

C O M M E N T S

Small Critter, Big Problem: Protecting the Pearl River Map Turtle in Mississippi

by Kristina Alexander

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Mississippi has 47 animal species federally protected under the Endangered Species Act (ESA).¹ That list includes all types of animals, from whales to mollusks, but it does not include the Pearl River map turtle (*Graptemys pearlensis*). This is notable because the Pearl River map turtle is considered endangered or perhaps critically endangered by the International Union for Conservation of Nature (IUCN),² and trade of the map turtle is restricted by international treaty—the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES)³—at the request of the United States. This Comment will examine the existing protections for the turtle—state, federal, and international—to demonstrate why ESA protection is still needed to prevent the extinction of *G. pearlensis*.

I. Background on the ESA

The ESA authorizes the U.S. Fish and Wildlife Service (FWS) of the U.S. Department of the Interior to list as endangered any plant or animal that is “in danger of extinction throughout all or a significant portion of its range.”⁴ Species likely to become endangered are listed as threatened species.⁵ “Species” is broadly defined within the

Act to include subspecies and distinct population segments (DPS) “which interbreed[] when mature.”⁶

FWS may list a species on its own or in response to a petition filed by any interested person.⁷ In either case, the listing determination must be based solely on the best scientific data available.⁸ FWS may base its findings on any of five factors: loss of or harm to habitat; overuse for commercial, recreational, scientific, or educational purposes; disease or predation; whether existing regulatory mechanisms are already in place; or other natural or man-made factors affecting the species’ continued existence.⁹

Once listed, a species may not be captured, harassed, injured, or killed—described as a “take” under the Act.¹⁰ Additionally, the Act imposes responsibilities on federal agencies with regard to listed species. Generally, federal agencies must use “their authorities . . . by carrying out programs for the conservation of endangered species and threatened species.”¹¹ More specifically, federal agencies must ensure that their actions are “not likely to jeopardize the continued existence of any endangered species or threatened species” or to harm or modify those species’ critical habitat.¹²

To do this, agencies engage in “consultation,” in which the action agency communicates with FWS or the National Marine Fisheries Service (NMFS), in the case of marine species, to avoid jeopardizing listed species.¹³ This is also referred to as a Section 7 consultation.¹⁴ If jeopardy is found by either FWS or NMFS, that service will suggest reasonable and prudent alternatives to the proposed

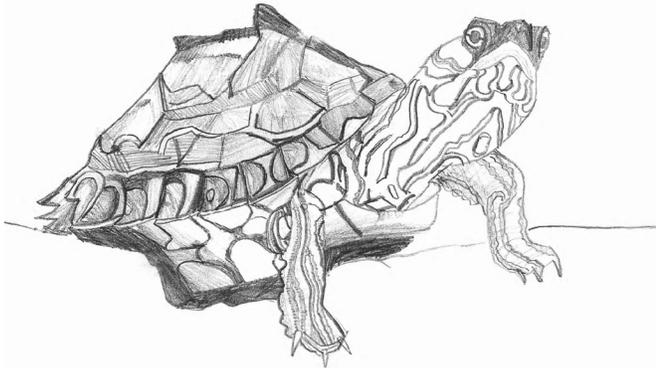
1. 16 U.S.C. §§1531-1544; ELR STAT. ESA §§2-18; The list is based on species “believed to or known to occur in Mississippi,” acknowledging that species are protected wherever they may occur, even if not included on the U.S. Fish and Wildlife Service (FWS) state list. FWS Environmental Conservation Online System (ECOS), *Listed Species Believed to or Known to Occur in Mississippi*, <https://ecos.fws.gov/ecp0/reports/species-listed-by-state-report?state=MS&status=list> (last visited Jan. 1, 2018); 16 U.S.C. §§1531-1544; ELR STAT. ESA §§2-18.
2. IUCN, *Home Page*, <https://www.iucn.org> (last visited Jan. 1, 2018).
3. Mar. 3, 1973, 27 U.S.T. 108. See CITES, *Home Page*, <https://www.cites.org> (last visited Jan. 1, 2018).
4. 16 U.S.C. §1532(6). Insects found to be pests may not be listed.
5. *Id.* §1532(20).

6. *Id.* §1532(16). Only vertebrates may be listed as DPS.
7. *Id.* §1533.
8. *Id.* §1533(b)(1)(A).
9. *Id.* §1533(a)(1)(A)-(E).
10. *Id.* §1532(19).
11. *Id.* §1536(a)(1).
12. *Id.* §1536(a)(2).
13. *Id.* §1536.
14. Pub. L. No. 93-205, §7, 87 Stat. 884 (1973).

agency action to avoid such a threat. The consultation takes place before the agency action begins, and, largely because of the citizen suit provision in the ESA,¹⁵ a project may be enjoined while a court determines whether the requirements of consultation were met.

II. Map Turtles Generally

Figure 1. Map Turtle (*Graptemys*)



Credit: Collin W. Alexander

Map turtles (*Graptemys*), sometimes called sawbacks, have ridges down their backs that often form little spikes (see Figure 1). They can be found from the Guadalupe River in Texas to rivers throughout the eastern half of the United States and into eastern Canada. The turtles are dimorphic, with males' carapace measuring about six inches and females' growing to 10-11 inches. The lifetime of a map turtle varies among species, from the common map turtle living approximately 20 years¹⁶ to the Pearl River map turtle having an estimated 30-year life expectancy. Map turtles need sandbars for nesting, snags for basking, and clean water with mollusks to eat.

FWS recognizes either 11 or 12 species of the genus *Graptemys*, depending on the basis for conservation.¹⁷ Thirteen are recognized internationally.¹⁸ The species in flux

are the common map turtle, *G. geographica*, and the Pearl River map turtle, *G. pearlensis*. These species do not appear on FWS records of species that are either ESA-listed, once considered for listing, or currently being considered for listing, likely because the common map turtle has stable populations and because the Pearl River map turtle is newly identified as a species. However, the common map turtle appears on the FWS notice of *Graptemys* species protected under CITES, whereas the Pearl River map turtle does not.¹⁹

The common map turtle, or the northern map turtle, is identified by the IUCN as a species of least concern with regards to the likelihood of its extinction.²⁰ It has a range from the Mississippi-Missouri Rivershed to rivers as far north as Quebec and as far south as Tennessee; its population may be aided by the addition of the invasive zebra mussel to its meal options.²¹ However, species of map turtles with smaller habitats, especially those in the South, are at risk of extinction.²²

In 2010, a petition was filed to list 404 species of plants and animals in the Southeast, including five species of map turtles.²³ At that time, FWS had already listed two species of *Graptemys* as threatened under the ESA, the ringed map turtle, *G. oculifera*, and the yellow-blotched map turtle, *G. flavimaculata*.²⁴ FWS is still reviewing whether to list four species based on that petition: the Pascagoula map turtle (*G. gibbonsi*)—found in Louisiana and Mississippi; Escambia map turtle (*G. ernsti*)—found in four Florida counties and parts of Alabama; black-knobbed map turtle (*G. nigri-noda*)—found in Alabama and Mississippi; and Alabama map turtle (*G. pulchra*)—found in Alabama, Georgia, and Mississippi. In 2017, as the final determination based on the 2010 petition, FWS determined that Barbour's map turtle (*G. barbouri*)—found in six Florida counties—did not warrant listing.²⁵

The listed map turtles—the ringed map turtle and the yellow-blotched map turtle—are noted for their pronounced carapace spikes and strong coloration, with yel-

15. 16 U.S.C. §1540(g).

16. IUCN Red List of Threatened Species, *Graptemys Geographica*, <http://www.iucnredlist.org/details/165598/0> (last visited Jan. 1, 2018).

17. Sometimes FWS identifies 11, as it does in its ESA species reports (see FWS ECOS, *Species Reports—Generate Species List* (enter search term “*Graptemys*”), <https://ecos.fws.gov/ecp0/reports/ad-hoc-species-report-input> (last visited Jan. 1, 2018)); sometimes it identifies 12 (see Inclusion of Alligator Snapping Turtle (*Macrochelys [=Macrochelys] temminckii*) and All Species of Map Turtle (*Graptemys* spp.) in Appendix III to the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES), 70 Fed. Reg. 74700, 74702 (Dec. 16, 2005) [hereinafter Inclusion of All Species of Map Turtle]; CITES, Mar. 3, 1973, app. III, 27 U.S.T. 108 (“*Graptemys*”). *G. ouachitensis*, identified as the Ouachita map turtle in the CITES listing by FWS, is called *G. ouachitensis sabinensis* on the ESA list.

18. The IUCN recognizes 13 species. IUCN Red List of Threatened Species, *supra* note 16.

19. Inclusion of All Species of Map Turtle, *supra* note 17.

20. IUCN Red List of Threatened Species, *supra* note 16.

21. University of Georgia Savannah River Ecology Laboratory, *Common Map Turtle (Graptemys Geographica)*, <https://srelherp.uga.edu/turtles/grageo.htm> (last visited Jan. 1, 2018).

22. IUCN Red List of Threatened Species, *Graptemys Caglei*, <http://www.iucnredlist.org/details/9497/0> (last visited Jan. 1, 2018).

23. See Partial 90-Day Finding on a Petition to List 404 Species in the Southeastern United States as Endangered or Threatened With Critical Habitat; Proposed Rule, 76 Fed. Reg. 59836, 59837 (Sept. 27, 2011).

24. FWS ECOS, *Ringed Map Turtle (Graptemys Oculifera)*, <https://ecos.fws.gov/ecp0/profile/speciesProfile?Id=2664> (last visited Jan. 1, 2018), and FWS ECOS, *Yellow-Blotched Map Turtle (Graptemys Flavimaculata)*, <https://ecos.fws.gov/ecp0/profile/speciesProfile?Id=7730> (last visited Jan. 1, 2018). Under the Act, a species is threatened if it “is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range.” 16 U.S.C. §1532(20). Endangered is defined as “in danger of extinction throughout all or a significant portion of its range.” *Id.* §1532(6).

25. 12-Month Findings of Petitions to List 25 Species as Endangered or Threatened Species, 82 Fed. Reg. 46618 (Oct. 5, 2017).

low or orange rings around their carapaces or other bright markings making them interesting to pet owners. When proposing the ringed map turtle for listing in 1986 and the yellow-blotched map turtle in 1991, FWS described each as a “very attractive turtle,” stating that they are “vulnerable to knowledgeable collectors” who can seriously diminish a population quickly in order to sell as pets, both domestically and internationally.²⁶ Habitat loss was also given as a reason for listing each species, pointing to flood control projects that removed basking logs and sandy beaches for nesting.²⁷

Map turtles also are at risk because their propensity to bask on logs makes them attractive targets for potshots,²⁸ or, as the IUCN described it, “wanton destruction by . . . plinking rednecks.”²⁹ Cagle’s map turtle (*G. caglei*), for example, was considered for listing because of its dwindling population, but when the state of Texas offered protection to limit the turtles as target practice and stated there were “no foreseeable threats from reservoir construction,” FWS found that federal listing was not required.³⁰ The ringed map turtle is also protected by the state of Mississippi,³¹ which categorizes it as endangered, and the state of Louisiana,³² which tags it as threatened. The state of Mississippi, which has jurisdiction over the complete range of the yellow-blotched map turtle, lists it as endangered.³³

III. The Pearl River Map Turtle

The Pearl River map turtle has been described as the least-known species of the least-studied turtle genera in North America.³⁴ It is found only along the 444-mile Pearl River in Louisiana and Mississippi.

Until 2010, the Pearl River map turtle was believed to be a population of the Pascagoula map turtle³⁵ and not a distinct species. In that year, scientists published findings of genetic distinctions, as well as finding “significant carapace pattern variation and morphological differentiation”

between the two.³⁶ The IUCN identifies the Pearl River map turtle as a species, relying on that 2010 study for the distinction.³⁷ FWS, despite appearing eager to accept contested findings of a new wolf species—the eastern wolf (*Canis lycaon*)—a year later,³⁸ still shows no signs of acknowledging the Pearl River map turtle, notwithstanding the international response. But as no petition to list appears to have been filed, and the CITES listing already extends trade protection to the species, there would be little opportunity for FWS to demonstrate awareness. It may require FWS to make a listing determination, even a negative one, to raise awareness of *G. pearlensis*.

The Pearl River map turtle’s habitat is divided into two sections: north of the Ross Barnett Reservoir in Jackson, Mississippi, and south of the reservoir. Its limited range puts it at risk, as the smaller the habitat, the fewer the options for adaptation and survival.³⁹ The reservoir is one of several U.S. Army Corps of Engineers (Corps) projects that have adversely impacted the turtle’s habitat.⁴⁰ The Pearl River map turtle shares this habitat with the ringed map turtle. The FWS conservation plan for the ringed map turtle took effect in 1990, and 12 miles of the Pearl River north of the reservoir are protected, which includes areas within a national wildlife refuge.⁴¹

The conservation plan, however, has not ended the Pearl River map turtle’s population decline, and more efforts may be needed to protect *G. pearlensis* from extinction than were deployed for *G. oculifera*. According to a 2017 report based on counting turtles along the Pearl River from 1988 to 2014, the numbers of *G. pearlensis* were “much lower than that of *G. oculifera*” when based on basking density, and *G. oculifera*’s relative abundance compared to *G. pearlensis* was “much greater.”⁴² Notably, the ringed map turtle was federally listed as threatened and state listed as endangered throughout the census period. Whereas the

26. Proposed Threatened Status for the Ringed Sawback Turtle, 51 Fed. Reg. 2741, 2742 (Jan. 21, 1986); Threatened Status for the Yellow-Blotched Map Turtle, *Graptemys flavimaculata*, 56 Fed. Reg. 1459, 1461 (Jan. 14, 1991).

27. *Id.*

28. *Id.* at 2742 (“Wanton shooting (use of the basking turtles for target practice) . . . pose[s] a threat to the ringed sawback turtle. This threat becomes more serious as the population declines owing to impacts of habitat alteration.”).

29. IUCN Red List of Threatened Species, *Graptemys Pearlensis*, <http://www.iucnredlist.org/details/184437/0> (last visited Jan. 1, 2018).

30. Endangered and Threatened Wildlife and Plants; Review of Native Species That Are Candidates or Proposed for Listing as Endangered or Threatened; Annual Notice of Findings on Resubmitted Petitions; Annual Description of Progress on Listing Actions, 71 Fed. Reg. 53756, 53767 (Sept. 12, 2006) [hereinafter 2006 Review of Native Species] (“Cagle’s map turtle is also vulnerable to overcollecting and target shooting but actions taken by Texas Parks and Wildlife Department (TPWD) have increased protection of the species against collecting and shooting.”).

31. Miss. CODE R. §40-5:2.4(A) (current as of Oct. 2017).

32. LA. ADMIN. CODE tit. 76, §317.2 (2017) (per LA. REV. STAT. ANN. §56:1904 (2017) (referred to as the ringed sawback turtle)).

33. Miss. CODE R. §40-5:2.4(A) (current as of Oct. 2017).

34. Will Selman & Robert L. Jones, *Population Structure, Status, and Conservation of Two Graptemys Species From the Pearl River, Mississippi*, 51 J. HERPETOLOGY 27 (2017).

35. *G. gibbonsi*.

36. Joshua R. Ennen et al., *Genetic and Morphological Variation Between Populations of the Pascagoula Map Turtle (Graptemys Gibbonsi) in the Pearl and Pascagoula Rivers With Description of a New Species*, 9 CHELONIAN CONSERVATION & BIOLOGY 98-113 (2010).

37. IUCN Red List of Threatened Species, *supra* note 29 (“Previously this species was considered the Pearl River population of *Graptemys gibbonsi*, until *G. pearlensis* was described by Ennen et al. (2010) as a full separate species.”).

38. See Removing the Gray Wolf (*Canis Lupus*) From the List of Endangered and Threatened Wildlife and Maintaining Protections for the Mexican Wolf (*Canis Lupus Baileyi*) by Listing It as Endangered, 78 Fed. Reg. 35664, 35664-5717 (June 13, 2013) [hereinafter Removing the Gray Wolf] (“we recognize recent taxonomic information indicating that the gray wolf subspecies *Canis lupus lycaon* should be elevated to the full species *C. lycaon*. . . . We understand that different conclusions may be drawn by taxonomists and other scientists depending on whether they give precedence to morphological or genetic data”); Bridgett M. vonHoldt et al., *Whole-Genome Sequence Analysis Shows That Two Endemic Species of North American Wolf Are Admixtures of the Coyote and Gray Wolf*, 2 SCI. ADVANCES (2016).

39. See generally Steven R. Beissinger, *Ecological Mechanisms of Extinction*, 97 PROC. NAT’L ACAD. SCI. U.S. 11688, 11688-89 (2000) (“It is generally agreed that risk should be higher for species with small populations, small geographic ranges, and poor dispersal ability than for their ecological counterparts [. . . but that size and generation length also affect survival].”).

40. Inclusion of All Species of Map Turtle, *supra* note 17, at 74706.

41. FWS, RINGED MAP TURTLE (*GRAPTEMYS OCULIFERA*) 5-YEAR REVIEW: SUMMARY AND EVALUATION 4 (2010), https://ecos.fws.gov/docs/five_year_review/doc3270.pdf.

42. Selman & Jones, *supra* note 34, at 29-30.

authors found the *G. oculifera*'s population to be “stable” over 25 years, they found *G. pearlensis*' “population structure . . . depicts a struggling population with few reproductively mature females.”⁴³

The Pearl River map turtle appears at risk of extinction based on the same factors threatening others of its genus: habitat destruction, wanton target shooting, and collection. The turtle needs sandbanks to nest on, fallen trees to bask on, and mollusks to munch on. Dredging and clearing rivers removes the sandbanks and the fallen trees as well as increasing siltation, which harms mollusks. Scientists observed that “substantial channel filling” over 27 years had damaged the map turtle's habitat.⁴⁴

Recreation in certain areas of the Pearl River poses a threat to the turtle, as map turtles' habit of lining up on trees in the sun makes them easy targets to folks who like to shoot at unmoving things but do not want to harm rocks. The 2017 report also attributes some population losses to “increased recreational boating on the river and extended human presence on nesting sandbars” such as camping.⁴⁵ Faster and larger boats in the past couple decades may have increased direct mortalities of map turtles.⁴⁶

Additionally, the pet trade threatens the existence of *G. pearlensis*. In the 2017 report, the authors noted that “*G. pearlensis* is one of the few *Graptemys* species not protected by state or federal listing,” resulting in the fact that “many turtles of all age classes are offered for sale at pet exhibitions . . . and online.” The pet trade of the Pearl River map turtle could be curtailed without too much effort, according to the authors, who were informed that “almost all of the *G. pearlensis* currently on the market were collected from the Pearl River by a single collector,” noting that a nearby public boat ramp could contribute to those large losses.⁴⁷ The authors concluded that “all evidence indicates that additional state/federal protections, comprehensive surveys, and studies are warranted for *G. pearlensis*.”⁴⁸ The conclusion was that “chances of population extinction are higher in species with smaller populations like *G. pearlensis*. . . .”⁴⁹

IV. Why Listing Would Make a Difference to *G. Pearlensis*

Despite protection for the turtle from international trade under CITES, scientists indicate that the Pearl River map turtle will be in danger of extinction without ESA protection. This conclusion is seconded by the IUCN, which notes the turtle's population may have declined by as much as 98% since 1950.⁵⁰ As discussed earlier, species may be

listed as a result of a petition demonstrating the scientific basis for needing protection, or at the decision of FWS.⁵¹

This is where being an unknown turtle in a state with little environmental advocacy poses a risk. Add that to the fact that FWS does not acknowledge the species, and it all points to the conclusion that ignorance will not be bliss for *G. pearlensis*. Based on FWS' lack of acknowledgement of this turtle as a species, the Pearl River map turtle might not be identified as a species by FWS until a petition for listing as an endangered species is filed by an outside group. Upon that event, the turtle may be listed as a distinct species, subspecies, or population of vertebrates under the ESA.⁵²

Once listed, a species is entitled to federal protection, meaning that federal agencies participating in a project must consult with FWS to determine whether that project may harm the species or adversely affect its designated critical habitat.⁵³ Any project that would jeopardize the continued existence of that species could be blocked, barring extreme circumstances.⁵⁴

At least one such project is contemplated at present: altering the Pearl River to make a lake to allow for more recreational access.⁵⁵ The stated goal is to reduce flooding. According to newspaper reports, the project would dredge and widen the river to create commercial, residential, and recreational opportunities.⁵⁶ Dredge, widen, and increase recreation: each would threaten the habitat and population of the Pearl River map turtle. Dredging and flood control projects change water quality and flow, negatively impacting the turtle.⁵⁷

While that project is not entirely federally funded, it would require the Corps to issue a permit,⁵⁸ and an administrative review would typically be required when the Corps transferred its property to the state, as is authorized by statute.⁵⁹ The Corps would be required to consult with FWS before issuing that permit to determine whether the project would jeopardize any listed species or harm their habitat.⁶⁰

51. 16 U.S.C. §1533(b). The listing determination will be made “solely on the basis of the best scientific and commercial data available.”

52. *Id.* §1533(a)(1) (“The Secretary shall by regulation . . . determine whether any species in an endangered species or a threatened species. . . .”). *See id.* §1532(16) (the definition of “species” includes “any subspecies . . . and any distinct population segment of any species of vertebrate fish or wildlife. . . .”).

53. *Id.* §1536(a)(2).

54. *Id.* §1536(g).

55. Tim Summers Jr., “*One Lake*” Plan Moving Forward, JACKSON FREE PRESS, Oct. 19, 2016, <http://www.jacksonfreepress.com/news/2016/oct/19/one-lake-plan-moving-forward/>.

56. Donna Ladd, “*One Lake*” Tax Sails Forward, JACKSON FREE PRESS, Mar. 14, 2017, <http://www.jacksonfreepress.com/news/2017/mar/14/one-lake-tax-sails-forward/>.

57. *Id.*

58. Water Infrastructure Improvements for the Nation Act of 2016, Pub. L. No. 114-322, tit. 1, §1322(b)(4)(A), 130 Stat. 1628. The Corps “shall expedite review and decision on recommendations for the following projects for flood damage reduction and flood risk management . . . (A) Pearl River Basin, Mississippi. . . .” Title 1 of this Act is known as the Water Resources Development Act of 2016.

59. Water Infrastructure Improvements for the Nation Act of 2016, Pub. L. No. 114-322, tit. 1, §1321, 130 Stat. 1628, authorizes the Corps to “convey property in the area of Pearl River in Mississippi” without consideration.

60. 16 U.S.C. §1536(a)(2).

43. *Id.*

44. *Id.* at 33.

45. *Id.* at 34.

46. *Id.*

47. *Id.*

48. *Id.*

49. *Id.*

50. IUCN Red List of Threatened Species, *Graptemys Pearlensis* (“While hard quantitative data are absent, available information indicates that populations of *Graptemys pearlensis* have declined by 80-98% since 1950. . . .”), <http://www.iucnredlist.org/details/184437/0> (last visited Jan. 1, 2018).

The dredge-and-widen project could have more serious consequences if a reservoir is involved. Reservoirs destroy the natural river flow and the banks on which map turtles rely, as discussed within listing justifications by FWS for the yellow-blotched map turtle and the ringed sawback turtle.⁶¹ According to FWS, “[i]f the proposed reservoir is completed, it would likely result in the extirpation of the known ringed map turtle population [south of the current reservoir].”⁶² As noted, the Pearl River map turtle shares that habitat with the ringed map turtle.

Other federal projects already adversely impact the species. For example, projects authorized by the U.S. Department of Agriculture Soil Conservation Service (now known as the Natural Resources Conservation Service (NRCS)) contribute to the degradation of the Pearl River by adding siltation, harming the mollusks on which the turtles depend.⁶³ Those projects would require ESA consultation as well if the Pearl River map turtle became a listed species.

If the turtle were listed, the ESA consultation process could identify river management techniques that would be less harmful. With a reservoir in place, the natural flow of the river is altered, ending the pattern of having a rush of water at some times of the year and drier periods at others, which carve the river and create sandbanks for turtle nesting. Instead, water levels are maintained somewhat uniformly by the reservoir, or excess water is released all at once, both practices adversely impacting the turtle’s habitat.⁶⁴ The consultation process could result in reservoir levels that more closely mimic natural hydrology, such as is being tried in the Grand Canyon, for example.⁶⁵ Additionally, alternatives would be identified to reduce impacts from NRCS projects found to be contributing to siltation.

Another way in which federal listing could protect the continued existence of the turtle is that more tools for enforcement would be available. To the extent that penalties discourage takings, the enhanced fine could help stop individuals from taking turtles for trade or shooting them for fun. The federal penalty for an ESA violation is significantly higher than either state’s penalties for similar violations. Both states exercise enforcement roles over federally

listed species.⁶⁶ Currently, in Louisiana, the state penalty for taking a threatened or endangered species is \$900-\$950 and up to 120 days in jail.⁶⁷ In Mississippi, the fine is higher, but only applies to taking endangered species. The fine is \$2,000-\$5,000 and a mandatory five-day jail stay. In contrast, the ESA provides that a taking is a misdemeanor with a maximum jail time of six months, and under the Alternative Fines Act, which enhances criminal statutory fines that have not been amended since 1987, an ESA violation is classified as a Class A misdemeanor⁶⁸ with an enhanced penalty of \$100,000.⁶⁹

V. CITES

The international trade protection offered by the CITES listing does not appear to have reduced takings of the Pearl River map turtles. A CITES listing determination considers how trade threatens a species, and does not consider such ESA listing factors as loss attributable to damaged habitat, hunting, or disease. Because the basis for a CITES listing differs significantly from an ESA listing, the presence of a species on one list may not command its listing on the other. Commercial use, or trade, is just one factor in determining the health of a species under the ESA.⁷⁰

The degree of trade restrictions for a CITES-listed species is weighted according to the treaty’s three appendices, which are based on the perceived threat that trade poses to the survival of the species.⁷¹ Appendix III species, the category under which *Graptemys* fall, have the fewest restrictions.

A Party to CITES may identify species to list on Appendix III for trade protection by demonstrating several criteria.⁷² Only a country in which that species has its native range may propose listing, and the species “must be protected under that country’s laws or regulations to

61. Threatened Status for the Yellow-Blotched Map Turtle, *Graptemys Flviamaculata*, 56 Fed. Reg. 1459, 1461 (Jan. 14, 1991) (“Four existing reservoirs have modified portions of the drainage and affect water flows.”); Determination of Threatened Status for the Ringed Sawback Turtle (*Graptemys Oculifera*), 51 Fed. Reg. 45907, 45908 (Dec. 23, 1986) [hereinafter Threatened Status for Ringed Sawback Turtle] (“The ringed sawback turtle has been impacted by habitat modification in 21 percent of the historic ranged in the Pearl River by construction of Ross Barnett Reservoir. . . . Projects planned or authorized by the Corps of Engineers (Corps) will impact up to 28 percent of the remaining Pearl River habitat.”).

62. FWS, *supra* note 41, at 8.

63. Threatened Status for Ringed Sawback Turtle, *supra* note 61, at 45910 (“The SCS has at least 10 watershed projects planned or in operation within the Pearl River basin.”).

64. Selman & Jones, *supra* note 34, at 33.

65. Press Release, U.S. Department of the Interior, High-Flow Experiment Underway at Glen Canyon Dam Simulates Natural Flooding Through Grand Canyon (Nov. 7, 2016), <https://www.doi.gov/pressreleases/high-flow-experiment-underway-glen-canyon-dam-simulates-natural-flooding-through-grand>.

66. MISS. CODE ANN. §49-5-109 (2017) (applies only to species listed as endangered), LA. REV. STAT. ANN. §56:1904 (2017) (applies to both threatened and endangered).

67. LA. REV. STAT. ANN. §56:36 (2017).

68. 18 U.S.C. §3559(a)(6). The relevant section of the ESA provides that a knowing violation of the Act may be punished by imprisonment of “not more than one year,” falling into the Class A category of misdemeanor under *id.* §3559(a): “An offense that is not specifically classified by a letter grade in the section defining it, is classified if the maximum term of imprisonment authorized is—(6) one year or less but more than six months, as a Class A misdemeanor. . . .”

69. *Id.* §3571(a)(5): “for a Class A misdemeanor that does not result in death [the fine may be] not more than \$100,000.”

70. 16 U.S.C. §1533(a)(1)(B) (“The Secretary shall . . . determine whether any species is an endangered species or a threatened species because of . . . (B) overutilization for commercial . . . purposes. . . .”).

71. Species on Appendix I are considered most at risk of extinction by continued trade such that trade is authorized only “in exceptional circumstances” “in order not to endanger further their survival.” CITES, Mar. 3, 1973, art. II, §1, 27 U.S.T. 108. Less protection is afforded for species on Appendix II because those species are “not necessarily now threatened with extinction may become so” unless trade is curbed. However, trade is still restricted. African elephants, for example, are Appendix II species. CITES, art. II, §2(a), Mar. 3, 1973, 27 U.S.T. 108.

72. 50 C.F.R. §23.90(c)(4) (2017) (requiring the nominating country to seek the opinion of other nations that are within that species’ native range, major importing countries, as well as committees of CITES on the potential effects of the listing).

prevent or restrict exploitation and control trade, and the laws or regulations are being implemented.⁷³ However, it may be that the protection criterion is not strictly reviewed. For example, it does not appear that the United States offered any proof that there were U.S. legal measures restricting trade and exploitation of *Graptemys*. In the *Federal Register* notice announcing the listing, FWS referenced only the requirement that the species be native to the nominating nation, and does not mention the legal protection requirement.⁷⁴

In that 2005 notice of the CITES listing, FWS identified 12 species of *Graptemys*. It is hard to see how the United States made its case that it had existing laws restricting exploitation of map turtles, primarily because only two of a baker's dozen species of *Graptemys*—the ringed map turtle and the yellow-blotched map turtle, both listed as threatened—appear to have had any federal protection at the time of the listing. The 12th species, the common map, does not appear on the FWS record showing ESA protections for *Graptemys*. And the 13th, based on the number IUCN recognizes, the Pearl River map turtle, was not identified by scientists as a distinct species at the time of the CITES listing. However, because of the nature of the CITES Appendix III listing, which applies to all species of *Graptemys*, international trade in the Pearl River map turtle is also restricted.

The trade restrictions of CITES prevent exporting any *Graptemys* without the appropriate paperwork, obtainable through FWS.⁷⁵ To obtain a permit, the exporter must provide information on the origin of the turtle.⁷⁶ The most common types of export permits would be for: *Graptemys* bred in captivity exported under 50 C.F.R. §23.41; transfer of animals between scientific institutions under §23.48; or moving personally owned turtles across international borders under §23.44. Exporters of wild-caught *Graptemys* must identify the licenses and permits that allowed them to take the turtle from the wild.⁷⁷ State rules regarding capturing wild *Graptemys* are discussed below.

VI. Taxonomy in ESA Listings

While CITES listings may be made at the genus level of taxonomy, the ESA is different, allowing listings of species. As noted earlier, however, the ESA definition of “species” allows groups of a taxon smaller than species to be listed: “the term ‘species’ includes any subspecies of fish or wild-life or plants, and any distinct population segment of any species of vertebrate fish or wildlife which interbreeds when mature.”⁷⁸ Accordingly, FWS does not have to determine that an entire species is at risk in order to make a listing

determination. However, FWS does need to be aware of its existence. The CITES listing by genus, as well as the fact that *G. pearlensis* was only recently identified as a distinct species from *G. gibbonsi*, raises questions about the extent to which the taxonomy of *G. pearlensis* will dictate its future.

FWS considers both morphological taxonomy and genetics when identifying species. When listing the eastern wolf, for example, it found that the genetic analyses, rather than appearance distinctions, were the best available science for that listing determination.⁷⁹ At the least, FWS' determination on the gray wolf demonstrates that there is no scientific certainty regarding what is a species. The analysis for the Pearl River map turtle's species determination was based on both morphological taxonomy and genetics,⁸⁰ and appears to make a stronger case than that of the eastern wolf. With no formal opportunity for FWS to recognize the Pearl River map turtle, it is not clear whether FWS disputes the turtle species or just sees no need to make a separate identification of the species.

The ESA does not require the Pearl River map turtle to be recognized as a species, however, in order to be protected.⁸¹ FWS could identify *G. pearlensis* as a population of the Pascagoula map turtle, which, prior to the 2010 identification of the *pearlensis* species, was believed to be true by scientists.⁸² *G. gibbonsi* is not a protected species under federal or state law, other than under the same trade protections offered by CITES.⁸³ That does not pose an obstacle for using the ESA to protect *G. pearlensis*, however. The framework for identifying DPS for the purpose of protecting them considers three things: whether a population is discrete in terms of geography or behavior, significant in relation to the overall species, and has a conservation status that would be at risk if treated separately from the whole species.⁸⁴

Based on its geographic isolation, its morphological differences, and the fact that its habitat and population numbers are at risk, it appears the factors necessary to declaring *G. pearlensis* a distinct population segment are met. Of course, it is just as easy for FWS to reach the conclusion that it should be listed as a separate species, especially considering the genetic distinctions. In fact, it is easier, as the regulatory process for listing a species would not include the DPS justification as well. In either case, to reach the goal of protection, FWS would have to make a listing determination.

73. *Id.* §23.90(c)(1)-(2).

74. Inclusion of All Species of Map Turtle, *supra* note 17, at 74707 (“Any country may unilaterally list a species in Appendix III if it is a species native to that country.”).

75. 50 C.F.R. §23.13 (2017). Import would also be forbidden, but that is not the trade path for these domestic turtles, and is not discussed herein.

76. *Id.* §23.34.

77. *Id.* §23.34(b)(9).

78. 16 U.S.C. §1532(16).

79. Removing the Gray Wolf, *supra* note 38, at 35717.

80. Ennen et al., *supra* note 36.

81. WILLIAM SHAKESPEARE, *ROMEO AND JULIET*, act 2, sc. 2: “What’s in a name? that which we call a rose/By any other word would smell as sweet. . . .”

82. See *supra* note 36.

83. The IUCN identifies *G. gibbonsi* as endangered. See IUCN Red List of Threatened Species, *Graptemys Gibbonsi*, <http://www.iucnredlist.org/details/184436/0> (last visited Jan. 1, 2018). *G. gibbonsi* is one of the species FWS is considering for listing per a petition filed in 2011. See *supra* note 23.

84. Policy Regarding the Recognition of Distinct Vertebrate Population Segments Under the Endangered Species Act, 61 Fed. Reg. 4722, 4725 (Feb. 7, 1996).

VII. ESA Listing Factors Affecting *G. Pearlensis* Besides Destruction of Habitat

As discussed above, the ESA requires FWS to consider several factors in making listing determinations, such as habitat destruction.⁸⁵ Another factor is whether “the inadequacy of existing regulatory mechanisms”⁸⁶ puts the species at risk of extinction throughout all or some of its historic range.

For the Pearl River map turtle, it is likely the factors necessitating a listing would be the same as for the two *Graptemys* listed under the Act: habitat destruction and recreational shooting. But unlike the yellow-blotched map turtle and the ringed map turtle at the times of their listings, the Pearl River map turtle has international trade protection under CITES. This may shift the evaluation of the ESA factors to consider whether existing regulatory measures, such as CITES, and perhaps state law, serve as adequate protection such that additional federal protection offered by the ESA is not required. Unlike the results for the Cagle’s map turtle, in which FWS accepted that the state’s assurances regarding protection obviated federal listing,⁸⁷ that does not seem to be the case for *G. pearlensis*.

A. Other Regulatory Mechanisms—State Protection

If a state provides regulatory protection of the Pearl River map turtle, as Texas did for the Cagle’s map turtle, no ESA listing may be necessary to prevent its extinction. The Pearl River map turtle’s habitat is primarily in Mississippi, extending into Louisiana. However, neither state bans taking the turtle or harming its habitat.

For example, Mississippi’s wildlife protection law, the 1974 Nongame and Endangered Species Conservation Act,⁸⁸ protects “endangered species,” meaning wildlife “whose prospects of survival or recruitment within the state are in jeopardy or are likely within the foreseeable future to become so.”⁸⁹ The law allows listing of species based on factors similar to the ESA, and also protects as endangered any species listed as endangered under the ESA. The Mississippi list includes more than 80 animals.⁹⁰ The ringed sawback turtle, called ringed map turtle on the federal list, the yellow-blotched sawback turtle, and black-

knobbed sawback turtle, which is not federally listed, are all on the state list, but the Pearl River map turtle is not.⁹¹

Mississippi’s list is reviewed and updated every two years, with the most recent publication dated 2016. Notably, the Pearl River map turtle is identified as a non-game reptile by Mississippi regulation on a list that differentiates between *G. pearlensis* and *G. gibbonsi*, indicating the state recognizes the two distinct species.⁹² Thus, although the state appears to recognize the Pearl River map turtle as a species, it has not added it to its protected list.

The Mississippi non-game regulations provide some protection for the Pearl River map turtle, although the protection is minimal. The regulations prohibit taking turtle eggs without a scientific permit.⁹³ That applies to any species of turtle, and also bans possession, transporting, exporting, selling, or offering to sell the eggs. However, the regulations allow anybody with a hunting license to take up to four turtles of any species or subspecies for personal use from the wild, and to possess up to 10.⁹⁴ The season for personal use taking is long, between July 1 and March 31; no permit is required during the season. Turtles taken for personal use, as non-game wildlife, may not be sold.⁹⁵

Louisiana’s law requires analysis of the ESA factors to list a species.⁹⁶ The current regulatory list does not include the Pearl River map turtle, although the list has included the ringed map turtle as a threatened species since 1989.⁹⁷ The Pearl River forms a 115-mile boundary between Louisiana and Mississippi,⁹⁸ making the Louisiana portion of the Pearl River map turtle’s habitat relatively small, so it is questionable whether a Louisiana law protecting *G. pearlensis* from all takings would function to conserve the species.

B. Other Regulatory Mechanisms—International Protection: CITES Appendix III Listing

International treaty obligations can also serve as additional regulatory protection to justify why a species does not require ESA protection. For example, the 2006 CITES listing of the genus and all species of *Graptemys* makes international trade of the turtle illegal.⁹⁹ Thus, trade of the Pearl River map turtle is restricted.¹⁰⁰ International trade restrictions may not be enough to conserve a turtle that is threatened largely by loss of habitat. However, to the extent

85. 16 U.S.C. §1533. The ESA authorization for listing species based on similarity of appearance to other at-risk species (*id.* §1533(e)) may offer a separate justification for listing. The Pearl River map turtle is so physiologically similar to the Pascagoula map turtle that they only recently were identified as distinct species. FWS is reviewing the proposed listing of the Pascagoula map turtle, and the IUCN lists the Pascagoula map turtle as endangered.

86. *Id.* §1533(a)(1)(D).

87. See 2006 Review of Native Species, *supra* note 30, at 53767.

88. MISS. CODE ANN. §§49-5-101 to 49-5-119 (2017).

89. *Id.* §49-5-105(d). Recruitment is not defined within the Act.

90. MISS. CODE R. §40-5.2.4(A). Rather than listing whales by species, the Mississippi list protects the order Cetacea, except for family Delphinidae, meaning all large whales are listed. Additionally, because of the provision that all federally listed endangered species are also designated as endangered by the state, the smalltooth sawfish (*Pristis pectinata*) should be treated as if named on the state list, even though it is not specifically named by the state.

91. *Id.* §40-5.2.4.

92. *Id.* §40-5.2.3(B).

93. *Id.* §40-5.2.2(A).

94. *Id.* §40-5.2.3(D)(3)(c).

95. *Id.* §40-5.2.3(C).

96. LA. REV. STAT. ANN. §56:1904 (2017).

97. LA. ADMIN. CODE tit. 76, §317.2 (2017). The species was first listed on Dec. 20, 1989.

98. Louisiana v. Mississippi, 202 U.S. 1, 4 (1906).

99. CITES, Mar. 3, 1973, apps. I-III, 27 U.S.T. 108, <https://cites.org/eng/app/appendices.php>.

100. CITES prohibits the international trade of an Appendix III species. See also 50 C.F.R. §23.13 (2017). Under the definition in *id.* §23.5, *international trade* “means the import, introduction from the sea, export, or re-export across jurisdiction or international boundaries for any purpose whether commercial or noncommercial.”

that trade of the Pearl River map turtle is largely attributed to one person, according to some, such a ban could be easily enforced and perhaps make a difference for turtles in that person's area.

VIII. Conclusion

The Pearl River map turtle may become extinct before it becomes known. While the species is recognized internationally and by the state of Mississippi, the U.S. government does not acknowledge it, and that obscurity is harming its existence. Its numbers are declining as its habitat degrades, and an ESA listing may be the only way to save it from extinction. The loss of population since the 1950s is staggering, and trade protection offered under CITES since 2006 has not slowed the loss.

International biologists acknowledge that the turtle is endangered, perhaps critically. It is time for the U.S. government to do the same via ESA protection because state laws do not protect the turtle specifically, offering only limits on how many may be taken, rather than an outright ban.

Besides protecting the animal itself, federal protection under the ESA would add the benefit of conserving the turtle's essential habitat, the Pearl River and its tributaries. Such a designation would require more thoughtful management by the Corps and the NRCS, whose activities in the area have degraded the habitat. Additionally, the federal protection offers bigger punishment and perhaps a bigger motivation to enforce laws against intentionally taking turtles.