655; November 23, 2021) and this final rule.

*(13) Comment:* Six commenters expressed concern that the Service's description of the 4(d) rule's incidental take exception for construction, operation, and maintenance activities occurring near- and in-stream is too broad and should be more narrowly defined or removed.

*Our Response:* We agree that it is difficult to understand and identify specific situations for which the proposed exception for incidental take resulting from construction, operation, and maintenance activities would apply. Accordingly, as stated above under Summary of Changes from the Proposed Rule, we are not including this as an exception to the incidental take prohibitions in the 4(d) rule for the Pearl River map turtle because it is too vague and would have caused confusion with respect to requirements that must be met when undertaking these activities. Many activities occurring near or in a stream require permits or project review by Federal or State agencies. Therefore, we find that finalizing a 4(d) rule that included this exception to incidental take is not necessary and advisable for the conservation of the species.

*(14) Comment:* One commenter questioned how the Service will monitor maintenance dredging activities in order to ensure that these activities will not encroach upon suitable turtle habitat outside of the maintained waterway and how the Service will enforce any violations.

*Our Response:* Accordingly, for the reasons stated above under Summary of Changes from the Proposed Rule, we are not including the proposed exception for incidental take resulting from maintenance dredging activities from the 4(d) rule for the Pearl River map turtle. The proposed exception is too vague and would have caused confusion with respect to requirements that must be met when undertaking these activities. Many activities occurring near or in a stream require permits or project review by Federal or State agencies. Therefore, we find that finalizing a 4(d) rule that included this exception to incidental take is not necessary and advisable for the conservation of the species.

In terms of monitoring these types of activities, through section 7 consultation, maintenance dredging activities will be monitored so that these activities do not encroach upon suitable turtle habitat outside of the maintained waterway.

*(15) Comment:* Seven commenters expressed concern about adopting an incidental take exception for pesticide and herbicide use that follows chemical label and appropriate application rates. One commenter stated that exposure to pesticides and herbicides is harmful to turtle species and provided several citations to support the comment (such as, de Solla et al. 2014, entire; Kittle et al. 2018, entire).

*Our Response:* After review of the comments to the proposed rule and revisiting the best available scientific and commercial information, we are not including the pesticide and herbicide use exception from the incidental take prohibitions in the final 4(d) rule. In the proposed and this final rule, we describe the primary threats to the Pearl River map turtle as habitat degradation and loss, collection, and effects of climate change. In the preamble of our proposed 4(d) rule, we proposed an exception to incidental take prohibitions resulting from invasive species removal activities using pesticides and herbicides as these types of activities could be considered beneficial to the native ecosystem and are likely to improve habitat conditions for the species. However, as described in our SSA (Service 2023, pp. 22–42), invasive species were found to have minimal effects to the species. In addition, we do not have enough information about the types or amounts of pesticides that may be applied in areas where Pearl River map turtle occurs to be able assess the future impacts to the species.

The additional materials provided during the public comment period do not indicate Pearl River map turtle is impacted greatly from pesticides used to reduce impacts from nonnative, invasive species; however, the information provided does indicate impacts to other turtle species from pesticide use (de Solla et al. 2014, entire; Kittle et al. 2018, entire). As documented in other turtle species from the literature provided by the commenter, we assessed that there is the potential of indirect effects from pesticides on the Pearl River map turtle.

Further, we note that the Environmental Protection Agency (EPA) has not consulted on most pesticide registrations to date, so excepting take solely based on users complying with labels is not appropriate in this situation. Therefore, we find that finalizing a 4(d) rule that included this

exception to incidental take is not necessary and advisable for the conservation of the species.

*(16) Comment:* Two commenters stated that recreational and commercial fishing gears are a potential threat to the Pearl River map turtle and should not be excepted from incidental take. Additionally, the commenters stated that the Service should incorporate fisheries bycatch data into the SSA report.

*Our Response:* Few data are available to determine the extent that recreational and commercial fishing have on the Pearl River map turtle. Two recent studies determined that catch per unit effort (CPUE) in hoop nets set in preferred Pearl River map turtle habitat was very low, with 1 Pearl River map turtle captured every 59 to 72 trap nights, respectively (Pearson et al. 2020, pp. 55, 60; Haralson 2021, p. 65). These numbers suggest that commercial and/or recreational fishing may be a low risk to the Pearl River map turtle.

Recreational and commercial fishing activities are regulated by State natural resource and fish and game agencies, and these agencies issue permits for these activities in accordance with their regulations. The Service will coordinate with State agencies to better understand the impacts of permitted recreational and commercial fishing on Pearl River map turtles and may develop a coordinated plan based on the best available science to reduce fishing impacts through research and development on innovative fishing technologies and methodologies to reduce the risk of bycatch. Additionally, we will continue coordinating with State agencies on the development of public awareness programs regarding identification and conservation of the Pearl River map turtle.

*(17) Comment:* Nine commenters claimed that the Service lacks sufficient support for the not prudent finding for critical habitat regarding the increased threat of illegal collection by identifying areas where the turtles may be found. These comments also indicated that the species' location data and maps are already available to the public in published reports.

*Our Response:* In our November 23, 2021, proposed rule (86 FR 66624), we determined that designating critical habitat was not prudent for the Pearl River map turtle. Many species of turtles are affected by poaching worldwide because of the large demand from collectors. Although limited, poaching has been documented for map turtles. Reports and notes included with surveys going back several decades identify poaching as a threat. We based our determination on our finding that poaching may increase because the listing of the species would draw attention to their existence and rarity, possibly creating a greater demand among collectors. We postulated that the publication of maps in the **Federal Register** could facilitate poaching of the species by making it easier to find exact locations where the species is found.

After a thorough reevaluation of the publicly available information regarding the locations of Pearl River map turtles, we have determined that the current locations are currently available in sources readily accessed by the public. These include online conservation databases, scientific journals, and documents found on agency websites. We now acknowledge that publishing critical habitat maps would not provide many, if any, additional details helpful to locate the species, beyond what is already publicly available. In addition, because locations are largely available, the increased threat comes more from the attention drawn by listing the species, rather than the publication of maps depicting critical habitat. For this reason, we have reassessed our prudency determination that designating critical habitat would likely increase the threat of poaching. Consequently, we have determined that the designation of critical habitat is prudent for the Pearl River map turtle. We will publish a proposed rule to designate critical habitat for the Pearl River map turtle in the near future.

## I. Final Listing Determination for the Pearl River Map Turtle

### Background

The Pearl River map turtle (*Graptemys pearlensis*) is a freshwater turtle species belonging to the Emydidae family that includes terrapins, pond turtles, and marsh turtles. Turtles in the genus *Graptemys* are also known as map turtles for the intricate pattern on the carapace that often resembles a topographical map. The Pearl River map turtle is in the megacephalic (large-headed) clade as females grow proportionally larger heads and jaws than males as they age; the carapace length of adult females is over two times the length of adult males on average (Gibbons and Lovich 1990, pp. 2–3). The life history of the Pearl River map turtle can be described as the stages of egg, hatchling, juvenile, and adult. Typically, male map turtles mature in 2 to 3 years, while females mature much later, around 9 years of age (Lindeman 2013, p. 109; Vogt et al. 2019, pp. 557–558).

The species inhabits rivers and large creeks with sand and gravel bottoms in the Pearl River drainage from central Mississippi to the border of southern Mississippi and Louisiana. For the Pearl River map turtle to survive and reproduce, individuals need suitable habitat that supports essential life functions at all life stages. Several elements appear to be essential to the survival and reproduction of individuals: mainstem and tributary reaches within the Pearl River system that have sandbars, adequate flow, an adequate supply of invertebrate prey items including insects and mollusks (particularly freshwater mussels), and an abundance of emergent and floating basking structures of various sizes. The diet of the Pearl River map turtle varies between females and males. Mature females consume mostly Asian clams (*Corbicula fluminea*), while males and juveniles eat insects, with mature males specializing in caddisfly larvae and consuming more mollusks than juveniles (Vučenović and Lindeman 2021, entire; Service 2023, p. 11).

Pearl River map turtles are found in rivers and creeks with sand and gravel bottoms and dense accumulations of deadwood; this species has not been documented in oxbow lakes or other floodplain habitats. They are notably absent from lakes where their sympatric microcephalic species, the ringed map turtle (*Graptemys oculifera*), is present, but do occur at very low densities at the upstream reach of Ross Barnett Reservoir, an impoundment of the Pearl River (Lindeman 2013, p. 298; Selman and Jones 2017, entire). All life stages require adequate water quality within flowing river systems and are largely intolerant of brackish and saltwater environments (Selman and Qualls 2008, pp. 228–229; Lindeman 2013, pp. 396–397). The species requires semi-exposed structure for basking, such as emergent deadwood, which serves as thermoregulatory structure, as foraging structure for males and juveniles (Selman and Lindeman 2015, pp. 794–795), and as an overnight resting place for males and juveniles (Cagle 1952, p. 227).

The species also requires terrestrial nesting habitat where the females excavate nests and lay their eggs on sandbars, and occasionally steep cut-banks, along riverbanks during the late spring and early summer months. Hatchlings typically emerge from the nest at night and after an average of 69 days; the hatchling and small juvenile life stages depend on adequate abundance of invertebrate prey and emergent branches near the riverbank. A more thorough review of the taxonomy,

life history, and ecology of the Pearl River map turtle is presented in detail in the SSA report (Service 2023, pp. 5–19).

**Regulatory and Analytical Framework**

*Regulatory Framework*

Section 4 of the Act (16 U.S.C. 1533) and the implementing regulations in title 50 of the Code of Federal Regulations set forth the procedures for determining whether a species is an endangered species or a threatened species, issuing protective regulations for threatened species, and designating critical habitat for endangered and threatened species. On April 5, 2024, jointly with the National Marine Fisheries Service, the Service issued a final rule that revised the regulations in 50 CFR 424 regarding how we add, remove, and reclassify endangered and threatened species and what criteria we apply when designating listed species' critical habitat (89 FR 24300). On the same day, the Service published a final rule revising our protections for endangered species and threatened species at 50 CFR 17 (89 FR 23919). These final rules are now in effect and are incorporated into the current regulations. Our analysis for this final decision applied our current regulations. Given that we proposed listing for the Pearl River map turtle under our prior regulations (revised in 2019), we have also undertaken an analysis of whether our decision would be different if we had continued to apply the 2019 regulations; we concluded that the decision would be the same. The analyses under both the regulations currently in effect and the 2019 regulations are available on *https://www.regulations.gov.* The Act defines an ''endangered species'' as a species that is in danger of extinction throughout all or a significant portion of its range, and a ''threatened species'' as a species that is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range. The Act requires that we determine whether any species is an endangered species or a threatened species because of any of the following factors:

(A) The present or threatened destruction, modification, or curtailment of its habitat or range;

(B) Overutilization for commercial, recreational, scientific, or educational purposes;

(C) Disease or predation;

(D) The inadequacy of existing regulatory mechanisms; or

(E) Other natural or manmade factors affecting its continued existence.

These factors represent broad categories of natural or human-caused actions or conditions that could have an effect on a species' continued existence. In evaluating these actions and conditions, we look for those that may have a negative effect on individuals of the species, as well as other actions or conditions that may ameliorate any negative effects or may have positive effects.

We use the term ''threat'' to refer in general to actions or conditions that are known to or are reasonably likely to negatively affect individuals of a species. The term ''threat'' includes actions or conditions that have a direct impact on individuals (direct impacts), as well as those that affect individuals through alteration of their habitat or required resources (stressors). The term ''threat'' may encompass—either together or separately—the source of the action or condition or the action or condition itself.

However, the mere identification of any threat(s) does not necessarily mean that the species meets the statutory definition of an ''endangered species'' or a ''threatened species.'' In determining whether a species meets either definition, we must evaluate all identified threats by considering the species' expected response and the effects of the threats in light of those actions and conditions that will ameliorate the threats—on an individual, population, and species level. We evaluate each threat and its expected effects on the species, then analyze the cumulative effect of all of the threats on the species as a whole. We also consider the cumulative effect of the threats in light of those actions and conditions that will have positive effects on the species, such as any existing regulatory mechanisms or conservation efforts. The Secretary determines whether the species meets the definition of an ''endangered species'' or a ''threatened species'' only after conducting this cumulative analysis and describing the expected effect on the species now and in the foreseeable future.

The Act does not define the term ''foreseeable future,'' which appears in the statutory definition of ''threatened species.'' Our implementing regulations at 50 CFR 424.11(d) set forth a framework for evaluating the foreseeable future on a case-by-case basis, which is further described in the 2009 Memorandum Opinion on the foreseeable future from the Department of the Interior, Office of the Solicitor (M–37021, January 16, 2009; ''M-Opinion,'' available online at *https://www.doi.gov/sites/doi.opengov.ibmcloud.com/files/uploads/M-37021.pdf*). The foreseeable future extends as far into the future as the U.S. Fish and Wildlife Service and National Marine Fisheries Service (hereafter, the Services) can make reasonably reliable predictions about the threats to the species and the species' responses to those threats. We need not identify the foreseeable future in terms of a specific period of time. We will describe the foreseeable future on a case-by-case basis, using the best available data and taking into account considerations such as the species' life-history characteristics, threat-projection timeframes, and environmental variability. In other words, the foreseeable future is the period of time over which we can make reasonably reliable predictions. ''Reliable'' does not mean ''certain''; it means sufficient to provide a reasonable degree of confidence in the prediction, in light of the conservation purposes of the Act.

*Analytical Framework*

The SSA report documents the results of our comprehensive biological review of the best scientific and commercial data regarding the status of the species, including an assessment of the potential threats to the species. The SSA report does not represent our decision on whether the species should be listed as an endangered or threatened species under the Act. However, it does provide the scientific basis that informs our regulatory decisions, which involve the further application of standards within the Act and its implementing regulations and policies.

To assess Pearl River map turtle viability, we used the three conservation biology principles of resiliency, redundancy, and representation (Shaffer and Stein 2000, pp. 306–310). Briefly, resiliency is the ability of the species to withstand environmental and demographic stochasticity (for example, wet or dry, warm or cold years), redundancy is the ability of the species to withstand catastrophic events (for example, droughts, large pollution events), and representation is the ability of the species to adapt to both near-term and long-term changes in its physical and biological environment (for example, climate conditions, pathogens). In general, species viability will increase with increases in resiliency, redundancy, and representation (Smith et al. 2018, p. 306). Using these principles, we identified the species' ecological requirements for survival and reproduction at the individual, population, and species levels, and

described the beneficial and risk factors influencing the species' viability.

The SSA process can be categorized into three sequential stages. During the first stage, we evaluated the individual species' life-history needs. The next stage involved an assessment of the historical and current condition of the species' demographics and habitat characteristics, including an explanation of how the species arrived at its current condition. The final stage of the SSA involved making predictions about the species' responses to positive and negative environmental and anthropogenic influences. Throughout these stages, we used the best available information to characterize viability as the ability of a species to sustain populations in the wild over time. We use this information to inform our regulatory decision.

The following is a summary of the key results and conclusions from the SSA report; the full SSA report can be found at Docket FWS–R4–ES–2021–0097 on *https://www.regulations.gov.*

**Summary of Biological Status and Threats**

In this discussion, we review the biological condition of the species and its resources, and the threats that influence the species' current and future condition, in order to assess the species' overall viability and the risks to that viability. Additional details about the species' biology and threats can be found in the SSA report, version 1.2 (Service 2023, entire) and the proposed listing rule (86 FR 66624; November 23, 2021).

*Species Needs*

We assessed the best available information to identify the physical and biological needs to support individual fitness at all life stages for the Pearl River map turtle. Full descriptions of all needs are available in chapter 3 of the SSA report (Service 2023, pp. 20–21), which can be found in Docket No. FWS–R4–ES–2021–0097 on *https://www.regulations.gov.* Based upon the best available scientific and commercial information, and acknowledging existing ecological uncertainties, the resource and demographic needs for breeding, feeding, sheltering, and dispersal of the Pearl River map turtle are characterized as:

- For successful reproduction, the species requires patches of fine sand with sparse vegetation (typically sandbars, occasionally cutbanks) adjacent to adult habitat, adequate sand incubation temperatures to yield an appropriate hatchling sex ratio, and natural hydrologic regimes to prevent nest mortality due to out-of-season flooding.
- Hatchlings require an adequate abundance of invertebrate prey and of emergent branches and tangles near the riverbank for shelter and basking.
- Adult males require an adequate abundance of insect prey and emergent logs, branches, and tangles near the bank for basking and foraging.
- Adult females require an adequate abundance of native mussels or Asian clams; deeper, sand or gravel-bottomed stretches for foraging; and emergent logs and branches for basking.

Population needs include the same requirements as individuals (sandbars; natural hydrologic regimes; and an adequate supply of invertebrate prey items, basking structures, and sand, gravel, or rocky substrates) but must be met at a larger scale. Connectivity that facilitates genetic exchange and maintains high genetic diversity is needed; tributary and mainstem reaches with suitable habitat uninterrupted by impoundments must be sufficient in size to support a large enough population of individuals to avoid issues associated with small populations, such as inbreeding depression.

*Threats*

The following discussions include evaluations of three threats and associated factors that are affecting the Pearl River map turtle and its habitat: (1) habitat degradation or loss, (2) collection, and (3) climate change (Service 2023, chapter 4, pp. 22–42). In addition, potential impacts from disease and invasive species were evaluated but were found to have minimal effects on viability of the species based on current knowledge (Service 2023, pp. 22–42).

Habitat Degradation or Loss

*Water Quality*—Degradation of stream and wetland systems through reduced water quality and increased concentrations of contaminants can affect the occurrence and abundance of freshwater turtles (DeCatanzaro and Chow-Fraser 2010, p. 360). Infrastructure development increases the percentage of impervious surfaces, reducing and degrading terrestrial and aquatic habitats. Increased water volume and land-based contaminants (*e.g.,* heavy metals, pesticides, oils) flow into aquatic systems, modifying hydrologic and sediment regimes of rivers and wetlands (Walsh et al. 2005, entire). Contaminants in the aquatic environment can have both immediate and long-term negative impacts on species and ecosystems by degrading the water quality and causing direct and indirect effects to the species or its required resources (Service 2023, pp. 25–27).

Freshwater mussels and snails are important food sources for the Pearl River map turtle, and sedimentation and pollution can have adverse impacts on mollusk populations (Box and Mossa 1999, entire). Point source pollution can be generated from inadequately treated effluent from industrial plants, sanitary landfills, sewage treatment plants, active surface mining, drain fields from individual private homes, and others (Service 2000, pp. 14–15). Nonpoint source pollution may originate from agricultural activities, poultry and cattle feedlots, abandoned mine runoff, construction, silviculture, failing septic tanks, and contaminated runoff from urban areas (Deutsch et al. 1990, entire; Service 2000, pp. 14–15). These sources may contribute pollution to streams via sediments, heavy metals, fertilizers, herbicides, pesticides, animal wastes, septic tank and gray water leakage, and oils and greases. The contaminants likely have direct (*e.g.,* decreased survival or reproduction or both) and indirect (*e.g.,* loss, degradation, and fragmentation of habitat) effects. Additionally, water quality for the Pearl River map turtle is impacted by activities associated with four processes: channel and hydrology modifications and impoundments, agriculture, development (urbanization), and mining. These processes are discussed in more detail in the proposed listing rule (86 FR 66624 at 66632–66634; November 23, 2021).

Channel and Hydrological Modifications and Impoundments

Dredging and channelization have led to loss of aquatic habitat in the Southeast (Warren Jr. et al. 1997, unpaginated). Dredging and channelization projects are extensive throughout the region for flood control, navigation, sand and gravel mining, and conversion of wetlands into croplands (Neves et al. 1997, unpaginated; Herrig and Shute 2002, pp. 542–543). Many rivers are continually dredged to maintain a channel for shipping traffic. Dredging and channelization modify and destroy habitat for aquatic species by destabilizing the substrate, increasing erosion and siltation, removing woody debris, decreasing habitat heterogeneity, and stirring up contaminants, which settle onto the substrate (Williams et al. 1993, pp. 7–8; Buckner et al. 2002, entire; Bennett et al. 2008, pp. 467–468). Channelization can also lead to headcutting, which causes further erosion and sedimentation (Hartfield 1993, pp. 131–141). Dredging removes

woody debris, which provides cover and nest locations for many aquatic species (Bennett et al. 2008, pp. 467–468). Snags and logs are removed from some sites to facilitate boat navigation (Dundee and Rossman 1989, p. 187). Experiments with manual deposition of deadwood in stretches with less riparian forest have been suggested as potential habitat restoration measures (Lindeman 2019, p. 33).

Stream channelization, point-bar mining, and impoundments were identified as potential threats in a report issued prior to the Pascagoula map turtle and Pearl River map turtle being recognized as taxonomically distinct (Service 2006, p. 2). Channel modification is recognized as a cause of decline in the ringed map turtle, a sympatric endangered species (Lindeman 1998, p. 137). Considerably low densities of Pearl River map turtles were observed in the lower reaches of the Pearl River, where much channelization and flow diversion has occurred (Lindeman et al. 2020, pp. 178, 181).

Impoundment of rivers is a primary threat to aquatic species in the Southeast (Benz and Collins 1997, unpaginated; Buckner et al. 2002, entire). Dams modify habitat conditions and aquatic communities both upstream and downstream of an impoundment (Winston et al. 1991, pp. 103–104; Mulholland and Lenat 1992, pp. 193–231; Soballe et al. 1992, pp. 421–474). Upstream of dams, habitat is flooded, and in-channel conditions change from flowing to still water, with increased depth, decreased levels of dissolved oxygen, and increased sedimentation. Sedimentation alters substrate conditions by filling in interstitial spaces between rocks that provide habitat for many species (Neves et al. 1997, unpaginated). Downstream of dams, flow regime fluctuates with resulting fluctuations in water temperature and dissolved oxygen levels, the substrate is scoured, and downstream tributaries are eroded (Schuster 1997, unpaginated; Buckner et al. 2002, unpaginated). Negative ''tailwater'' effects on habitat can extend many kilometers downstream (Neves et al. 1997, unpaginated). Dams fragment habitat for aquatic species by blocking corridors for migration and dispersal, resulting in population geographic and genetic isolation and heightened susceptibility to extinction (Neves et al. 1997, unpaginated). Dams also preclude the ability of aquatic organisms to escape from polluted waters and accidental spills (Buckner et al. 2002, unpaginated).

Damming of streams and springs is extensive throughout the Southeast (Etnier 1997, unpaginated; Morse et al. 1997, unpaginated; Shute et al. 1997, unpaginated). Most Southeastern streams are impacted by impoundment (Shute et al. 1997, p. 458). Many streams have both small ponds in their headwaters and large reservoirs in their lower reaches. Small streams on private lands are regularly dammed to create ponds for cattle, irrigation, recreation, and fishing, with significant ecological effects due to the sheer abundance of these structures (Morse et al. 1997, unpaginated). Small headwater streams are increasingly being dammed in the Southeast to supply water for municipalities (Buckner et al. 2002, unpaginated), and many Southeastern springs have also been impounded (Etnier 1997, unpaginated). Dams are known to have caused the extirpation and extinction of many Southeastern species, and existing and proposed dams pose an ongoing threat to many aquatic species (Folkerts 1997, unpaginated; Neves et al. 1997, unpaginated; Service 2000, p. 15; Buckner et al. 2002, unpaginated).

On the Pearl River, Ross Barnett Reservoir was constructed between 1960 and 1963 and provides a water supply for the City of Jackson, Mississippi, and the associated area, as well as recreational opportunities on the 33,000-acre (ac) (13,355 hectares (ha)) lake and the 17,000 ac (6,880 ha) surrounding it (Pearl River Valley Water Management District 2020, entire). A total of 20.9 rmi (33.6 rkm) of the Pearl River that was previously suitable habitat is now submerged beneath the Ross Barnett Reservoir (Lindeman et al. 2020, p. 173). The Ross Barnett Reservoir has greatly reduced habitat suitability of five percent of the mainstem Pearl River by altering the lotic (flowing water) habitat preferred by Pearl River map turtles to lentic (lake) habitat and fragmented the contiguous habitat for the species. Low population densities of Pearl River map turtles have been observed upstream of the Ross Barnett Reservoir, possibly due to recreational boating and extended recreational foot traffic or camping on sandbars by reservoir visitors (Selman and Jones 2017, pp. 32–34). Between the late 1980s and early 2010s, notable population declines also have been observed in the stretch of the Pearl River downstream of the Ross Barnett Reservoir (north of Lakeland Drive), but the exact reason for the decline is unknown (Selman 2020b, p. 194). Additionally, plans for new reservoirs on the Pearl River both upstream and downstream of Jackson have been or are being considered (Lindeman 2013, pp. 202–203). Up to 170 individual Pearl River map turtles could be impacted by the construction of the One Lake Project, one of several proposed impoundments (Selman 2020b, entire).

*Agriculture*—Agricultural land uses occur across the Pearl River basin (Service 2023, pp. 52–57). Some agricultural practices degrade habitat by eroding stream banks, resulting in alterations to stream hydrology and geomorphology. Nutrients, bacteria, pesticides, and other organic compounds are generally found in higher concentrations in areas affected by agriculture than in forested areas. Contaminants associated with agriculture (*e.g.,* fertilizers, pesticides, herbicides, and animal waste) can cause degradation of water quality and habitats through instream oxygen deficiencies, excess nutrification, and excessive algal growths. These, in turn, alter the aquatic community composition, shifting food webs and stream productivity, forcing altered behaviors, and even having sublethal effects or outright killing individual aquatic organisms (Petersen et al. 1999, p. 6). These alterations likely have direct (*e.g.,* decreased survival or reproduction or both) and indirect (*e.g.,* loss, degradation, and fragmentation of habitat) effects on the Pearl River map turtle or its habitat.

Land conversion from agricultural development may also reduce the amount of adjacent riparian forest available to produce deadwood; in another megacephalic map turtle species (Barbour's map turtle), turtle abundance decreased in areas where adjacent riparian corridors had been disturbed by agriculture, while the abundance of the red-eared slider (*Trachemys scripta*), a cosmopolitan species, increased (Sterrett et al. 2011, entire).

Pesticide application and use of animal waste for soil amendment are becoming common in many regions and pose a threat to biotic diversity in freshwater systems. Over the past two decades, these practices have corresponded with marked declines in populations of fish and mussel species in the Upper Conasauga River watershed in Georgia and Tennessee (Freeman et al. 2017, p. 419) that are prey sources for the megacephalic Alabama map turtle. Nutrient enrichment of streams was widespread, with nitrate and phosphorus exceeding levels associated with eutrophication, and hormone concentrations in sediments were often above those shown to cause endocrine disruption in

fish, possibly reflecting widespread application of poultry litter and manure (Lasier et al. 2016, entire). Researchers postulate that species declines observed in the Conasauga watershed may be at least partially due to hormones, as well as excess nutrients and herbicide surfactants (Freeman et al. 2017, p. 429). Similar effects may be associated with these practices in the Pearl River watershed.

*Development*—The Pearl River map turtle's range includes areas of the Pearl River that are adjacent to several urban areas, including the Jackson, Mississippi, metropolitan area where urbanization is expected to increase, as well as other areas within the Pearl River basin that are expected to grow in the future, including the cities of Monticello and Columbia, Mississippi. Urbanization is a significant source of water quality degradation that can reduce the survival of aquatic organisms. Urban development can stress aquatic systems and affect the availability of prey items and suitable habitat for aquatic turtles. In addition, sources and risks of an acute or catastrophic contamination event, such as a leak from an underground storage tank or a hazardous materials spill on a highway or by train, increase as urbanization increases.

*Mining*—The rapid rise in urbanization and construction of large-scale infrastructure projects are driving increasing demands for construction materials such as sand and gravel. Rivers are a major source of sand and gravel because transport costs are low; river energy produces the gravel and sand, thus eliminating the cost of mining, grinding, and sorting rocks; and the material produced by rivers tends to consist of resilient minerals of angular shape that are preferred for construction (Koehnken et al. 2020, p. 363). Impacts of sand and gravel mining can be direct or indirect. Direct impacts include physical changes to the river system and the removal of gravel and floodplain habitats from the system. Indirect impacts include shifting of habitat types due to channel and sedimentation changes; changes in water quality, which alter the chemical and physical conditions of the system; and hydraulic changes that can impact movement of species and habitat availability, which is vital for supporting turtle nesting and basking activities.

Gravel mining is a major industry in southeastern Louisiana, particularly along the Bogue Chitto River, within the range of the Pearl River map turtle (Selman 2020a, p. 20). Instream and unpermitted point-bar mining was observed in the late 1990s and was the biggest concern for *Graptemys* species in the Bogue Chitto River (Shively 1999, pp. 10–11). Gravel mining is perhaps still the greatest threat to the Pearl River system in southeastern Louisiana, particularly in the Bogue Chitto floodplain where run-off and effluents would affect river stretches downstream of these point sources (Selman 2020a, p. 20). Gravel mining can degrade water quality, increase erosion, and ultimately impact movement and habitat quality for aquatic species such as the Pearl River map turtle (Koehnken et al. 2020, p. 363). A recent comparison of aerial imagery from the mid-1980s and late 1990s with images from 2019 revealed increases in the distribution and magnitude of gravel mines in the Bogue Chitto River system, and recent surveys have reported several areas where mining appears to have degraded water quality significantly (Selman 2020a, pp. 20–21, 40). Although Louisiana and Mississippi have reduced the number of gravel mining permits issued in those States, mining in the floodplain continues to be a significant threat to the Pearl River map turtle.

Collection

According to a species expert, collection of wild turtles in the Pearl River system is probably occurring, and similar to what has been observed in other States, these turtles are likely destined for the high-end turtle pet trade in China and possibly other Southeast Asian countries (Selman 2020a, p. 23). Information has been documented from three different local individuals, at three different locations, concerning turtle bycatch or harvest in local Louisiana waterways occupied by Pearl River map turtles (Selman 2020a, pp. 22–23). The specific species captured were not documented; however, it is likely that at least some of these turtles were Pearl River map turtles.

The Service manages information related to species exports in the Law Enforcement Management Information System (LEMIS). According to a LEMIS report from 2005 to 2022, more than 1.5 million turtles identified as *Graptemys* spp. or their parts were exported from the United States to 29 countries (Service 2023, appendix B). Collection is allowed in Mississippi with an appropriate license through the State; a person may possess and harvest from the wild no more than 10 non-game turtles per license year. No more than four can be of the same species or subspecies. It is illegal to harvest turtles between April 1 and June 30 (see title 40 of the Mississippi Administrative Code at part 5, rule 2.3 (''Regulations Regarding Non-game Wildlife in Need of Management'')). In Louisiana, a recreational basic fishing license is required but allows unlimited take of most turtle species, including the Pearl River map turtle; exceptions are that no turtle eggs or nesting turtles may be taken (Louisiana Department of Wildlife and Fisheries (LDWF) 2020a, pp. 50–51). A recreational gear license is also required for operating specified trap types; for example, a recreational gear license is required when operating five or fewer hoop nets, but operating more than five hoop nets requires a commercial fisherman license (see Louisiana Revised Statutes, title 56, chapter 1, parts VI and VII, for details on licensing requirements, trap types).

Climate Change

In the southeastern United States, climate change is expected to result in a high degree of variability in climate conditions with more frequent drought, more extreme heat (resulting in increases in air and water temperatures), increased heavy precipitation events (resulting in increased flooding), more intense storms (*e.g.,* increased frequency of major hurricanes), and rising sea level and accompanying storm surge (Intergovernmental Panel on Climate Change (IPCC) 2023, entire). Warming in the Southeast is expected to be greatest in the summer, which is predicted to increase drought frequency, while annual mean precipitation is expected to increase slightly, leading to increased flooding events (IPCC 2023, entire; Alder and Hostetler 2013, unpaginated).

The dual stressors of climate change and direct human impact have the potential to impact aquatic ecosystems by altering stream flows and nutrient cycles, eliminating habitats, and changing community structure (Moore et al. 1997, p. 942). Increased water temperatures and alterations in stream flow are the most likely climate change effects that will impact stream communities (Poff 1992, entire), and each of these variables is strongly influenced by land use patterns. Increased urbanization may lead to more impervious surfaces, increasing runoff and flashiness of stream flows (Nelson et al. 2009, pp. 156–159).

*Increasing Temperatures*—Climate change may affect the viability of the Pearl River map turtle through temperature-dependent sex determination (TSD) during embryo development within buried nests. In turtle species that exhibit TSD, increasing seasonal temperatures may result in skewed sex ratios among hatchlings. This could be an important factor as climate change drives

increasing temperatures. Since male map turtles develop at lower temperatures than females, rising temperatures during developmental periods may result in sex ratios that are increasingly female-biased; however, microevolution of TSD thermal sensitivity and the mother's ability for nest-site selection may partially mitigate the impact of increasing temperatures on sex determination of hatchlings (Refsnider et al. 2016, entire). There are approximately eight more nights per year with a temperature above 70 degrees Fahrenheit (21.1 degrees Celsius) in the southeastern United States, with an additional 30 days per year over 95 degrees Fahrenheit (37.8 degrees Celsius) projected into the future with an additional 3.6-degree Fahrenheit (2 degree Celsius) warming (Marvel et al. 2023, pp. 2–18, 2–24).

*Drought*—The Pearl River map turtle and its predominant prey species are riverine obligates that require adequate flow to complete their life cycles. Based on down-scaled climate models for the southeastern United States, the frequency, duration, and intensity of droughts are likely to increase in the future (Keellings and Engstrom 2019, pp. 4–6), limiting flow in the rivers and streams occupied by the species and its prey. Stream flow is strongly correlated with important physical and chemical parameters that limit the distribution and abundance of riverine species (Power et al. 1995, entire; Resh et al. 1988, pp. 438–439); as such, the invertebrate prey of the Pearl River map turtle may experience declines associated with the effects of droughts (Haag and Warren 2008, entire; Aspin et al. 2019, entire). Additionally, turtles may experience changes in sex ratio of offspring, growth, and behavior because of extreme or prolonged drought (Powell et al. 2023, entire).

*Sea-level Rise*—The rate of global SLR is accelerating and is currently estimated to be about 0.14 inches (in) (3.6 millimeters (mm)) per year (National Oceanic and Atmospheric Administration (NOAA) 2022, unpaginated). It is estimated that sea levels will rise at least 1 foot (ft) (0.3 meters (m)) above year 2000 levels by the century's end (NOAA 2022, unpaginated). However, some research suggests the magnitude may be far greater than previously predicted due to recent rapid ice loss from Greenland and Antarctica (Rignot and Kanagaratnam 2006, pp. 989–990). Accounting for this accelerated melting, sea level could rise upwards of 12 ft (3.7 m) higher in 2150 than it was in 2000 (NOAA 2022, unpaginated).

SLR is likely to impact downstream Pearl River map turtle populations directly by reducing the quality and quantity of available habitat through increased salinity of the freshwater system upstream from the Gulf of Mexico (Service 2023, pp. 86–90). SLR may also affect the salt marsh wetlands at the mouth of the Pearl River, deteriorating the protective effect of the marsh in reducing saltwater intrusion. Barrier islands off the coast may also be submerged, resulting in loss of the protections provided by the small land masses that buffer the effects of hurricanes and storms. Although some species of *Graptemys* appear to handle some salinity increases, there is evidence that the group is largely intolerant of brackish and saltwater environments (Selman and Qualls 2008, pp. 228–229; Selman et al. 2013, p. 1201; Lindeman 2013, pp. 396–397).

*Hurricane Regime Changes; Increased Intensity and Frequency*—Since 1996, the frequency of hurricane landfalls in the southeastern United States has increased, and that trend is predicted to continue for some years into the future (Goldenberg et al. 2001, p. 475; Emanuel 2005, entire; Webster et al. 2005, p. 1845). Increasing frequency of storms and subsequent storm surges, compounded with SLR, will likely exacerbate saltwater intrusion into the coastal river systems. Conditions that result from storm surge that correspond with high tides are amplified and change the salinity of waters ever farther upstream, negatively affecting freshwater species that are not tolerant of saline conditions, including map turtles.

*Hurricane Regime Changes; Increased Precipitation and Flooding*—While river flooding under natural hydrologic conditions is important for sandbar construction and deposition of basking structure (Dieter et al. 2014, pp. 112–117), an increase in hurricane frequency and stochastic catastrophic floods could cause an increase in nest mortality. Climate change will continue affecting the species into the future, with chronic and acute exposure to the resulting changes in its aquatic and terrestrial habitats over time.

Additional Stressors

Additional stressors that affect the Pearl River map turtle that are not well studied or considered major threats to the species' viability include disease, contaminants, and persecution by humans. Some of the contaminants include pesticides (*e.g.,* herbicides and insecticides) and heavy metals. The culmination of stress due to disease and chronic exposure to contaminants may exacerbate the effects of the other threats on individuals. Wanton shooting of turtles has been documented for *Graptemys* species and may impact populations (Lindeman 1998, p. 137; Service 2006, p. 2); however, this action often goes unreported and is thus difficult to study and/or quantify.

*Conservation Efforts and Regulatory Mechanisms*

Existing regulatory mechanisms that protect the Pearl River map turtle include Federal and State protections of the species and its habitat.

Federal

The Clean Water Act of 1972 (33 U.S.C. 1251 *et seq.*) regulates dredge and fill activities that would adversely affect wetlands. Such activities are commonly associated with dry land projects for development, flood control, and land clearing, as well as for water-dependent projects such as docks/marinas and maintenance of navigational channels. The U.S. Army Corps of Engineers (Corps) and the Environmental Protection Agency (EPA) share the responsibility for implementing the permitting program under section 404 of the Clean Water Act. Permit review and issuance follows a process that encourages avoidance, minimizing and requiring mitigation for unavoidable impacts to the aquatic environment and habitats. This includes protecting the riverine habitat occupied by the Pearl River map turtle. This law has resulted in some enhancement of water quality and habitat for aquatic life, particularly by reducing point-source pollutants. The EPA's regulatory mechanisms have improved water quality within the Pearl River drainage, as evidenced by a resurgence of intolerant fishes (Wagner et al. 2018, p. 13). Because the Pearl River map turtle has a greater tolerance for variances in water quality compared to intolerant fishes, these regulatory mechanisms provide protection for the species and its habitat from the threat of water quality degradation; however, there are instances where sources exceed EPA thresholds and degrade water quality (Mississippi Department of Environmental Quality 2019, entire).

Additionally, Federal agencies are required to evaluate the effects of their discretionary actions on federally listed species and must consult with the Service if a project may affect a species listed under the Endangered Species Act. Such discretionary Federal actions within the Pearl River map turtle's habitat that may affect other listed species include: maintenance dredging for navigation in the lower Pearl River by the Corps and their issuance of

section 404 Clean Water Act permits; construction and maintenance of gas and oil pipelines and power line rights-of-way by the Federal Energy Regulatory Commission; EPA pesticide registration; construction and maintenance of roads or highways by the Federal Highway Administration; and funding of various projects administered by the U.S. Department of Agriculture's Natural Resources Conservation Service and the Federal Emergency Management Agency. Section 7 consultations on other federally listed aquatic species are known to frequently require and recommend Federal agencies implement conservation measures, best management practices, and other actions that may also minimize or eliminate potential harmful effects on the Pearl River map turtle and encourage best management practices for all aquatic species. Accordingly, requirements under section 7 of the Act may provide some protections indirectly to the Pearl River map turtle and its habitat.

National Wildlife Refuges

The National Wildlife Refuge System Administration Act (NWRAA; 16 U.S.C. 668dd *et seq.*) represents organic legislation that set up the administration of a national network of lands and water for the conservation, management, and restoration of fish, wildlife, and plant resources and their habitats for the benefit of the American people that is managed by the Service. Conservation-minded management of public lands allows for: (1) natural processes to operate freely, and thus changes to habitat occur due to current and future environmental conditions; (2) managing the use of resources and activities, which minimizes impacts; (3) preservation and restoration to maintain habitats; and (4) reduction of the adverse physical impacts from human use. Amendment of the NWRAA in 1997 (Pub. L. 105–57) required the refuge system to ensure that the biological integrity, diversity, and environmental health of refuges be maintained.

The Pearl River map turtle occurs on the Bogue Chitto National Wildlife Refuge within Pearl River County, Mississippi, and St. Tammany and Washington Parishes, Louisiana. A comprehensive conservation plan (CCP) has been developed to provide the framework of fish and wildlife management on the refuge (Service 2011, entire). Within the CCP, specific actions are described to protect the ringed map turtle that will also benefit the Pearl River map turtle. Actions include ongoing habitat management to provide downed woody debris for basking turtles and to maintain 330-ft (100.6-m) buffers along all named streams during forest habitat improvement and harvest to protect water quality in streams (Service 2011, pp. 21, 73, 89, 179).

National Forests

The National Forest Management Act of 1976 (16 U.S.C. 1600 *et seq.*) provides standards for National Forest management and planning to protect the designated forest lands while maintaining viable populations of existing native and desired nonnative vertebrate species. The 2012 Planning Rule (77 FR 21162; April 9, 2012) requires that the U.S. Forest Service develop land management plans for all units within the National Forest system. The National Forests in Mississippi have adopted, and in most cases exceeded, the best management practices (BMPs) established by the State of Mississippi (U.S. Forest Service 2014, p. 66) (see discussion below of State BMPs). These measures include practices such as establishing streamside buffer zones, restricting vegetation management in riparian zones, and employing erosion control measures. The Bienville National Forest has no known records for the Pearl River map turtle but contains tributaries that flow into the Pearl and Strong Rivers; thus, these practices may provide some protective measures for habitat occupied by the species downstream. The regulations and practices applied across the National Forests upstream from Pearl River map turtle habitat provide protections for the species' aquatic habitat and contribute to the conservation of the species.

Department of Defense Integrated Natural Resources Management Plans

The Sikes Act Improvement Act of 1997 (Pub. L. 105–85) led to Department of Defense guidance regarding development of integrated natural resources management plans (INRMPs) for promoting environmental conservation on military installations. The U.S. Navy operates the Stennis Western Maneuver Area located along the western edge of the National Aeronautics Space Administration Stennis Space Center and incorporated into the Stennis Space Center Buffer Zone. The Stennis Western Maneuver Area encompasses a 4-mi reach of the East Pearl River and a smaller eastern tributary named Mikes River in Hancock and Pearl River Counties, Mississippi (Buhlman 2014, p. 4). These river reaches are used by the U.S. Navy's Construction Battalion Center for riverboat warfare training. The western bank of the East Pearl River denotes the boundary of the U.S. Navy property and is managed as the Pearl River Wildlife Management Area by the State of Louisiana (see discussion below under *State Protections,* ''Louisiana''). Based on known records of the Pearl River map turtle, the U.S. Navy has developed an INRMP for the Stennis Western Maneuver Area (Buhlman 2014, pp. 11–12, 31–32; U.S. Navy 2011, entire). Measures within the INRMP are expected to protect listed species and the Pearl River map turtle, and include erosion and storm water control, floodplain management, invasive plant species management, and the use of an ecosystem approach to general fish and wildlife management (U.S. Navy 2011, pp. 4–4–4–20).

International Protections

Convention on International Trade in Endangered Species of Wild Fauna and Flora, Appendix III

All species of *Graptemys* were included on the Convention on International Trade in Endangered Species of Wild Fauna and Flora's (CITES) Appendix III in 2005 (CITES 2019, p. 43; 70 FR 74700, December 16, 2005). In 2023, all megacephalic map turtles, including the Pearl River map turtle, were upgraded to CITES Appendix II (CITES 2023, p. 46). Appendix II includes species that, although not necessarily now threatened with extinction, may become so unless trade in them is strictly controlled. Appendix II also includes species that must be subject to regulation in order that trade in other CITES-listed species may be brought under effective control. Such ''look alike'' inclusions usually are necessary because of the difficulty inspectors have at ports of entry or exit in distinguishing one species from other species.

State Protections

Louisiana

The species has no State status under Louisiana regulations or law (LDWF 2021, entire). In Louisiana, a recreational basic fishing license is required but allows unlimited take of most species of turtles, including the Pearl River map turtle; exceptions are that no turtle eggs or nesting turtles may be taken (LDWF 2020, pp. 50–51). A recreational gear license is also required for operating specified trap types; for example, a recreational gear license is required when operating five or fewer hoop nets, but operating more than five hoop nets requires a commercial fisherman license (see Louisiana

Revised Statutes, title 56, chapter 1, parts VI and VII, for details on licensing requirements, trap types).

The Louisiana Scenic Rivers Act (1988; see Louisiana Revised Statutes, title 56, chapter 8, part II) was established as a regulatory program administered by the Louisiana Department of Wildlife and Fisheries (LDWF) through a system of regulations and permits. Rivers with the natural and scenic river designation that are occupied by the Pearl River map turtle include the Bogue Chitto River, Holmes Bayou, and West Pearl River in St. Tammany Parish and Pushepatapa Creek in Washington Parish (Louisiana Department of Agriculture and Forestry (LDAF) undated, p. 48). Certain actions that may negatively affect the Pearl River map turtle are either prohibited or require a permit on rivers included on the State's natural and scenic river list. Prohibited actions include channelization, channel realignment, clearing and snagging, impoundments, and commercial clearcutting within 100 ft (30.5 m) of the river low water mark (LDAF undated, p. 45). Permits are required for river crossing structures, bulkheads, land development adjacent to the river, and water withdrawals (LDAF undated, p. 45).

Additional protected areas of Pearl River map turtle habitat in Louisiana include the Pearl River Wildlife Management Area located in St. Tammany Parish and Bogue Chitto State Park located on the Bogue Chitto River in Washington Parish. A master plan for management of Wildlife Management Areas and State Refuges has been developed for Louisiana, which describes the role of these lands in improving wildlife populations and their habitats, including identifying and prioritizing issues threatening wildlife resources (LDWF and The Conservation Fund 2014, entire). Bogue Chitto State Park is managed by the Louisiana Department of Culture, Recreation, and Tourism for public use.

The Louisiana State Comprehensive Wildlife Action Plan was developed as a roadmap for nongame conservation in Louisiana (Holcomb et al. 2015, entire). The primary focus of the plan is the recovery of ''species of greatest conservation need'' (SGCN), those wildlife species in need of conservation action within Louisiana, which includes the Pearl River map turtle. Specific actions identified for the Pearl River map turtle include conducting ecological studies of the turtle's reproduction, nest success, and recruitment, as well as developing general population estimates via mark and recapture studies (Holcomb et al. 2015, p. 69). Recent Pearl River map turtle survey work in Louisiana was conducted using funding from the State Wildlife Grants (SWG) program (Selman 2020a, entire).

Gravel mining activities that occur within Louisiana require review and permits by Louisiana Department of Environmental Quality. Additional permits are required by LDWF for any mining activities that occur within designated scenic streams in Louisiana. The permit requirements ensure all projects are reviewed and approved by the State, thus ensuring oversight by the State and application of State laws.

Mississippi

The Pearl River map turtle is ranked as S2 (imperiled because of rarity or because of some factor making it very vulnerable to extinction) in Mississippi (Mississippi Museum of Natural Science (MMNS) 2015, p. 38) but is not listed on the Mississippi State list of protected species (Mississippi Natural Heritage Program 2015, entire). Protections under State law are limited to licensing restrictions for take for personal use of nongame species in need of management (which includes native species of turtles). A Mississippi resident is required to obtain one of three licenses for capture and possession of Pearl River map turtles (Mississippi Commission on Wildlife, Fisheries, and Parks, Mississippi Department of Wildlife, Fisheries, and Parks (MDWFP) 2016, pp. 3–5). The three licenses available for this purpose are a Sportsman License, an All-Game Hunting/Freshwater Fishing License, and a Small Game Hunting/Freshwater Fishing License. A nonresident would require a Nonresident All Game Hunting License. Restrictions on take for personal use include that no more than four turtles of any species or subspecies may be possessed or taken within a single year and that no turtles may be taken between April 1 and June 30 except by permit from the MDWFP (Mississippi Commission on Wildlife, Fisheries, and Parks, MDWFP 2016, pp. 3–5; see also title 40 of the Mississippi Administrative Code at part 5, rule 2.3 (''Regulations Regarding Non-game Wildlife in Need of Management'')). Additional restrictions apply to this species if removed from the wild; non-game wildlife or their parts taken from wild Mississippi populations may not be bought, possessed, transported, exported, sold, offered for sale, shipped, bartered, or exhibited for commercial purposes.

The Mississippi Comprehensive Wildlife Action Plan (MMNS 2015, entire) was developed to provide a guide for effective and efficient long-term conservation of biodiversity in Mississippi. As in Louisiana, the primary focus of the plan is on the recovery of species designated as SGCN, which includes the Pearl River map turtle. Specific actions identified for the Pearl River map turtle in Mississippi include planning and conducting status surveys for the species (MMNS 2015, p. 686).

Lands managed for wildlife by the State of Mississippi, which may provide habitat protections for the Pearl River map turtle, include the Old River Wildlife Management Area in Pearl River County and the Pearl River Wildlife Management Area in Madison County. In addition, a ringed map turtle sanctuary was designated in 1990 by the Pearl River Valley Water Supply District (District), north of the Ross Barnett Reservoir, Madison County, which also provides habitat for the Pearl River map turtle. One of the goals of management on Wildlife Management Areas in Mississippi is to improve wildlife populations and their habitats (MDWFP 2020, entire). The District sanctuary is approximately 12 river miles (rmi) (19.3 river kilometer (rkm)) north from Ratliff Ferry to Lowhead Dam on the Pearl River (Service 2010, p. 4). Within the sanctuary, the District maintains informational signs to facilitate public awareness of the sanctuary and of the importance of the area to the species and conducts channel maintenance by methods that do not hinder the propagation of the species. The District has recorded a notation on the deed of the property comprising the sanctuary area that will in perpetuity notify transferees that the sanctuary must be maintained in accordance with the stated provisions (Service 2010, p. 4).

Additionally, gravel mining activities that occur within Mississippi require review and permits by Mississippi Department of Environmental Quality. The permit requirements ensure all projects are reviewed and approved by the State, thus ensuring oversight by the State and application of State laws.

*U.S. Fish and Wildlife State Wildlife Grants*

In 2000, the State Wildlife Grants (SWG) Program was created through the Fiscal Year 2001 Interior Appropriations Act (Pub. L. 106–291) and provided funding to States for the development and implementation of programs for the benefit of wildlife and their habitat, including species that are not hunted or fished. The SWG Program is administered by the Service and allocates Federal funding for proactive nongame conservation measures

nationwide. Congress stipulated that each State fish and wildlife agency that wished to participate in the SWG program develop a Wildlife Action Plan to guide the use of SWG funds (see discussion above regarding the plans developed by the States of Louisiana and Mississippi). This program funds studies that assist conservation by providing needed information regarding the species or its habitat and has contributed to the conservation of the species by assessing the current status and range of the Pearl River map turtle.

Additional Conservation Measures—Forest Management Best Management Practices

Most of the land adjacent to the Pearl River and Bogue Chitto River in Louisiana and Mississippi is privately owned and much of it is managed for timber. Both States have developed voluntary best management practices (BMPs) for forestry activities conducted in their respective States with the intent to protect water quality and minimize the impacts to plants and wildlife. In addition, the forest industry has several forest certification programs, such as the Sustainable Forestry Initiative, which require participating landowners to meet or exceed State forestry BMPs. Silvicultural practices implemented with State-approved BMPs can reduce negative impacts to aquatic species, including turtles, through reductions in nonpoint source pollution, such as sedimentation. Although nonpoint source pollution is a localized threat to the Pearl River map turtle, it is less prevalent in areas where State-approved BMPs are used (Service 2023, pp. 41–42).

In Louisiana, BMPs include streamside management zones (SMZ) of 50 ft (15.24 m), measured from the top of the streambank, for streams less than 20 ft (6.1 m) wide during estimated normal flow, to a width of 100 ft (30.5 m) for streams more than 20 ft (6.1 m) wide (LDAF undated, p. 15). Guidance includes maintaining adequate forest canopy cover for normal water and shade conditions as well as an appropriate amount of residual cover to minimize soil erosion (LDAF undated, p. 14). An overall rate of 97.4 percent of 204 forestry operations surveyed by the LDAF in 2018 complied with the State's voluntary guidelines; compliance with guidelines in SMZs was 98.6 percent (LDAF 2018, entire).

The State of Mississippi has voluntary BMPs developed by the Mississippi Forestry Commission (MFC) (MFC 2008, entire). These BMPs include SMZs with the purpose of maintaining bank stability and enhancing wildlife habitat by leaving 50 percent crown cover during timber cuts (MFC 2008, p. 6). The width of SMZs is based on slope, with a minimum SMZ width of 30 ft (9.14 m) extending to 60 ft (18.3 m) at sites with more than 40 percent slope (MFC 2008, p. 6). The most recent monitoring survey of 174 Mississippi forestry sites indicated that 95 percent of applicable sites were implemented in accordance with the 2008 guidelines (MFC 2019, p. 6).

Overall, voluntary BMPs related to forest management activities conducted on private lands throughout the riparian corridor of the Pearl River drainage have provided a significant foothold for Pearl River map turtle conservation. As a result of high BMP compliance in these specific areas, nonpoint source pollution associated with forest management practices is not a major contributor to impacts on the species.

*Cumulative/Synergistic Effects*

The Pearl River map turtle uses both aquatic and terrestrial habitats that may be affected by activities along the Pearl River drainage. Ongoing and future stressors that may contribute to cumulative effects include habitat fragmentation, genetic isolation, invasive species, disease, climate change, and impacts from increased human interactions due to human population increases. When considering the compounding and synergistic effects acting on the species, the resiliency of the analysis units will be further reduced in the future.

We note that, by using the SSA framework to guide our analysis of the scientific information documented in the SSA report, we have analyzed the cumulative effects of identified threats and conservation actions on the species. To assess the current and future condition of the species, we evaluate the effects of all the relevant factors that may be influencing the species, including threats and conservation efforts. Because the SSA framework considers not just the presence of the factors, but to what degree they collectively influence risk to the entire species, our assessment integrates the cumulative effects of the factors and replaces a standalone cumulative-effects analysis.

*Current Condition*

The current condition of the Pearl River map turtle is described in terms of population resiliency, redundancy, and representation across the species. The analysis of these conservation principles to understand the species' current viability is described in more detail in the Pearl River map turtle SSA report (Service 2023, pp. 43–69) and in the proposed listing rule (86 FR 66624; November 23, 2021).

Resiliency

In order to analyze the species' resiliency, we delineated the species into five resiliency units that represent groups of interbreeding individuals: Upper Pearl, Middle Pearl-Silver, Middle Pearl-Strong, Bogue Chitto, and Lower Pearl (figure 1, below). Historically, the majority of the species' range was likely a single, connected biological population prior to the fragmentation due to the construction of the Ross Barnett Reservoir; however, we delineated five different units to more accurately describe trends in resiliency, forecast future resiliency, and capture differences in stressors between the units.

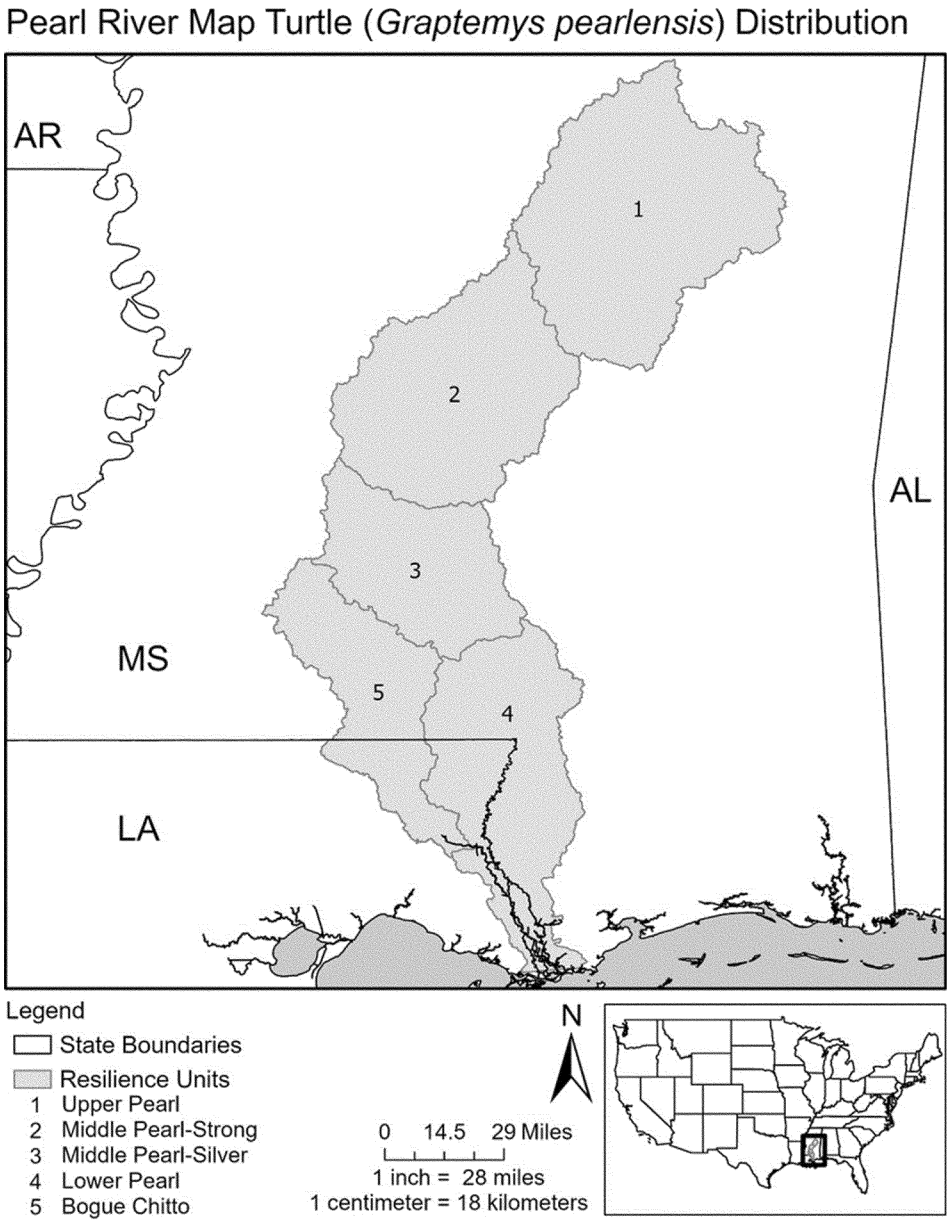


Figure 1. Pearl River map turtle range map distributed across the Pearl River basin. A total of one population within five resilience units (HUC–8 watersheds) is currently considered extant.

The factors used to assess current resiliency of Pearl River map turtle resilience units include two population factors and four habitat factors. The population factors we assessed were (1) occupancy in mainstems and tributaries and (2) density and abundance. The habitat factors we assessed were (a) water quality, (b) forested riparian cover, (c) protected land, and (d) presence of channelization/reservoirs/gravel mining. These population and habitat factors are collectively described as resiliency factors.

For a given population to be resilient, the species must be present in the mainstem and a high proportion of tributaries within a unit, as well as having moderate to high population densities. Furthermore, although relative abundance of the Pearl River map turtle is typically much higher within mainstem reaches, presence of the species within tributary systems can contribute to resiliency by increasing the number of occupied miles of stream within a given unit, and also by providing refugia from catastrophic events, such as chemical spills or flooding. In order to assess occupied tributaries, we used survey data collected from 2005–2020. These data were collected by several different observers through a variety of survey types, including bridge surveys, basking surveys, and live trapping.

The influence of stochastic variation in demographic (reproductive and mortality) rates is much higher for small populations than large ones. For small populations, this stochastic variation in demographic rates can lead to a greater probability that fluctuations will lead to extinction. There are also genetic

concerns with small populations, including reduced availability of compatible mates, genetic drift, and low genetic diversity or inbreeding depression. Small populations of Pearl River map turtles inherently have low resilience, leaving them particularly vulnerable to stochastic events. In 2020, the global population was estimated to be 21,841 individuals, with 61 percent occurring on mainstem reaches, 34 percent occurring in 4 large tributaries, and the remaining 5 percent spread amongst other smaller tributaries (Lindeman et al. 2020, p. 174). Based on basking density surveys and on results of point counts, each river drainage was divided into river reaches that were categorized as high, moderate, low, and very low density (Service 2023, p. 50).

After determining the occupied status of mainstem reaches and tributaries, and the density classes of the mainstem reaches and tributaries, the population factor score for each resilience unit resulted in three moderate (Bogue Chitto, Middle Pearl-Strong, and Upper Pearl) and two low (Lower Pearl and Middle-Pearl Silver) conditions. The overall habitat factor score for each resiliency unit resulted in low condition for two units (Bogue Chitto and Lower Pearl) and moderate condition for three units (Middle Pearl-Silver, Middle Pearl-Strong, and Upper Pearl). Additional details and methodologies for determining each habitat condition score are described in the SSA report (Service 2023, pp. 51–64).

After evaluating the population and habitat factors together, we determined the overall current resiliency of each unit: two units have low resiliency (Middle Pearl-Silver and Lower Pearl), and three units have moderate resiliency (Bogue Chitto, Middle Pearl-Strong, and Upper Pearl) (table 1, below). The Lower Pearl unit seems particularly vulnerable, as both the population and habitat composite scores were low. The Lower Pearl has significant channelization issues, low amounts of protected land, and a low density of individual turtles, all of which are driving the low resilience of this unit. Although the Middle Pearl-Silver unit scored moderate for overall habitat score, the low population score (mainly a function of the lack of occupied tributaries) is driving the low resilience of this unit. Additional details and methodologies for determining the overall current resiliency of each unit are described in the SSA report (Service 2023, pp. 45–66).

When looking at the three units with moderate resiliency, the Middle Pearl-Strong and Bogue Chitto units appear to be vulnerable to further decreases in resiliency. For the Bogue Chitto unit, moderate densities of Pearl River map turtle populations are present within 40 percent of surveyed (occupied) tributaries, although low amounts of protected land and substantial gravel mining activity make this unit vulnerable. For the Middle Pearl-Strong, moderate population densities are present within 50 percent of surveyed tributaries, but development in the Jackson area and the presence of the Ross Barnett Reservoir make this unit vulnerable. If development increases substantially in this unit, or if proposed reservoir projects (One Lake) move forward, it is likely there would be population-level impacts that would drop the resiliency to low in the future conditions.

TABLE 1—CURRENT RESILIENCY OF PEARL RIVER MAP TURTLE UNITS BASED ON COMPOSITE HABITAT AND POPULATION FACTORS

| Resiliency unit | Composite habitat score | Composite population score | Current resilience |
|---|---|---|---|
| Bogue Chitto | Low | Moderate | Moderate. |
| Lower Pearl | Low | Low | Low. |
| Middle Pearl-Silver | Moderate | Low | Low. |
| Middle Pearl-Strong | Moderate | Moderate | Moderate. |
| Upper Pearl | Moderate | Moderate | Moderate. |

Redundancy

Redundancy refers to the ability of a species to withstand catastrophic events and is measured by the amount and distribution of sufficiently resilient populations across the species' range. Catastrophic events that could severely impact or extirpate entire Pearl River map turtle units include chemical spills, changes in upstream land use that alter stream characteristics and water quality downstream, dam construction with a reservoir drowning lotic river habitat and further fragmenting contiguous aquatic habitat, and potential effects of climate change such as rising temperatures and SLR.

The Middle Pearl-Silver unit is the most vulnerable to a catastrophic land-based spill due to transportation via train or automobile, and there are no known occupied tributaries at this time. However, across the range of the Pearl River map turtle, extant units of the species are distributed relatively widely, and several of those units have moderate resilience; thus, it is highly unlikely that a catastrophic event would impact the entire species' range. As the species occurs in multiple tributaries and all units, the Pearl River map turtle has a high potential of withstanding catastrophic events; therefore, the species exhibits a moderate-high degree of redundancy.

Representation

Representation refers to the breadth of genetic and environmental diversity within and among populations that allows for adaptive capacity of the species; this influences the ability of a species to adapt to changing environmental conditions over time. Differences in life-history traits, habitat features, and/or genetics across a species' range often aid in the delineation of representative units, which are used to assess species representation. The species is described as consisting of a single representative unit due to the lack of genetic structuring across the range; the limited genetic diversity may reduce the ability of the species to adapt to changing conditions (Pearson et al. 2020, entire). However, there are habitat differences for the Strong River and we recognize the potential importance of that system to the adaptive capacity of the species.

In summary, the current condition of the Pearl River map turtle is described using resiliency, redundancy, and representation. We assessed current resiliency as a function of two population factors (occupied tributaries and density) and four habitat factors (water quality, protected areas, deadwood abundance, and reservoirs/channelization) for each resiliency unit. Based on these factors, there are two units with low resiliency (Lower Pearl and Middle Pearl-Silver) and three units with moderate resiliency (Upper Pearl, Middle Pearl-Strong, and Bogue Chitto); no units were assessed as highly resilient. Because three of the five units are classified as moderately resilient,

and those units are distributed relatively widely, the Pearl River map turtle exhibits a moderate-high degree of redundancy (*i.e.,* it has a high potential of withstanding catastrophic events). Even with the unique habitat in the Strong River, we recognize only a single representative unit based on low genetic variation. The wide distribution within the five resilience units across the range provides sufficient adaptive capacity to adapt to changing environmental conditions.

*Future Conditions*

The viability of the Pearl River map turtle in the future is based on the threats that are acting on the species and the species' response to those threats in light of conservation efforts or other actions that may benefit the species or its habitat. We consider plausible scenarios using the best available scientific and commercial data for developing each scenario. We describe the future conditions of the species by forecasting the species' response to plausible future scenarios of varying environmental conditions and ameliorating conservation efforts, and then considered the impact these influences could have on the viability of the Pearl River map turtle. The scenarios described in the SSA report represent six plausible future conditions for the species (Service 2023, pp. 74–76). The scenarios include land use changes and SLR in a matrix to determine the effects of both factors to each unit. We then considered future water engineering projects for each matrix and determined the resiliency of each unit based on whether the project is installed or not. All six scenarios were projected out to two different time steps: 2040 (~20 years) and 2070 (~50 years). These timeframes are based on input from species experts, generation time for the species, and the confidence in predicting patterns of urbanization and agriculture. Confidence in how these land uses will interact with the species and its habitat diminishes beyond 50 years. The scenarios only considered threats for which there were available data. We assume that other threats will continue, such as collection from the wild and impacts from climate change.

We continue to apply the concepts of resiliency, redundancy, and representation to the future scenarios to describe possible future conditions of the Pearl River map turtle and understand the overall future viability of the species. When assessing the future, viability is not a specific state, but rather a continuous measure of the likelihood that the species will sustain populations in the wild over time.

Using the best available information regarding the factors influencing the species' viability in the future, we considered the following factors to inform the future resiliency of the five units: (1) changes in land use/water quality, (2) SLR, and (3) future water engineering projects.

We considered projected land-use changes related to agricultural and developed land in assessing future resilience of each unit for the Pearl River map turtle. We consider these land use classes as surrogates for potential changes in water quality, a primary risk factor for the species. We used data available at the resiliency unit scale from the U.S. Geological Survey (USGS) Forecasting Scenarios of Land-use Change (FORE–SCE) modelling framework (USGS 2017, unpaginated) to characterize nonpoint source pollution (*i.e.,* from development and agriculture). The FORE–SCE model provides spatially explicit historical, current, and future projections of land use and land cover. Four scenarios were modeled, corresponding to four major scenario storylines from the Intergovernmental Panel on Climate Change (IPCC) Special Report on Emissions Scenarios (SRES) (IPCC 2000, pp. 4–5). The global IPCC SRES (A1B, A2, B1, and B2 scenarios) were downscaled to ecoregions in the conterminous United States with the USGS FORE–SCE model used to produce landscape projections consistent with the IPCC SRES. The land-use scenarios focused on socioeconomic impacts on anthropogenic land use (*e.g.,* demographics, energy use, agricultural economics, and other socioeconomic considerations). For the A1B, A2, B1, and B2 scenarios, we used two time steps (2040 and 2070), with the A2-Extreme-One Lake project scenarios representing the highest threat scenario, the B1-Intermediate High-No One Lake project scenario the lowest threat scenario, and the other four scenarios representing moderate threat scenarios.

Sea-level rise impacts the future resiliency of Pearl River map turtles directly through loss/degradation of habitat. To estimate habitat loss/degradation due to inundation from SLR, we used National Oceanic and Atmospheric Administration (NOAA) shapefiles available at their online SLR viewer (NOAA 2020, unpaginated). We used projections corresponding to the representative concentration pathways (RCP) of RCP6 (intermediate-high) and RCP8.5 (extreme). We found the average SLR estimate for the intermediate-high and extreme NOAA scenarios to project estimated habitat loss at years 2040 and 2070. If SLR estimates overlap with known occupied portions of the river system, we assume that area is no longer suitable or occupiable; thus, resiliency would decrease.

SLR is occurring, but the rate at which it continues is dependent on the different atmospheric emissions scenarios. In the next 20 years, sea levels are estimated to rise 1 ft (0.30 m) to 2 ft (0.61 m), and by 2070, a 3-ft (0.91-m) to 5-ft (1.52-m) rise in sea levels is projected for the lower and higher emissions scenarios. The effects of SLR and saltwater intrusion are exacerbated with storm surge and high tides. Pulses of saltwater from increased storm frequency and intensity, coupled with SLR, can have direct effects on freshwater habitats and species that are not salt-tolerant.

As noted above, water engineering projects that convert free-flowing rivers to lentic habitats negatively affect the species. The proposed One Lake project proposes a new dam and commercial development area 9 miles (mi) (14.5 kilometer (km)) south of the current Ross Barnett Reservoir Dam near Interstate 20. However, the One Lake project is still being debated, and there is uncertainty as to whether the project will proceed. Because of this uncertainty, we have created two scenarios based around the proposed One Lake project: One in which the project occurs, and one in which it does not, within the next 50 years. Because of the potential for negative impacts on Pearl River map turtles from the proposed One Lake project, we assume a decrease in resiliency of the Middle Pearl-Strong unit if the project moves forward.

We do not assess population factors (occupancy of tributaries and density) in our future conditions analysis because the data are not comparable through time or space; the baseline data come from recent surveys, and no historical data are available to allow for analyses of trends or comparisons over time. Additionally, we assume the amount of protected land within each unit stays the same within our projection timeframes, although it is possible that additional land could be converted to a protected status or lands could degrade over time. Rather than attempting to categorize future resiliency as was done in the current condition analysis, we indicate a magnitude and direction of anticipated change in resiliency of Pearl River map turtle units.

Scenario Descriptions

Scenarios were built around three factors: land use, SLR, and water

engineering projects. To present plausible future conditions for the species and to assess the viability for the Pearl River map turtle in response to those conditions, we projected two land use and two SLR scenarios out to the years 2040 (~20 years) and 2070 (~50 years). Additional details regarding the scenario descriptions can be found in the SSA report (Service 2023, pp. 73–75) and the proposed listing rule (86 FR 66624; November 23, 2021).

Future Resiliency

*Bogue Chitto*—Under all scenarios, development remains low across the Bogue Chitto unit. Agriculture is high across the entire unit in all scenarios, except for the B1 scenario in the year 2070, where agriculture is moderate. Forested cover is relatively high across the unit under all scenarios; thus, deadwood does not appear to be a limiting factor. There are no predicted SLR impacts or water engineering projects directly affecting this unit. There is uncertainty regarding future impacts related to mining activity, which has the potential to further reduce resiliency. However, the effects of past and current mining activities have already altered the Bogue Chitto by degrading both habitat and water quality (Service 2023, p. 31). It is likely that this unit maintains a moderate resilience over the next 50 years according to all future scenarios.

*Lower Pearl*—SLR impacts this unit under all scenarios, although the impacts of inundation are localized to the southern portion of the unit, mainly in the East Pearl River. Under the A2 scenarios, a few streams are impacted by high levels of development, although most of the unit has low levels of development; under the B1 scenarios, development is low across the entire unit. Agriculture is predicted to be high across the unit under the A2 scenarios, and moderate across the unit under the B1 scenarios. There are no predicted water engineering projects, and forested cover is anticipated to remain relatively high. Current resiliency for this unit is low, and resiliency is anticipated to decline across all scenarios, with the A2 scenarios with extreme SLR associated with the most substantial decreases.

*Middle Pearl-Silver*—Development remains low across the unit under all scenarios at both time steps. Agriculture increases to high under the A2 scenarios and stays moderate under the B1 scenarios. There are no predicted SLR effects or water engineering project impacts on this unit. Forested cover is relatively high across the unit under all scenarios and is predicted to increase under the B1 scenarios; thus, deadwood does not appear to be a limiting factor. Current resilience for this unit is low, and based on the factors assessed, it is likely there will not be a decline in resilience in the future (Service 2023, p. 93).

*Middle Pearl-Strong*—Development is substantial in a few areas within this unit, particularly around Jackson, Mississippi. The current resiliency for this unit is moderate, and the future resiliency is likely to decline due to increased agriculture and decreased forest cover within the unit (without One Lake). Agriculture is predicted to be high across the unit under all scenarios. If the One Lake project moves forward, there is a substantial decrease in resiliency predicted within and adjacent to the project area, as several streams are predicted to lose a substantial amount of forested cover. However, these impacts from the One Lake project will not extend to the Strong River as this tributary connects with the Pearl River downstream of the proposed project area. No SLR impacts are predicted in this unit. The Middle Pearl-Strong unit is perhaps the most vulnerable unit, as development, agriculture, and water engineering projects are projected to impact this unit and lead to future declines in resiliency.

*Upper Pearl*—The habitat associated with this unit provides conditions to potentially support a stronghold for the species because it has the largest total area of protected lands compared to the other four units (Service 2023, p. 61). Development remains low across the entire unit under all scenarios. Agriculture is high across the entire unit in all scenarios, except for the B1 scenario in the year 2070, where agriculture is moderate. Forested cover is relatively high across the unit under all scenarios; thus, deadwood does not appear to be a limiting factor. There are no predicted SLR or water engineering project impacts in this unit. The Upper Pearl unit will remain in the moderate category over the next 50 years, based on the factors assessed; however, this population may experience genetic drift over time due to isolation caused by habitat fragmentation from the existing (Ross Barnett) and planned (One Lake) reservoirs in the adjacent (downstream) unit. This will likely result in a decline in resiliency due to a loss of connectivity with the rest of the turtle's range.

Future Redundancy

Although the scenarios do not project extirpation in any of the units, we do anticipate resiliency to decline in four units; however, only the Middle Pearl-Strong unit will be downgraded from moderate to low resiliency under all scenarios in which the One Lake project is built. All other units will stay within the same (*i.e.,* current) resiliency category but will decline in resiliency within their respective categories. For example, the Lower Pearl unit will be impacted by SLR under all scenarios, and this is compounded by projected increases in both development and agriculture, but resiliency is expected to remain low. Only the Middle Pearl-Silver unit will not show any decline in resiliency into the future. Because extant units of the species are predicted to be distributed relatively widely, it is highly unlikely that a catastrophic event would impact the entire species' range; thus, the Pearl River map turtle is predicted to exhibit a moderate degree of redundancy in the future under all scenarios.

Future Representation

As described above under the current conditions, the species is a single representative unit regarding genetic variation. Relatively unique habitat conditions in the Strong River may influence the species' adaptive capacity and its overall representation. When looking at projections of threats within the Strong River, development is projected to remain low. In the A2 climate scenarios, agriculture increases from moderate to high; in the B1 climate scenarios, agriculture stays moderate. Also, forested cover within the riparian zone of the Strong River remains relatively high (68–83 percent), although it does drop across all climate scenarios from the current condition (92 percent). SLR does not impact this river in any of our scenarios, as the Strong River is far enough inland to avoid the effects of inundation. Finally, the One Lake project is not anticipated to directly impact the Strong River due to the location of the project (*i.e.,* mainstem Pearl River). Given this information, although the resiliency of the Strong River might decrease slightly due to land use projections, it is likely the Strong River will support a moderate density of individual turtles, and thus contribute to representation through maintenance of potential genetic diversity based on unique habitat features.

It is noteworthy that a recent genetics study has revealed that genetic diversity is lower in Pearl River map turtles compared to the closely related congener, Pascagoula map turtles (Pearson et al. 2020, pp. 11–12). Declining populations generally have reduced genetic diversity, which can potentially elevate the risk of extinction by reducing a species' ability and

potential to adapt to environmental changes (Spielman et al. 2004, entire). Genetic bottlenecks and low overall genetic diversity are more of a concern for populations that become geographically isolated by physical barriers that inhibit connectivity. Although no documented genetic differentiation has occurred, limited gene flow and genetic isolation of Pearl River map turtle populations upstream and downstream of the Ross Barnett Reservoir is expected to occur over future generations.

**Determination of Pearl River Map Turtle's Status**

Section 4 of the Act (16 U.S.C. 1533) and its implementing regulations (50 CFR part 424) set forth the procedures for determining whether a species meets the definition of an endangered species or a threatened species. The Act defines an ''endangered species'' as a species in danger of extinction throughout all or a significant portion of its range, and a ''threatened species'' as a species likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range. The Act requires that we determine whether a species meets the definition of endangered species or threatened species because of any of the following factors: (A) The present or threatened destruction, modification, or curtailment of its habitat or range; (B) overutilization for commercial, recreational, scientific, or educational purposes; (C) disease or predation; (D) the inadequacy of existing regulatory mechanisms; or (E) other natural or manmade factors affecting its continued existence.

*Status Throughout All of Its Range*

After evaluating threats to the species and assessing the cumulative effect of the threats under the Act's section 4(a)(1) factors, we determined that the species currently has sufficient resiliency, redundancy, and representation contributing to its overall viability across its range. Even though the species is described as a single population, we assessed its viability by evaluating the condition of the Pearl River map turtle in five different resiliency units. This assessment indicated that the current condition of all units is below optimal or high resiliency, with three units having moderate resiliency and the remaining two units having low resiliency. There are no units within the range that demonstrate high resiliency. Despite the moderate and low conditions of all units, the species still occupies all five units. Current threats to the species include habitat degradation or loss (degraded water quality, channel and hydrologic modifications/impoundments, agricultural runoff, mining, and development), collection for the pet trade, and effects of climate change (increasing temperatures, drought, sea-level rise, hurricane regime changes, and increased seasonal precipitation).

The Ross Barnett Reservoir was completed in 1963 and has reduced the amount of available habitat for the species and fragmented contiguous suitable habitat. Pearl River map turtles prefer flowing water in rivers and creeks. Indirect effects from the reservoir are associated with recreational use from boat traffic and foot traffic from day visitors and campers. Declines in Pearl River map turtles have been documented both upstream (lower density) and downstream (population declines) from the reservoir (Selman and Jones 2017, pp. 32–34). A total of 20.9 rmi (33.6 rkm) of the Pearl River is submerged beneath the Ross Barnett Reservoir and is no longer suitable for the Pearl River map turtle. This reservoir is currently affecting the Middle Pearl-Strong unit and the Upper Pearl unit, reducing the suitable habitat of 5 percent of the mainstem Pearl River by altering the lotic (flowing water) habitat preferred by Pearl River map turtles to lentic (lake) habitat. The reservoir reduces the resiliency and overall condition of these affected units.

Despite the effects of the existing reservoir on the Upper Pearl and Middle Pearl-Strong resilience units, sufficient habitat remains to provide adequate resiliency of these units to contribute to the viability of the species. The effects from the reservoir may continue affecting the species in the future as the turtles in the Upper Pearl unit (above the reservoir) become more isolated over time; however, there is currently adequate resiliency.

In terms of redundancy and the ability of the species to respond to catastrophic events, the species currently has enough redundancy across the five resilience units to protect it from a catastrophe such as a large hurricane or oil spill. The Middle Pearl-Silver and Middle Pearl-Strong units are particularly vulnerable to a potential spill from railways and transportation corridors that are near or adjacent to habitat occupied by Pearl River map turtles. The Lower Pearl unit is vulnerable to the effects from hurricanes as it is in close proximity to the Gulf of Mexico. However, because the species is a single population distributed across five resilience units encompassing 795.1 rmi (1279.6 rkm), it is buffered against catastrophic events such as these. The overall current condition of the species exhibits moderate-high redundancy, as the species is still widespread across its range in all resilience units across the single representative unit. Thus, after assessing the best available information, we conclude that the Pearl River map turtle is not currently in danger of extinction throughout all of its range.

A threatened species, as defined by the Act, is any species which is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range. Because the species is not currently in danger of extinction (*i.e.,* endangered) throughout its entire range, we evaluated the viability of the species over the foreseeable future considering the condition of the species in relation to its resiliency, redundancy, and representation. We analyzed future conditions (2040 and 2070) based on input from species experts, generation time for the species, and the confidence in predicting patterns of urbanization and agriculture, enabling us to make reasonably reliable predictions about the threats and the species' response to these threats over time.

The threats included in the future scenarios are projected to negatively affect the Pearl River map turtle and result in a decline of resiliency throughout four (Bogue Chitto, Lower Pearl, Middle Pearl-Strong, and Upper Pearl) of the five resilience units (Service 2023, pp. 70–105). While the Middle Pearl-Silver unit is not expected to see major declines in resiliency, its current resiliency is low and is anticipated to remain low in the future projections. None of the resilience units will improve from current conditions to provide high resiliency; three units are currently in moderate condition, but resiliency within these conditions decline in the future scenarios. Three resilience units may have additional stressors including isolation for the Upper Pearl, compounded by the addition of another planned reservoir for the Middle Pearl-Strong unit, and gravel mining for the Bogue Chitto unit. These threats will likely cause a decline in the amount of available suitable habitat, thereby affecting the future resiliency; however, the development of the reservoir and future sand and gravel mining activities are uncertain. Two of the resilience units are in low condition and are expected to remain in low condition in the future (Lower Pearl and Middle Pearl-Silver), with the southernmost unit (Lower Pearl) facing threats from SLR. The low genetic variability of Pearl River map turtles

may result in low adaptive capacity (the potential to adapt) to environmental or habitat changes within the units. More than half of the population inhabits the main stem river, which is subject to more catastrophic events (*e.g.,* an oil spill). These point source pollutants would flow downstream below the point of contamination, with greater impacts occurring in closer proximity to the spill. However, the mainstems of large, occupied tributaries (Bogue Chitto, Strong, Yockanookany) contain moderate densities of the Pearl River map turtle (34 percent of total population), which would allow for some rescue potential from tributaries to areas impacted by future catastrophic events.

In terms of resiliency, the future condition is expected to decline for all but one resilience unit. The future scenarios project out to the year 2070 to capture the species' response to threats and changing landscape conditions. The impacts from the existing Ross Barnett Reservoir will continue affecting the species, and resilience of the Middle Pearl-Strong unit will decline, and the turtle populations in the northernmost unit (Upper Pearl) will become even more spatially and genetically isolated over time. An additional planned development project (the One Lake project) downstream of the existing reservoir could affect up to 170 turtles directly and 360 turtles indirectly in the Middle Pearl-Strong unit (Selman 2020b, pp. 192–193). If this impoundment project moves forward, the species' viability will continue to decline in the foreseeable future as resiliency declines through loss of suitable habitat and further isolation of turtles above the reservoirs. The turtles in the Upper Pearl unit are subject to genetic isolation and potentially the effects of small population size as the species in this unit will not be connected to the rest of the contiguous habitat south of the reservoir.

Another future threat to the species is SLR, which will cause a contraction in the Lower Pearl unit as saline waters encroach upstream from the Gulf of Mexico, and the effects will be magnified with hurricane-related storm surge pulsing saline water upstream into the freshwater system. The amount of habitat affected over time depends on the rate of SLR and other factors that influence surge, such as increased hurricane or storm frequency and severity.

An additional threat that is expected to impact the species within the foreseeable future includes the continued collection from wild populations for the domestic and international pet trade. Map turtles are desired by collectors for their intricate shell patterns. Despite the less distinctive shell patterns and markings of adult Pearl River map turtles, the species remains a target for some herptile enthusiasts and personal collections. The demand for turtles globally is increasing, which results in more intense pressures on wild populations. The threat of illegal collection is expected to continue into the foreseeable future.

The overall future condition of the species is expected to continue a declining trajectory resulting in compromised viability as described in the future scenarios out to year 2070. Thus, after assessing the best available information, we conclude that the Pearl River map turtle is not currently in danger of extinction but is likely to become in danger of extinction within the foreseeable future throughout all of its range.

*Status Throughout a Significant Portion of Its Range*

Under the Act and our implementing regulations, a species may warrant listing if it is in danger of extinction or likely to become so within the foreseeable future throughout all or a significant portion of its range. The court in *Center for Biological Diversity* v. *Everson,* 435 F. Supp. 3d 69 (D.D.C. 2020) (*Everson*), vacated the provision of the Final Policy on Interpretation of the Phrase ''Significant Portion of Its Range'' in the Endangered Species Act's Definitions of ''Endangered Species'' and ''Threatened Species'' (Final Policy; 79 FR 37578, July 1, 2014) that provided if the Service determines that a species is threatened throughout all of its range, the Service will not analyze whether the species is endangered in a significant portion of its range.

Therefore, we proceed to evaluating whether the species is endangered in a significant portion of its range—that is, whether there is any portion of the species' range for which both (1) the portion is significant; and (2) the species is in danger of extinction in that portion. Depending on the case, it might be more efficient for us to address the ''significance'' question or the ''status'' question first. We can choose to address either question first. Regardless of which question we address first, if we reach a negative answer with respect to the first question that we address, we do not need to evaluate the other question for that portion of the species' range.

Following the court's holding in *Everson,* we now consider whether the species is in danger of extinction in a significant portion of its range. In undertaking this analysis for the Pearl River map turtle, we choose to address the status question first—we consider information pertaining to the geographic distribution of both the species and the threats that the species faces to identify any portions of the range where the species may be endangered.

We evaluated the range of the Pearl River map turtle to determine if the species is in danger of extinction now in any portion of its range. The range of a species can theoretically be divided into portions in an infinite number of ways. We focused our analysis on portions of the species' range that may meet the definition of an endangered species. For Pearl River map turtle, we considered whether the threats or their effects on the species are greater in any biologically meaningful portion of the species' range than in other portions such that the species is in danger of extinction now in that portion.

The statutory difference between an endangered species and a threatened species is the time frame in which the species becomes in danger of extinction; an endangered species is in danger of extinction now while a threatened species is not in danger of extinction now but is likely to become so within the foreseeable future. Thus, we reviewed the best scientific and commercial data available regarding the time horizon for the threats that are driving the Pearl River map turtle to warrant listing as a threatened species throughout all of its range. We then considered whether these threats or their effects are occurring (or may imminently occur) in any portion of the species' range with sufficient magnitude such that the species is in danger of extinction now in that portion of its range. We examined the following threats: effects of climate change (including SLR), habitat loss and degradation, and illegal collection. We also considered whether cumulative effects contributed to a concentration of threats across the species' range.

Overall, we found that the threat of SLR and habitat loss is likely acting disproportionately to particular areas within the species' range. The threat of SLR is concentrated in the Lower Pearl, which is the southernmost resilience unit that connects to the Gulf of Mexico. However, the salinity influx into the species' habitat due to SLR is not currently affecting this area but will affect the species' habitat within the foreseeable future. Thus, we have determined that SLR is not currently affecting this portion of the range to the extent that endangered status is warranted.

The threat of habitat loss and degradation is concentrated on the Middle Pearl-Strong and Upper Pearl units due to an existing reservoir and a planned project that disjoins the connectivity of turtles above and below the reservoir. The impacts due to habitat degradation and loss because of the existing reservoir are acting on the species' current condition and possibly future condition if the One Lake project is constructed as planned. The impacts from the One Lake project are in the future and are not currently affecting the species; therefore, we will only consider the existing reservoir for the analysis to determine if the species is endangered in a significant portion of its range.

After identifying areas where the concentration of threats of habitat degradation and loss affects the species or its habitat and the time horizon of these threats, we evaluated whether the species is endangered in the affected portion of the range. The area that currently contains a concentration of threats includes a portion of the Middle Pearl-Strong and Upper Pearl units. Habitat loss and degradation from an existing reservoir has reduced the amount and quality of existing habitat for the species in these units. The Ross Barnett Reservoir, constructed between 1960 and 1963 near Jackson, Mississippi, changed the natural hydrology of the Pearl River and resulted in 20.9 rmi (33.6 rkm) of river submerged and made unsuitable for the Pearl River map turtle (Lindeman et al. 2020, p. 173). Low population densities of turtles have been observed upstream from the reservoir (Selman and Jones 2017, pp. 32–34). Notable population declines also have been observed in the stretch of the Pearl River downstream of the Ross Barnett Reservoir (north of Lakeland Drive), but the exact reason for the decline is unknown (Selman 2020b, p. 194). However, despite these declines, the species can be found throughout the Pearl River downstream of the reservoir, and all size classes and moderate population densities have been observed in the mainstem and tributaries upstream of the reservoir. As a result, the Pearl River map turtle is not currently in danger of extinction in the portion of the range affected by the Barnett Ross Reservoir. We found no biologically meaningful portion of the Pearl River map turtle's range where threats are impacting individuals differently from how they are affecting the species elsewhere in its range, or where the biological condition of the species differs from its condition elsewhere in its range such that the status of the species in that portion differs from any other portion of the species' range. Therefore, no portion of the species' range provides a basis for determining that the species is in danger of extinction in a significant portion of its range, and we determine that the Pearl River map turtle is likely to become in danger of extinction within the foreseeable future throughout all of its range. This does not conflict with the courts' holdings in *Desert Survivors* v. *U.S. Department of the Interior,* 321 F. Supp. 3d 1011, 1070–74 (N.D. Cal. 2018) and *Center for Biological Diversity* v. *Jewell,* 248 F. Supp. 3d 946, 959 (D. Ariz. 2017) because, in reaching this conclusion, we did not apply the aspects of the Final Policy, including the definition of ''significant'' that those court decisions held to be invalid.

*Determination of Pearl River Map Turtle's Status*

Our review of the best scientific and commercial data available indicates that the Pearl River map turtle meets the Act's definition of a threatened species. Therefore, we are listing the Pearl River map turtle as a threatened species in accordance with sections 3(20) and 4(a)(1) of the Act.

**Available Conservation Measures**

Conservation measures provided to species listed as endangered or threatened species under the Act include recognition as a listed species, planning and implementation of recovery actions, requirements for Federal protection, and prohibitions against certain practices. Recognition through listing results in public awareness, and conservation by Federal, State, Tribal, and local agencies, private organizations, and individuals. The Act encourages cooperation with the States and other countries and calls for recovery actions to be carried out for listed species. The protection required by Federal agencies, including the Service, and the prohibitions against certain activities are discussed, in part, below.

The primary purpose of the Act is the conservation of endangered and threatened species and the ecosystems upon which they depend. The ultimate goal of such conservation efforts is the recovery of these listed species, so that they no longer need the protective measures of the Act. Section 4(f) of the Act calls for the Service to develop and implement recovery plans for the conservation of endangered and threatened species. The goal of this process is to restore listed species to a point where they are secure, self-sustaining, and functioning components of their ecosystems.

The recovery planning process begins with development of a recovery outline made available to the public soon after a final listing determination. The recovery outline guides the immediate implementation of urgent recovery actions while a recovery plan is being developed. Recovery teams (composed of species experts, Federal and State agencies, nongovernmental organizations, and stakeholders) may be established to develop and implement recovery plans. The recovery planning process involves the identification of actions that are necessary to halt and reverse the species' decline by addressing the threats to its survival and recovery. The recovery plan identifies recovery criteria for review of when a species may be ready for reclassification from endangered to threatened (''downlisting'') or removal from protected status (''delisting''), and methods for monitoring recovery progress. Recovery plans also establish a framework for agencies to coordinate their recovery efforts and provide estimates of the cost of implementing recovery tasks. Revisions of the plan may be done to address continuing or new threats to the species, as new substantive information becomes available. The recovery outline, draft recovery plan, final recovery plan, and any revisions will be available on our website as they are completed (*https://www.fws.gov/program/endangered-species*), or from our Mississippi Ecological Services Field Office (see **FOR FURTHER INFORMATION CONTACT**).

Implementation of recovery actions generally requires the participation of a broad range of partners, including other Federal agencies, States, Tribes, nongovernmental organizations, businesses, and private landowners. Examples of recovery actions include habitat restoration (*e.g.,* restoration of native vegetation), research, captive propagation and reintroduction, and outreach and education. The recovery of many listed species cannot be accomplished solely on Federal lands because their range may occur primarily or solely on non-Federal lands. To achieve recovery of these species requires cooperative conservation efforts on private, State, and Tribal lands.

Once the Pearl River map turtle is listed (see **DATES**, above), funding for recovery actions will be available from a variety of sources, including Federal budgets, State programs, and cost-share grants for non-Federal landowners, the academic community, and nongovernmental organizations. In addition, pursuant to section 6 of the Act, the States of Louisiana and Mississippi will be eligible for Federal

funds to implement management actions that promote the protection or recovery of the Pearl River map turtle. Information on our grant programs that are available to aid species recovery can be found at: *https://www.fws.gov/service/financial-assistance.*

Please let us know if you are interested in participating in recovery efforts for the Pearl River map turtle. Additionally, we invite you to submit any new information on this species whenever it becomes available and any information you may have for recovery planning purposes (see **FOR FURTHER INFORMATION CONTACT**).

Section 7 of the Act is titled, ''Interagency Cooperation'' and mandates all Federal agencies to use their existing authorities to further the conservation purposes of the Act and to ensure that their actions are not likely to jeopardize the continued existence of listed species or adversely modify critical habitat. Regulations implementing section 7 are codified at 50 CFR part 402.

Section 7(a)(2) states that each Federal action agency shall, in consultation with the Secretary, ensure that any action they authorize, fund, or carry out is not likely to jeopardize the continued existence of a listed species or result in the destruction or adverse modification of designated critical habitat. Each Federal agency shall review its action at the earliest possible time to determine whether it may affect listed species or critical habitat. If a determination is made that the action may affect listed species or critical habitat, formal consultation is required (50 CFR 402.14(a)), unless the Service concurs in writing that the action is not likely to adversely affect listed species or critical habitat. At the end of a formal consultation, the Service issues a biological opinion, containing its determination of whether the Federal action is likely to result in jeopardy or adverse modification.

Examples of discretionary actions for the Pearl River map turtle that may be subject to consultation procedures under section 7 are land management or other landscape-altering activities on Federal lands administered by the Service (Refuges) and Department of Defense (Stennis Western Maneuver Area) as well as actions on State, Tribal, local, or private lands that require a Federal permit (such as a permit from the U.S. Army Corps of Engineers under section 404 of the Clean Water Act (33 U.S.C. 1251 *et seq.*) or a permit from the Service under section 10 of the Act) or that involve some other Federal action (such as funding from the Federal Highway Administration, Federal Aviation Administration, or the Federal Emergency Management Agency). Federal actions not affecting listed species or critical habitat—and actions on State, Tribal, local, or private lands that are not federally funded, authorized, or carried out by a Federal agency—do not require section 7 consultation. Federal agencies should coordinate with the Field Supervisor of the Service's Mississippi Ecological Services Field Office (see **FOR FURTHER INFORMATION CONTACT**) with any specific questions on section 7 consultation and conference requirements.

It is the policy of the Services, as published in the **Federal Register** on July 1, 1994 (59 FR 34272), to identify to the extent known at the time a species is listed, specific activities that will not be considered likely to result in violation of section 9 of the Act. To the extent possible, activities that will be considered likely to result in violation will also be identified in as specific a manner as possible. The intent of this policy is to increase public awareness of the effect of a listing on proposed and ongoing activities within the range of the species. Although most of the prohibitions in section 9 of the Act apply to endangered species, sections 9(a)(1)(G) and 9(a)(2)(E) of the Act (16 U.S.C. 1538(a)(1)(G) and (a)(2)(E)) prohibit the violation of any regulation under section 4(d) pertaining to any threatened species of fish or wildlife, or threatened species of plant, respectively. Section 4(d) of the Act (16 U.S.C. 1533(d)) directs the Secretary to promulgate protective regulations that are necessary and advisable for the conservation of threatened species. As a result, we interpret our policy to mean that, when we list a species as a threatened species, to the extent possible, we identify activities that will or will not be considered likely to result in violation of the protective regulations under section 4(d) of the Act for that species.

At this time, we are unable to identify specific activities that will or will not be considered likely to result in violation of section 9 of the Act beyond what is already clear from the descriptions of prohibitions and exceptions established by protective regulation under section 4(d) of the Act.

Questions regarding whether specific activities would constitute violation of section 9 of the Act should be directed to the Field Supervisor of the Service's Mississippi Ecological Services Field Office (see **FOR FURTHER INFORMATION CONTACT**).

## II. Protective Regulations Under Section 4(d) of the Act for the Pearl River Map Turtle

### Background

Section 4(d) of the Act contains two sentences. The first sentence states that the Secretary shall issue such regulations as she deems necessary and advisable to provide for the conservation of species listed as threatened. Conservation is defined in the Act to mean the use of all methods and procedures which are necessary to bring any endangered species or threatened species to the point at which the measures provided pursuant to the Act are no longer necessary. Additionally, the second sentence of section 4(d) of the Act states that the Secretary may by regulation prohibit with respect to any threatened species any act prohibited under section 9(a)(1), in the case of fish or wildlife, or section 9(a)(2), in the case of plants. With these two sentences in section 4(d), Congress delegated broad authority to the Secretary to determine what protections would be necessary and advisable to provide for the conservation of threatened species, and even broader authority to put in place any of the section 9 prohibitions, for a given species.

The courts have recognized the extent of the Secretary's discretion under this standard to develop rules that are appropriate for the conservation of a species. For example, courts have upheld, as a valid exercise of agency authority, rules developed under section 4(d) that included limited prohibitions against takings (see *Alsea Valley Alliance* v. *Lautenbacher,* 2007 WL 2344927 (D. Or. 2007); *Washington Environmental Council* v. *National Marine Fisheries Service,* 2002 WL 511479 (W.D. Wash. 2002)). Courts have also upheld 4(d) rules that do not address all of the threats a species faces (see *State of Louisiana* v. *Verity,* 853 F.2d 322 (5th Cir. 1988)). As noted in the legislative history when the Act was initially enacted, ''once an animal is on the threatened list, the Secretary has an almost infinite number of options available to [her] with regard to the permitted activities for those species. [She] may, for example, permit taking, but not importation of such species, or [she] may choose to forbid both taking and importation but allow the transportation of such species'' (H.R. Rep. No. 412, 93rd Cong., 1st Sess. 1973).

The provisions of this species' protective regulations under section 4(d) of the Act are one of many tools that we will use to promote the conservation of

the Pearl River map turtle. Nothing in 4(d) rules change in any way the recovery planning provisions of section 4(f) of the Act, the consultation requirements under section 7 of the Act, or the ability of the Service to enter into partnerships for the management and protection of the Pearl River map turtle. As mentioned previously in Available Conservation Measures, Section 7(a)(2) of the Act requires Federal agencies, including the Service, to ensure that any action they authorize, fund, or carry out is not likely to jeopardize the continued existence of any endangered species or threatened species or result in the destruction or adverse modification of designated critical habitat of such species. These requirements are the same for a threatened species regardless of what is included in its 4(d) rule.

Section 7 consultation is required for Federal actions that ''may affect'' a listed species regardless of whether take caused by the activity is prohibited or excepted by a 4(d) rule (''blanket rule'' or species-specific 4(d) rule). A 4(d) rule does not change the process and criteria for informal or formal consultations and does not alter the analytical process used for biological opinions or concurrence letters. For example, as with an endangered species, if a Federal agency determines that an action is ''not likely to adversely affect'' a threatened species, this will require the Service's written concurrence (50 CFR 402.13(c)). Similarly, if a Federal agency determines that an action is ''likely to adversely affect'' a threatened species, the action will require formal consultation and the formulation of a biological opinion (50 CFR 402.14(a)).

**Provisions of the 4(d) Protective Regulations for the Pearl River Map Turtle**

Exercising the Secretary's authority under section 4(d) of the Act, we have developed a rule that is designed to address the Pearl River map turtle's conservation needs. As discussed previously under Summary of Biological Status and Threats, we have concluded that the Pearl River map turtle is likely to become in danger of extinction within the foreseeable future primarily due to habitat degradation and loss caused by degraded water quality, channel or hydrological modifications and impoundments, agricultural runoff, development, mining; collection; and climate change. Additional stressors acting on the species include disease and contaminants (pesticides and heavy metals). Drowning and/or capture due to bycatch associated with recreational and commercial fishing of some species of freshwater fish may also affect the Pearl River map turtle but are of unknown frequency or severity.

Section 4(d) requires the Secretary to issue such regulations as she deems necessary and advisable to provide for the conservation of each threatened species and authorizes the Secretary to include among those protective regulations any of the prohibitions that section 9(a)(1) of the Act prescribes for endangered species. We are not required to make a ''necessary and advisable'' determination when we apply or do not apply specific section 9 prohibitions to a threatened species (In re: Polar Bear Endangered Species Act Listing and 4(d) Rule Litigation, 818 F. Supp. 2d 214, 228 (D.D.C. 2011) (citing Sweet Home Chapter of Cmtys. for a Great Or. v. Babbitt, 1 F.3d 1, 8 (D.C. Cir. 1993), rev'd on other grounds, 515 U.S. 687 (1995))). Nevertheless, even though we are not required to make such a determination, we have chosen to be as transparent as possible and explain below why we find that the protections, prohibitions, and exceptions in this rule as a whole satisfy the requirement in section 4(d) of the Act to issue regulations deemed necessary and advisable to provide for the conservation of the Pearl River map turtle.

The protective regulations for Pearl River map turtle incorporate prohibitions from section 9(a)(1) of the Act to address the threats to the species. The prohibitions of section 9(a)(1) of the Act, and implementing regulations codified at 50 CFR 17.21, make it illegal for any person subject to the jurisdiction of the United States to commit, to attempt to commit, to solicit another to commit or to cause to be committed any of the following acts with regard to any endangered wildlife: (1) import into, or export from, the United States; (2) take (which includes harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect) within the United States, within the territorial sea of the United States, or on the high seas; (3) possess, sell, deliver, carry, transport, or ship, by any means whatsoever, any such wildlife that has been taken illegally; (4) deliver, receive, carry, transport, or ship in interstate or foreign commerce, by any means whatsoever and in the course of commercial activity; or (5) sell or offer for sale in interstate or foreign commerce. This protective regulation includes all of these prohibitions because the Pearl River map turtle is at risk of extinction in the foreseeable future and putting these prohibitions in place will help to better preserve the condition of the species' resilience units, slow its rate of decline, and decrease synergistic, negative effects from other ongoing or future threats.

In particular, this 4(d) rule will provide for the conservation of the Pearl River map turtle by prohibiting the following activities, unless they fall within specific exceptions or are otherwise authorized or permitted: importing or exporting; take; possession and other acts with unlawfully taken specimens; delivering, receiving, carrying, transporting, or shipping in interstate or foreign commerce in the course of commercial activity; or selling or offering for sale in interstate or foreign commerce.

Under the Act, ''take'' means to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct. Some of these provisions have been further defined in regulation at 50 CFR 17.3. Take can result knowingly or otherwise, by direct and indirect impacts, intentionally or incidentally. Regulating take will help preserve the species' remaining populations, slow their rate of decline, and decrease cumulative effects from other ongoing or future threats. Therefore, we are prohibiting take of the Pearl River map turtle, except for take resulting from those actions and activities specifically excepted by the 4(d) rule. Exceptions to the prohibition on take include the general exceptions to the prohibition on take of endangered wildlife, as set forth in 50 CFR 17.21 and additional exceptions, as described below.

Despite these prohibitions regarding threatened species, we may under certain circumstances issue permits to carry out one or more otherwise prohibited activities, including those described above. The regulations that govern permits for threatened wildlife state that the Director may issue a permit authorizing any activity otherwise prohibited with regard to threatened species. These include permits issued for the following purposes: for scientific purposes, to enhance propagation or survival, for economic hardship, for zoological exhibition, for educational purposes, for incidental taking, or for special purposes consistent with the purposes of the Act (50 CFR 17.32). The statute also contains certain exemptions from the prohibitions, which are found in sections 9 and 10 of the Act.

In addition, to further the conservation of the species, any employee or agent of the Service, any other Federal land management agency, the National Marine Fisheries Service, a State conservation agency, or a federally recognized Tribe, who is designated by their agency or Tribe for such purposes,

may, when acting in the course of their official duties, take threatened wildlife without a permit if such action is necessary to: (i) Aid a sick, injured, or orphaned specimen; or (ii) Dispose of a dead specimen; or (iii) Salvage a dead specimen that may be useful for scientific study; or (iv) Remove specimens that constitute a demonstrable but nonimmediate threat to human safety, provided that the taking is done in a humane manner; the taking may involve killing or injuring only if it has not been reasonably possible to eliminate such threat by live capturing and releasing the specimen unharmed, in an appropriate area.

We recognize the special and unique relationship that we have with our State natural resource agency partners in contributing to conservation of listed species. State agencies often possess scientific data and valuable expertise on the status and distribution of endangered, threatened, and candidate species of wildlife and plants. State agencies, because of their authorities and their close working relationships with local governments and landowners, are in a unique position to assist us in implementing all aspects of the Act. In this regard, section 6 of the Act provides that we must cooperate to the maximum extent practicable with the States in carrying out programs authorized by the Act. Therefore, any qualified employee or agent of a State conservation agency that is a party to a cooperative agreement with us in accordance with section 6(c) of the Act, who is designated by his or her agency for such purposes, will be able to conduct activities designed to conserve the Pearl River map turtle that may result in otherwise prohibited take without additional authorization.

The 4(d) rule will also provide for the conservation of the species by allowing exceptions that incentivize conservation actions or that, while they may have some minimal level of take of the Pearl River map turtle, are not expected to rise to the level that would have a negative impact (*i.e.,* would have only de minimis impacts) on the species' conservation. The exceptions to these prohibitions include take resulting from forest management practices that use State-approved best management practices (described below) that are expected to have negligible impacts to the Pearl River map turtle and its habitat.

*Silvicultural Practices and Forest Management Activities that Use State Forestry Best Management Practices*—Forest management practices that implement State-approved BMPs designed to protect water quality and stream and riparian habitat will avoid or minimize the effects of habitat alterations in areas that support Pearl River map turtles. We consider that certain activities associated with silvicultural practices and forest management activities may remove riparian cover or forested habitat, change land use within the riparian zone, or increase stream bank erosion and/or siltation. We recognize that forest management practices are widely implemented in accordance with State-approved BMPs (as reviewed by Cristan et al. 2018, entire), and the adherence to these BMPs broadly protects water quality, particularly related to sedimentation (as reviewed by Cristan et al. 2016, entire; Warrington et al. 2017, entire; and Schilling et al. 2021, entire), to an extent that does not impair the species' conservation. Forest landowners who properly implement those BMPs are helping conserve the Pearl River map turtle, and this 4(d) rule is an incentive for all landowners to properly implement applicable State-approved BMPs to avoid any take implications. Further, those forest landowners who are third-party-certified (attesting to the sustainable management of a working forest) to a credible forest management standard are providing audited certainty that BMP implementation is taking place across the landscape.

*Summary of Species-specific Incidental Take Exceptions in the 4(d) Rule*—Under this final 4(d) rule, incidental take associated silviculture practices and forest management activities that use State-approved BMPs designed to protect water quality and stream and riparian habitat with the following activities is excepted from the prohibitions.

## III. Critical Habitat for the Pearl River Map Turtle

### Background

Section 4(a)(3) of the Act requires that, to the maximum extent prudent and determinable, we designate a species' critical habitat concurrently with listing the species. Critical habitat is defined in section 3 of the Act as:

(1) The specific areas within the geographical area occupied by the species, at the time it is listed in accordance with the Act, on which are found those physical or biological features

(a) Essential to the conservation of the species, and

(b) Which may require special management considerations or protection; and

(2) Specific areas outside the geographical area occupied by the species at the time it is listed, upon a determination that such areas are essential for the conservation of the species.

Our regulations at 50 CFR 424.02 define the geographical area occupied by the species as an area that may generally be delineated around 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).

Conservation, as defined under section 3 of the Act, means to use all methods and procedures that are necessary to bring an endangered or threatened species to the point at which the measures provided pursuant to the Act are no longer necessary. Such methods and procedures include, but are not limited to, all activities associated with scientific resource management such as research, census, law enforcement, habitat acquisition and maintenance, propagation, live trapping, and transplantation, and, in the extraordinary case where population pressures within a given ecosystem cannot be otherwise relieved, may include regulated taking.

Critical habitat receives protection under section 7 of the Act through the requirement that each Federal action agency ensure, in consultation with the Service, that any action they authorize, fund, or carry out is not likely to result in the destruction or adverse modification of designated critical habitat. The designation of critical habitat does not affect land ownership or establish a refuge, wilderness, reserve, preserve, or other conservation area. Such designation also does not allow the government or public to access private lands. Such designation does not require implementation of restoration, recovery, or enhancement measures by non-Federal landowners. Rather, designation requires that, where a landowner requests Federal agency funding or authorization for an action that may affect an area designated as critical habitat, the Federal agency consult with the Service under section 7(a)(2) of the Act. If the action may affect the listed species itself (such as for occupied critical habitat), the Federal action agency would have already been required to consult with the Service even absent the critical habitat designation because of the requirement to ensure that the action is not likely to jeopardize the continued existence of the species. Even if the Service were to conclude after

consultation that the proposed activity is likely to result in destruction or adverse modification of the critical habitat, the Federal action agency and the landowner are not required to abandon the proposed activity, or to restore or recover the species; instead, they must implement ''reasonable and prudent alternatives'' to avoid destruction or adverse modification of critical habitat.

Under the first prong of the Act's definition of critical habitat, areas within the geographical area occupied by the species at the time it was listed are included in a critical habitat designation if they contain physical or biological features (1) which are essential to the conservation of the species and (2) which may require special management considerations or protection. For these areas, critical habitat designations identify, to the extent known using the best scientific and commercial data available, those physical or biological features that are essential to the conservation of the species (such as space, food, cover, and protected habitat).

Under the second prong of the Act's definition of critical habitat, we can designate critical habitat in areas outside the geographical area occupied by the species at the time it is listed, upon a determination that such areas are essential for the conservation of the species.

Section 4 of the Act requires that we designate critical habitat on the basis of the best scientific data available. Further, our Policy on Information Standards Under the Endangered Species Act (published in the **Federal Register** on July 1, 1994 (59 FR 34271)), the Information Quality Act (section 515 of the Treasury and General Government Appropriations Act for Fiscal Year 2001 (Pub. L. 106–554; H.R. 5658)), and our associated Information Quality Guidelines provide criteria, establish procedures, and provide guidance to ensure that our decisions are based on the best scientific data available. They require our biologists, to the extent consistent with the Act and with the use of the best scientific data available, to use primary and original sources of information as the basis for recommendations to designate critical habitat.

When we are determining which areas should be designated as critical habitat, our primary source of information is generally the information from the SSA report and information developed during the listing process for the species. Additional information sources may include any generalized conservation strategy, criteria, or outline that may have been developed for the species; the recovery plan for the species; articles in peer-reviewed journals; conservation plans developed by States and counties; scientific status surveys and studies; biological assessments; other unpublished materials; or experts' opinions or personal knowledge.

Habitat is dynamic, and species may move from one area to another over time. We recognize that critical habitat designated at a particular point in time may not include all of the habitat areas that we may later determine are necessary for the recovery of the species. For these reasons, a critical habitat designation does not signal that habitat outside the designated area is unimportant or may not be needed for recovery of the species. Areas that are important to the conservation of the species, both inside and outside the critical habitat designation, will continue to be subject to: (1) Conservation actions implemented under section 7(a)(1) of the Act; (2) regulatory protections afforded by the requirement in section 7(a)(2) of the Act for Federal agencies to ensure their actions are not likely to jeopardize the continued existence of any endangered or threatened species; and (3) the prohibitions found in the 4(d) rule. Federally funded or permitted projects affecting listed species outside their designated critical habitat areas may still result in jeopardy findings in some cases. These protections and conservation tools will continue to contribute to recovery of this species. Similarly, critical habitat designations made on the basis of the best available information at the time of designation will not control the direction and substance of future recovery plans, habitat conservation plans (HCPs), or other species conservation planning efforts if new information available at the time of these planning efforts calls for a different outcome.

**Prudency Determination**

Section 4(a)(3) of the Act, as amended, and implementing regulations (50 CFR 424.12) require that, to the maximum extent prudent and determinable, the Secretary shall designate critical habitat at the time the species is determined to be an endangered or threatened species. On April 5, 2024, we published a final rule revised our regulations at 50 CFR part 424 to further clarify when designation of critical habitat may not be prudent (89 FR 24300). Our regulations (50 CFR424.12(a)(1)) state that designation of critical habitat may not be prudent in circumstances such as, but not limited to, the following:

(i) The species is threatened by taking or other human activity and identification of critical habitat can be expected to increase the degree of such threat to the species;

(ii) The present or threatened destruction, modification, or curtailment of a species' habitat or range is not a threat to the species;

(iii) Areas within the jurisdiction of the United States provide no more than negligible conservation value, if any, for a species occurring primarily outside the jurisdiction of the United States; or

(iv) No areas meet the definition of critical habitat.

We found that designation of critical habitat was not prudent for the Pearl River map turtle in our November 23, 2021, proposed rule (86 FR 66624). We based this finding on a determination that the designation of critical habitat would increase the threat to the Pearl River map turtle from unauthorized collection and trade, and may further facilitate inadvertent or purposeful disturbance of the turtle's habitat. We stated that designation of occupied critical habitat is likely to confer only an educational benefit to the species beyond that provided by listing. Alternatively, the designation of unoccupied critical habitat for the Pearl River map turtle could provide an educational and at least some regulatory benefit for the species. However, we stated that the risk of increasing significant threats to the species by publishing more specific location information in a critical habitat designation greatly outweighed the benefits of designating critical habitat.

We received numerous comments from private and Federal entities stating that the locations of Pearl River map turtle are already available in scientific journals, online databases, and documents published by the Service, which led us to reconsider the prudency determination for these species. Our original determination rested on the increased risk of poaching resulting from publicizing the locations of Pearl River map turtle populations through maps of critical habitat in the **Federal Register**. In light of the comments we received during the November 23, 2021, proposed rule's comment period, we now find that designation of critical habitat is prudent for the Pearl River map turtle. Our rationale is outlined below. The principal benefit of including an area in critical habitat is the requirement for agencies to ensure actions they fund, authorize, or carry out are not likely to result in the destruction or adverse modification of

any designated critical habitat, the regulatory standard of section 7(a)(2) of the Act under which consultation is completed. Critical habitat provides protections only where there is a Federal nexus, that is, those actions that come under the purview of section 7 of the Act. Critical habitat designation has no application to actions that do not have a Federal nexus.

Section 7(a)(2) of the Act mandates that Federal agencies, in consultation with the Service, evaluate the effects of their proposed actions on any designated critical habitat. Similar to the Act's requirement that a Federal agency action not jeopardize the continued existence of listed species, Federal agencies have the responsibility not to implement actions that would destroy or adversely modify designated critical habitat. Federal actions affecting the species even in the absence of designated critical habitat areas will still benefit from consultation pursuant to section 7(a)(2) of the Act and may still result in jeopardy findings. However, the analysis of effects of a proposed project on critical habitat is separate and distinct from that of the effects of a proposed project on the species itself. The jeopardy analysis evaluates the action's impact to survival and recovery of the species, while the destruction or adverse modification analysis evaluates the action's effects to the designated habitat's contribution as a whole to conservation of the species. Therefore, the difference in outcomes of these two analyses represents the regulatory benefit of critical habitat. This would, in some instances, lead to different results and different regulatory requirements. Thus, critical habitat designations may provide greater benefits to the recovery of a species than would listing alone.

Map turtles are valuable to collectors and the threat of poaching remains imminent (Factor B) for the Pearl River map turtle. There is evidence that the designation of critical habitat could result in an increased threat from taking, specifically collection, for the species, through publication of maps and a narrative description of specific critical habitat units in the **Federal Register**. However, such information on locations of extant Pearl River map turtle populations is already widely available to the public through many outlets, as noted above. Therefore, identification and mapping of critical habitat is not expected to increase the degree of such threat. In the comments we received on the November 23, 2021, proposed rule, we were alerted to the existing public availability of many, if not all, populations or locations of the Pearl River map turtle.

**Critical Habitat Determinability**

Having determined that designation is prudent, under section 4(a)(3) of the Act we must find whether critical habitat for the Pearl River map turtle is determinable. Our regulations at 50 CFR 424.12(a)(2) state that critical habitat is not determinable when one or both of the following situations exist:

(i) Data sufficient to perform required analyses are lacking, or

(ii) The biological needs of the species are not sufficiently well known to identify any area that meets the definition of ''critical habitat.''

When critical habitat is not determinable, the Act allows the Service an additional year to publish a critical habitat designation (16 U.S.C. 1533(b)(6)(C)(ii)).

For the Pearl River map turtle, the species' needs are sufficiently well known, but a careful assessment of the economic impacts that may occur due to a critical habitat designation is ongoing. Until these efforts are complete, information sufficient to perform a required analysis of the impacts of the designation is lacking; therefore, we find the designation of critical habitat for the Pearl River map turtle to be not determinable at this time. In the future, we plan to publish a proposed rule to designate critical habitat for the Pearl River map turtle concurrent with the availability of a draft economic analysis of the proposed designation.

## IV. Similarity of Appearance for the Alabama Map Turtle, Barbour's Map Turtle, Escambia Map Turtle, and Pascagoula Map Turtle

Section 4(e) authorizes the treatment of a species, subspecies, or population segment as an endangered or threatened species if: (a) Such species so closely resembles in appearance, at the point in question, a species which has been listed pursuant to the Act that enforcement personnel would have substantial difficulty in attempting to differentiate between the listed and unlisted species; (b) the effect of this substantial difficulty is an additional threat to an endangered or threatened species; and (c) such treatment of an unlisted species will substantially facilitate the enforcement and further the policy of the Act (16 U.S.C. 1533(e)).

The treatment of a species as an endangered or threatened species due to similarity of appearance under section 4(e) of the Act does not extend other protections of the Act, such as consultation requirements for Federal agencies under section 7 and the recovery planning provisions under section 4(f), that apply to species that are listed as endangered or threatened species under section 4(a) of the Act. All applicable prohibitions and exceptions for species listed under section 4(e) of the Act due to similarity of appearance to an endangered or threatened species are set forth in a species-specific rule issued under section 4(d) of the Act. The Service implements this section 4(e) authority in accordance with the Act and our regulations at 50 CFR 17.50 through 17.52. Our analysis of the criteria for the 4(e) rule is described in the proposed rule (86 FR 66624; November 23, 2021) for the similarity of appearance of the Alabama map turtle, Barbour's map turtle, Escambia map turtle, and Pascagoula map turtle in relation to the threatened Pearl River map turtle.

*Do the Alabama map turtle, Barbour's map turtle, Escambia map turtle, and Pascagoula map turtle so closely resemble in appearance, at the point in question, the Pearl River map turtle such that enforcement personnel would have substantial difficulty in attempting to differentiate between the listed and unlisted species?*

Map turtles (genus *Graptemys*) are named for the intricate pattern on the carapace that often resembles a topographical map. In addition to the intricate markings, the shape of the carapace (top half of shell) in map turtles is very distinctive. The carapace is keeled, and many species show some type of knobby projections or spikes down the vertebral scutes (located down the midline of the carapace). All five of these map turtle species are in the megacephalic (large-headed) clade where the females have large, broad heads, and all occur in the southeastern United States. The ranges of these species do not geographically overlap, with the exception of Barbour's and Escambia map turtles in some areas of the Choctawhatchee River drainage in Alabama and Florida (see figure 2, below). Additional information regarding characteristics and identification of megacephalic map turtles is described in the SSA report (Service 2023, pp. 5–8). The lack of distinctive physical features makes it difficult to differentiate among these species, even for law enforcement officers, especially considering their similar body form, shell markings, and head markings (Selman 2021, pers. comm). The Alabama map turtle, Barbour's map turtle, Escambia map turtle, and Pascagoula map turtle all closely resemble in appearance, at the point in question, the Pearl River map turtle such that enforcement personnel would have substantial difficulty in

attempting to differentiate between the listed and unlisted species.

*Is the effect of this substantial difficulty an additional threat to the Pearl River map turtle?*

Under 50 CFR 17.50(b)(2), we considered the possibility that an additional threat is posed to the Pearl River map turtle by unauthorized trade or commerce by persons who misrepresent Pearl River map turtle specimens as Alabama map turtle, Barbour's map turtle, Escambia map turtle, or Pascagoula map turtle specimens, because this might result in the Pearl River map turtle entering the global black market via the United States or contributing to market demand for the Pearl River map turtle. Collection is a real threat to many turtle species in the United States and globally (Stanford et al. 2020, entire), as turtles are collected in the wild and sold into the pet trade. This potential unauthorized trade or commerce of Pearl River map turtles is caused by a lack of distinct physical characteristics and difficulty in distinguishing individual species of megacephalic map turtles, posing a problem for Federal and State law enforcement agents. The listing of the Alabama map turtle, Barbour's map turtle, Escambia map turtle, and Pascagoula map turtle as threatened due to similarity of appearance minimizes the possibility that private and commercial collectors will be able to misrepresent Pearl River map turtles as Alabama map turtles, Barbour's map turtles, Escambia map turtles, or Pascagoula map turtles for private or commercial purposes. Therefore, we find that the difficulty enforcement personnel will have in attempting to differentiate among the megacephalic map turtle species would pose an additional threat to the Pearl River map turtle.

*Would treatment of the Alabama map turtle, Barbour's map turtle, Escambia map turtle, and Pascagoula map turtle as endangered or threatened due to similarity of appearance substantially facilitate the enforcement and further the policy of the Act?*

The listing of the Alabama map turtle, Barbour's map turtle, Escambia map turtle, and Pascagoula map turtle due to similarity of appearance will facilitate Federal, State, and local law enforcement agents' efforts to curtail unauthorized possession, collection, and trade in the Pearl River map turtle. Listing the four similar map turtle species due to similarity of appearance under section 4(e) of the Act and providing applicable prohibitions and exceptions in a rule issued under section 4(d) of the Act will substantially facilitate the enforcement and further the policy of the Act for the Pearl River map turtle. For these reasons, we are listing the Alabama map turtle (occurring in Alabama, Georgia, Mississippi, and Tennessee), Barbour's map turtle (occurring in Alabama, Florida, and Georgia), Escambia map turtle (occurring in Alabama and Florida), and Pascagoula map turtle (occurring in Mississippi) as threatened due to similarity of appearance to the Pearl River map turtle pursuant to section 4(e) of the Act.

With this final rule, we do not consider the Alabama map turtle, Barbour's map turtle, Escambia map turtle, or Pascagoula map turtle to be biologically threatened or endangered, but we have determined that listing the Alabama map turtle, Barbour's map turtle, Escambia map turtle, and Pascagoula map turtle as threatened species under the similarity of appearance provision of section 4(e) of the Act, coupled with a 4(d) rule as discussed below, minimizes misidentification and enforcement-related issues. This listing will promote and enhance the conservation of the Pearl River map turtle.

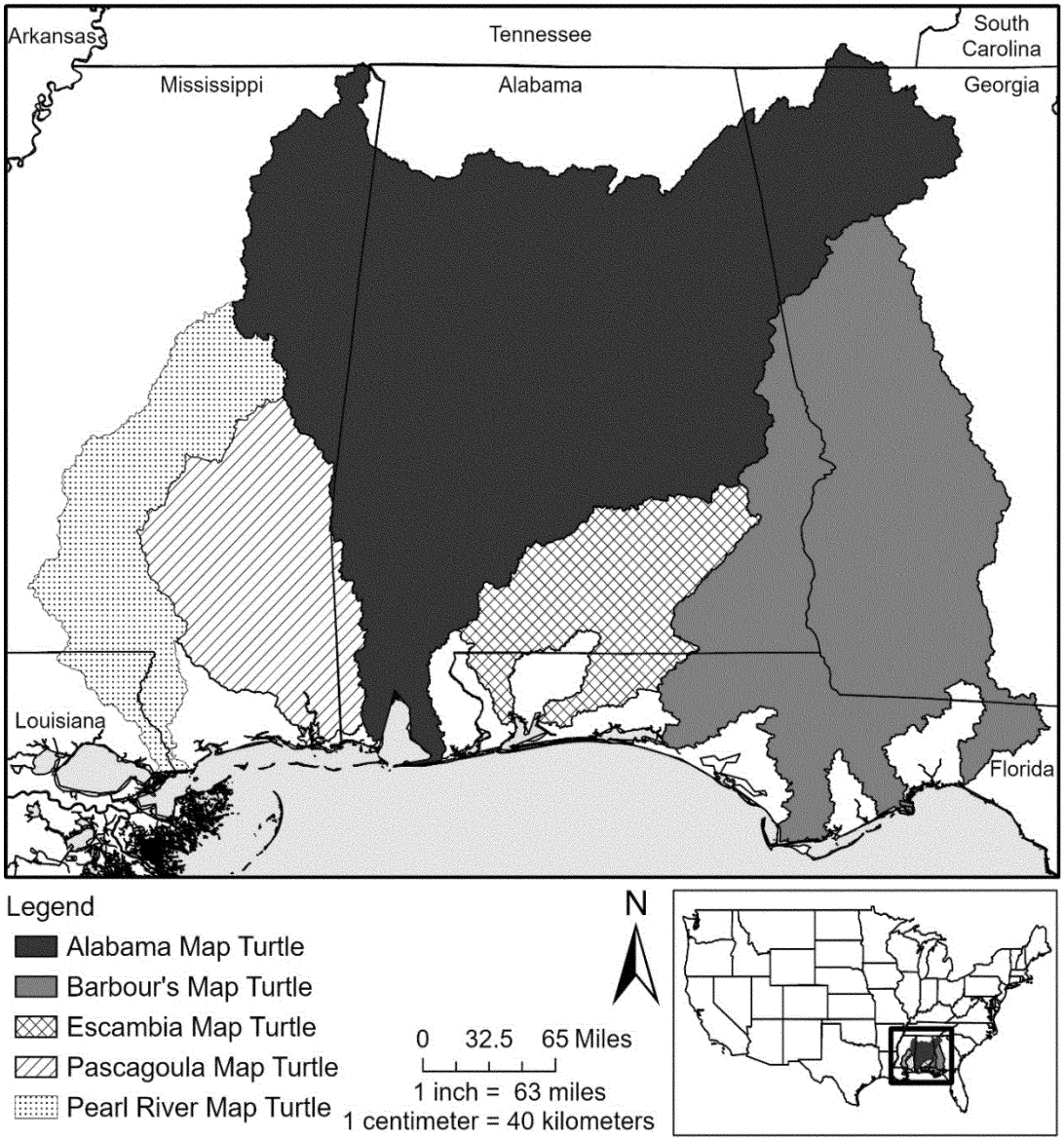


Figure 2. River drainages occupied by Alabama map turtle, Barbour's map turtle, Escambia map turtle, Pascagoula map turtle, and Pearl River map turtle. This map does not depict the current known range of each species within their respective river drainages.

*V. Protective Regulations Issued Under Section 4(d) of the Act for the Alabama Map Turtle, Barbour's Map Turtle, Escambia Map Turtle, and Pascagoula Map Turtle*

Whenever a species is listed as a threatened species under the Act, the Secretary may specify regulations that she deems necessary and advisable to provide for the conservation of that species under the authorization of section 4(d) of the Act. Because we are listing the Alabama map turtle (*Graptemys pulchra*), Barbour's map turtle (*Graptemys barbouri*), Escambia map turtle (*Graptemys ernsti*), and Pascagoula map turtle (*Graptemys gibbonsi*) as threatened species due to similarity of appearance to the Pearl River map turtle (see IV. Similarity of Appearance for the Alabama Map Turtle, Barbour's Map Turtle, Escambia Map Turtle, and Pascagoula Map Turtle, above), we are finalizing a 4(d) rule to minimize misidentification and enforcement-related issues. This 4(d) rule will promote and enhance the conservation of the Pearl River map turtle.

This 4(d) rule establishes certain prohibitions on take in the form of collection, capturing, and trapping of these four similar-in-appearance species of map turtle in order to protect the Pearl River map turtle from unlawful take, unlawful possession, and unlawful trade. In this context, take in the form of collect, capture, or trap is defined as any activity where Alabama map turtles, Barbour's map turtles, Escambia map turtles, or Pascagoula map turtles are, or are attempted to be, collected, captured, or trapped from wild populations. Incidental take associated with all otherwise legal activities involving the Alabama map turtle, Barbour's map turtle, Escambia map turtle, and Pascagoula map turtle that are conducted in accordance with applicable State, Federal, Tribal, and

local laws and regulations is not considered prohibited under this 4(d) rule.

**Provisions of the 4(d) Rule for the Alabama Map Turtle, Barbour's Map Turtle, Escambia Map Turtle, and Pascagoula Map Turtle**

The protective regulations for Alabama map turtle, Barbour's map turtle, Escambia map turtle, and Pascagoula map turtle incorporate prohibitions from section 9(a)(1) to address the threats to the Pearl River map turtle. The prohibitions of section 9(a)(1) of the Act, and implementing regulations codified at 50 CFR 17.21, make it illegal for any person subject to the jurisdiction of the United States to commit, to attempt to commit, to solicit another to commit or to cause to be committed any of the following acts with regard to any endangered wildlife: (1) import into, or export from, the United States; (2) take (which includes harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect) within the United States, within the territorial sea of the United States, or on the high seas; (3) possess, sell, deliver, carry, transport, or ship, by any means whatsoever, any such wildlife that has been taken illegally; (4) deliver, receive, carry, transport, or ship in interstate or foreign commerce, by any means whatsoever and in the course of commercial activity; or (5) sell or offer for sale in interstate or foreign commerce. This protective regulation includes most of these prohibitions because the Pearl River map turtle is at risk of extinction in the foreseeable future and putting these prohibitions in place for Alabama map turtle, Barbour's map turtle, Escambia map turtle, and Pascagoula map turtle will help to reduce threats to the Pearl River map turtle.

Under the Act, ''take'' means to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct. Some of these provisions have been further defined in regulation at 50 CFR 17.3. Take can result knowingly or otherwise, by direct and indirect impacts, intentionally or incidentally. Regulating take will help address primary threats to the Pearl River map turtle. We are only prohibiting intentional take in the form of collect, capture, or trap, because the threat of collectors being able to misrepresent Pearl River map turtles as Pearl River map turtles as Alabama map turtles, Barbour's map turtles, Escambia map turtles, or Pascagoula map turtles for private or commercial purposes. This potential unauthorized trade or commerce of Pearl River map turtles is caused by a lack of distinct physical characteristics and difficulty in distinguishing individual species of megacephalic map turtles, posing a problem for Federal and State law enforcement agents. Exceptions to the prohibition on take include the general exceptions to the prohibition on take of endangered wildlife, as set forth in 50 CFR 17.21 and additional exceptions, as described below.

Despite these prohibitions regarding threatened species, we may under certain circumstances issue permits to carry out one or more otherwise prohibited activities, including those described above in accordance with 50 CFR 17.32. The statute also contains certain exemptions from the prohibitions, which are found in sections 9 and 10 of the Act.

In addition, to further the conservation of the species, any employee or agent of the Service, any other Federal land management agency, the National Marine Fisheries Service, a State conservation agency, or a federally recognized Tribe, who is designated by their agency or Tribe for such purposes, may, when acting in the course of their official duties, take threatened wildlife without a permit if such action is necessary to: (i) Aid a sick, injured, or orphaned specimen; or (ii) Dispose of a dead specimen; or (iii) Salvage a dead specimen that may be useful for scientific study; or (iv) Remove specimens that constitute a demonstrable but nonimmediate threat to human safety, provided that the taking is done in a humane manner; the taking may involve killing or injuring only if it has not been reasonably possible to eliminate such threat by live capturing and releasing the specimen unharmed, in an appropriate area. Because collection is the only form of take that is prohibited, this exception will allow any employee or agent of the Service, any other Federal land management agency, the National Marine Fisheries Service, a State conservation agency, or a federally recognized Tribe to collect the Alabama map turtle, Barbour's map turtle, Escambia map turtle, or Pascagoula map turtle.

We recognize the special and unique relationship that we have with our State natural resource agency partners in contributing to conservation of listed species. State agencies often possess scientific data and valuable expertise on the status and distribution of endangered, threatened, and candidate species of wildlife and plants. State agencies, because of their authorities and their close working relationships with local governments and landowners, are in a unique position to assist us in implementing all aspects of the Act. In this regard, section 6 of the Act provides that we must cooperate to the maximum extent practicable with the States in carrying out programs authorized by the Act. Therefore, any qualified employee or agent of a State conservation agency that is a party to a cooperative agreement with us in accordance with section 6(c) of the Act, who is designated by his or her agency for such purposes, will be able to conduct activities that may result in otherwise prohibited take (in this case, collection) without additional authorization.

The 4(d) rule does not prohibit incidental take of the Alabama map turtle, Barbour's map turtle, Escambia map turtle, and Pascagoula map turtle. Incidental take is take that results from, but is not the purpose of, carrying out an otherwise lawful activity. For example, construction activities, application of pesticides and fertilizers, silviculture and forest management practices, maintenance dredging activities that remain in the previously disturbed portion of a maintained channel, and any other legally undertaken actions that result in the accidental take of an Alabama map turtle, Barbour's map turtle, Escambia map turtle, or Pascagoula map turtle will not be considered a violation of section 9 of the Act.

*Effects of the Final 4(d) Rule*

Listing the Alabama map turtle, Barbour's map turtle, Escambia map turtle, and Pascagoula map turtle as threatened species under the ''similarity of appearance'' provisions of section 4(e) of the Act, and the promulgation of a rule under section 4(d) of the Act to extend prohibitions regarding take in the form of collect, capture, or trap, import, export, and commerce to these species, will provide a conservation benefit to the Pearl River map turtle.

As the Alabama map turtle, Barbour's map turtle, Escambia map turtle, and Pascagoula map turtle can be confused with the Pearl River map turtle, we strongly recommend maintaining the appropriate documentation and declarations with legal specimens at all times, especially when importing them into the United States, and permit holders must also comply with the import/export transfer regulations at 50 CFR part 14, where applicable. All otherwise legal activities that may involve what we would normally define as incidental take (take that results from, but is not the purpose of, carrying out an otherwise lawful activity) of these

similar turtles, and which are conducted in accordance with applicable State, Federal, Tribal, and local laws and regulations, are not prohibited under this 4(d) rule.

We do not find it necessary to apply incidental take prohibitions for those otherwise legal activities to these four similar turtles (Alabama map turtle, Barbour's map turtle, Escambia map turtle, and Pascagoula map turtle), as these activities will not pose a threat to the Pearl River map turtle because: (1) Activities that affect the waters where the Alabama map turtle, Barbour's map turtle, Escambia map turtle, and Pascagoula map turtle reside will not affect the Pearl River map turtle; and (2) the primary threat as it relates to the Pearl River map turtle comes from collection and commercial trade of the similar turtles. Listing the Alabama map turtle, Barbour's map turtle, Escambia map turtle, and Pascagoula map turtle under the similarity of appearance provision of section 4(e) of the Act, coupled with this 4(d) rule, will help minimize enforcement problems related to collection and enhance conservation of the Pearl River map turtle.

**Required Determinations**

*National Environmental Policy Act (42 U.S.C. 4321 et seq.)*

Regulations adopted pursuant to section 4(a) of the Act are exempt from the National Environmental Policy Act (NEPA; 42 U.S.C. 4321 *et seq.*) and do not require an environmental analysis under NEPA. We published a notice outlining our reasons for this determination in the **Federal Register** on October 25, 1983 (48 FR 49244). This includes listing, delisting, and reclassification rules, as well as critical habitat designations and species-specific protective regulations promulgated concurrently with a decision to list or reclassify a species as threatened. The courts have upheld this position (*e.g., Douglas County* v. *Babbitt,* 48 F.3d 1495 (9th Cir. 1995) (critical habitat); *Center for Biological Diversity* v. *U.S. Fish and Wildlife Service,* 2005 WL 2000928 (N.D. Cal. Aug. 19, 2005) (concurrent 4(d) rule)).

*Government-to-Government Relationship With Tribes*

In accordance with the President's memorandum of April 29, 1994 (Government-to-Government Relations with Native American Tribal Governments; 59 FR 22951, May 4, 1994), Executive Order 13175 (Consultation and Coordination with Indian Tribal Governments), the President's memorandum of November 30, 2022 (Uniform Standards for Tribal Consultation; 87 FR 74479, December 5, 2022), and the Department of the Interior's manual at 512 DM 2, we readily acknowledge our responsibility to communicate meaningfully with federally recognized Tribes and Alaska Native Corporations (ANCs) on a government-to-government basis. In accordance with Secretaries' Order 3206 of June 5, 1997 (American Indian Tribal Rights, Federal-Tribal Trust Responsibilities, and the Endangered Species Act), we readily acknowledge our responsibilities to work directly with Tribes in developing programs for healthy ecosystems, to acknowledge that Tribal lands are not subject to the same controls as Federal public lands, to remain sensitive to Indian culture, and to make information available to Tribes. We coordinated with Tribes within the Pearl River map turtle's range when we initiated the SSA process. We also requested review of the SSA report and addressed comments accordingly. We also coordinated with Tribes within the Alabama, Barbour's, and Escambia map turtles' ranges, requesting information regarding threats and conservation actions for those species. There are no Tribes within the range of the Pascagoula map turtle.

**References Cited**

A complete list of references cited in this rulemaking is available on the internet at *https://www.regulations.gov* and upon request from the Mississippi Ecological Services Field Office (see **FOR FURTHER INFORMATION CONTACT**).

**Authors**

The primary authors of this final rule are the staff members of the Fish and Wildlife Service's Species Assessment Team and the Mississippi Ecological Services Field Office.

**List of Subjects in 50 CFR Part 17**

Endangered and threatened species, Exports, Imports, Plants, Reporting and recordkeeping requirements, Transportation, Wildlife.

**Regulation Promulgation**

Accordingly, we amend part 17, subchapter B of chapter I, title 50 of the Code of Federal Regulations, as set forth below:

## PART 17—ENDANGERED AND THREATENED WILDLIFE AND PLANTS

■ 1. The authority citation for part 17 continues to read as follows:

**Authority:** 16 U.S.C. 1361–1407; 1531–1544; and 4201–4245, unless otherwise noted.

■ 2. In § 17.11, in paragraph (h), amend the List of Endangered and Threatened Wildlife by adding entries for ''Turtle, Alabama map'', ''Turtle, Barbour's map'', ''Turtle, Escambia map'', ''Turtle, Pascagoula map'', and ''Turtle, Pearl River map'' in alphabetical order under Reptiles to read as follows:

**§ 17.11 Endangered and threatened wildlife.**

* * * * *

(h) * * *

| Common name | Scientific name | Where listed | Status | Listing citations and applicable rules |
|---|---|---|---|---|
| * | * | * | * | * * |
| | | REPTILES | | |
| * | * | * | * | * * |
| Turtle, Alabama map | *Graptemys pulchra* | Wherever found | T (S/A) | 89 FR [INSERT **FEDERAL REGISTER** PAGE WHERE THE DOCUMENT BEGINS], 7/12/2024; 50 CFR 17.42(n).[4d] |
| * | * | * | * | * * |
| Turtle, Barbour's map | *Graptemys barbouri* | Wherever found | T (S/A) | 89 FR [INSERT **FEDERAL REGISTER** PAGE WHERE THE DOCUMENT BEGINS], 7/12/2024; 50 CFR 17.42(n).[4d] |

| Common name | Scientific name | Where listed | Status | Listing citations and applicable rules |
|---|---|---|---|---|
| * | * * | * | * | * * |
| Turtle, Escambia map ..... | *Graptemys ernsti* ..... | Wherever found ..... | T (S/A) | 89 FR [INSERT **FEDERAL REGISTER** PAGE WHERE THE DOCUMENT BEGINS], 7/12/2024; 50 CFR 17.42(n).[4d] |
| * | * * | * | * | * * |
| Turtle, Pascagoula map .. | *Graptemys gibbonsi* ..... | Wherever found ..... | T (S/A) | 89 FR [INSERT **FEDERAL REGISTER** PAGE WHERE THE DOCUMENT BEGINS], 7/12/2024; 50 CFR 17.42(n).[4d] |
| * | * * | * | * | * * |
| Turtle, Pearl River map ... | *Graptemys pearlensis* .... | Wherever found ..... | T | 89 FR [INSERT **FEDERAL REGISTER** PAGE WHERE THE DOCUMENT BEGINS], 7/12/2024; 50 CFR 17.42(m).[4d] |
| * | * * | * | * | * * |

■ 3. Amend § 17.42 by adding paragraphs (m) and (n) to read as follows:

**§ 17.42 Species-specific rules—reptiles.**

* * * * *

(m) Pearl River map turtle (*Graptemys pearlensis*).

(1) *Prohibitions.* The following prohibitions that apply to endangered wildlife also apply to the Pearl River map turtle. Except as provided under paragraphs (m)(2) and (3) of this section and §§ 17.4 and 17.5, it is unlawful for any person subject to the jurisdiction of the United States to commit, to attempt to commit, to solicit another to commit, or cause to be committed, any of the following acts in regard to this species:

(i) Import or export, as set forth at § 17.21(b) for endangered wildlife.

(ii) Take, as set forth at § 17.21(c)(1) for endangered wildlife.

(iii) Possession and other acts with unlawfully taken specimens, as set forth at § 17.21(d)(1) for endangered wildlife.

(iv) Interstate or foreign commerce in the course of a commercial activity, as set forth at § 17.21(e) for endangered wildlife.

(v) Sale or offer for sale, as set forth at § 17.21(f) for endangered wildlife.

(2) *General exceptions from prohibitions.* In regard to this species, you may:

(i) Conduct activities as authorized by a permit under § 17.32.

(ii) Take, as set forth at § 17.21(c)(2) and (4) for endangered wildlife.

(ii) Possess and engage in other acts with unlawfully taken wildlife, as set forth at § 17.21(d)(2) for endangered wildlife.

(iii) Take as set forth at § 17.31(b).

(3) *Exceptions from prohibitions for specific types of incidental take.* You may take this species incidental to an otherwise lawful activity caused by silvicultural practices and forest management activities that use State-approved best management practices designed to protect water quality and stream and riparian habitat.

(n) Alabama map turtle (*Graptemys pulchra*), Barbour's map turtle (*Graptemys barbouri*), Escambia map turtle (*Graptemys ernsti*), and Pascagoula map turtle (*Graptemys gibbonsi*).

(1) *Prohibitions.* The following prohibitions that apply to endangered wildlife also apply to the Alabama map turtle, Barbour's map turtle, Escambia map turtle, and Pascagoula map turtle. Except as provided under paragraph (n)(2) of this section and §§ 17.4 and 17.5, it is unlawful for any person subject to the jurisdiction of the United States to commit, to attempt to commit, to solicit another to commit, or cause to be committed, any of the following acts in regard to these species:

(i) Import or export, as set forth at § 17.21(b) for endangered wildlife.

(ii) Intentional take in the form of collect, capture, or trap (other than for scientific purposes).

(iii) Possession and other acts with unlawfully taken specimens, as set forth at § 17.21(d)(1) for endangered wildlife.

(iv) Interstate or foreign commerce in the course of a commercial activity, as set forth at § 17.21(e) for endangered wildlife.

(v) Sale or offer for sale, as set forth at § 17.21(f) for endangered wildlife.

(2) *General exceptions from prohibitions.* In regard to these species, you may:

(i) Conduct activities as authorized by a permit under § 17.32.

(ii) Take as set forth at § 17.31(b).

(iii) Possess and engage in other acts with unlawfully taken wildlife, as set forth at § 17.21(d)(2) for endangered wildlife.

**Martha Williams,**

*Director, U.S. Fish and Wildlife Service.*

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