DEPARTMENT OF THE INTERIOR

Fish and Wildlife Service

50 CFR Part 17

[Docket No. FWS–R2–ES–2023–0026; FF09E21000 FXES1111090FEDR 234]

RIN 1018–BG11

Endangered and Threatened Wildlife and Plants; Endangered Species Status for Salina Mucket and Mexican Fawnsfoot and Designation of Critical Habitat

AGENCY: Fish and Wildlife Service, Interior.

ACTION: Proposed rule.

SUMMARY: We, the U.S. Fish and Wildlife Service (Service), propose to list two mussel species, the Salina mucket (*Potamilus metnecktayi*) and Mexican fawnsfoot (*Truncilla cognata*) (which we collectively refer to as the Rio Grande mussels in this document), as endangered species under the Endangered Species Act of 1973, as amended (Act). This determination also serves as our 12-month findings on petitions to list the Salina mucket and Mexican fawnsfoot. After a review of the best available scientific and commercial information, we find that listing the Salina mucket and Mexican fawnsfoot is warranted. We also propose to designate critical habitat for the Salina mucket and Mexican fawnsfoot under the Act. For Salina mucket, approximately 200 river miles (rmi) (321 river kilometers (rkm)) in Brewster, Terrell, and Val Verde Counties, Texas, fall within the boundaries of the proposed critical habitat designation. For Mexican fawnsfoot, approximately 185 rmi (299 rkm) in Maverick, Webb, and Zapata Counties, Texas, fall within the boundaries of the proposed critical habitat designation. We announce the availability of a draft economic analysis of the proposed designation of critical habitat for the Salina mucket and Mexican fawnsfoot. If we finalize this rule as proposed, it would add these species to the List of Endangered and Threatened Wildlife and extend the Act's protections to the species and their designated critical habitats.

DATES: We will accept comments received or postmarked on or before September 25, 2023. Comments submitted electronically using the Federal eRulemaking Portal (see **ADDRESSES**, below) must be received by 11:59 p.m. eastern time on the closing date. We must receive requests for a public hearing, in writing, at the address shown in **FOR FURTHER INFORMATION CONTACT** by September 8, 2023.

ADDRESSES: You may submit comments by one of the following methods:

(1) *Electronically:* Go to the Federal eRulemaking Portal: *https://www.regulations.gov.* In the Search box, enter FWS–R2–ES–2023–0026, which is the docket number for this rulemaking. Then, click on the Search button. On the resulting page, in the panel on the left side of the screen, under the Document Type heading, check the Proposed Rule box to locate this document. You may submit a comment by clicking on ''Comment.''

(2) *By hard copy:* Submit by U.S. mail to: Public Comments Processing, Attn: FWS–R2–ES–2023–0026, U.S. Fish and Wildlife Service, MS: PRB/3W, 5275 Leesburg Pike, Falls Church, VA 22041–3803.

We request that you send comments only by the methods described above. We will post all comments on *https://www.regulations.gov.* This generally means that we will post any personal information you provide us (see Information Requested, below, for more information).

Availability of supporting materials: Supporting materials, such as the species status assessment report, are available on the Service's website at *https://www.fws.gov/library/collections/proposed-endangered-species-status-salina-mucket-and-mexican-fawnsfoot,* at *https://www.regulations.gov* at Docket No. FWS–R2–ES–2023–0026, or both. For the proposed critical habitat designation, the coordinates or plot points or both from which the maps are generated are included in the decision file for this critical habitat designation and are available at *https://www.regulations.gov* at Docket No. FWS–R2–ES–2023–0026 and on the Service's website at *https://www.fws.gov/library/collections/proposed-endangered-species-status-salina-mucket-and-mexican-fawnsfoot.*

FOR FURTHER INFORMATION CONTACT: Karen Myers, Field Supervisor, U.S. Fish and Wildlife Service, Austin Ecological Services Field Office, 1505 Ferguson Lane, Austin, TX 78754; telephone 512–937–7371. 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, 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 endangered 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 Salina mucket (*Potamilus metnecktayi*) and Mexican fawnsfoot (*Truncilla cognata*) meet the Act's definition of endangered species; therefore, we are proposing to list both species as such and proposing a designation of critical habitat for both species. Both listing a species as an endangered or threatened species and designating critical habitat 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. We propose to list the Salina mucket and Mexican fawnsfoot as endangered species under the Act, and we propose to designate critical habitat for both species.

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 Salina mucket and Mexican fawnsfoot are endangered due to the following threats: habitat loss through changes in water quality and quantity, and increased fine sediments (Factor A), all of which are exacerbated by the ongoing and expected effects of climate change (Factor E). Additionally, Mexican fawnsfoot is affected by in-stream barriers to fish movement (Factor E), which limits dispersal and prevents recolonization after stochastic events.

Section 4(a)(3) of the Act requires the Secretary of the Interior (Secretary), to the maximum extent prudent and determinable, to designate critical habitat concurrent with listing. Section 3(5)(A) of the Act defines critical habitat as (i) the specific areas within the geographical area occupied by the

species, at the time it is listed, on which are found those physical or biological features (I) essential to the conservation of the species and (II) which may require special management considerations or protections; and (ii) specific areas outside the geographical area occupied by the species at the time it is listed, upon a determination by the Secretary that such areas are essential for the conservation of the species. Section 4(b)(2) of the Act states that the Secretary must make the designation on the basis of the best scientific data available and after taking into consideration the economic impact, the impact on national security, and any other relevant impacts of specifying any particular area as critical habitat.

Information Requested

We intend that any final action resulting from this proposed rule will be based on the best scientific and commercial data available and be as accurate and as effective as possible. Therefore, we request comments or information from other governmental agencies, Native American Tribes, the scientific community, industry, or any other interested parties concerning this proposed rule. We particularly seek comments concerning:

(1) These species' biology, range, and population trends, including:

(a) Biological or ecological requirements of the species, including habitat requirements for feeding, breeding, and sheltering;

(b) Genetics and taxonomy;

(c) Historical and current range, including distribution records and the locations of any additional populations of these species;

(d) Historical and current population levels, and current and projected trends; and

(e) Past and ongoing conservation measures for the species, their habitats, or both.

(2) Threats and conservation actions affecting these species, including:

(a) Factors that may be affecting the continued existence of the species, which may include habitat modification or destruction, overutilization, disease, predation, the inadequacy of existing regulatory mechanisms, or other natural or manmade factors;

(b) Biological, commercial trade, or other relevant data concerning any threats (or lack thereof) to these species; and

(c) Existing regulations or conservation actions that may be addressing threats to these species.

(3) Additional information concerning the historical and current status of these species.

(4) Specific information on:

(a) The amount and distribution of Salina mucket and Mexican fawnsfoot habitat;

(b) Any additional areas occurring within the range of these species, within the Rio Grande in Texas, that should be included in the designation because they (i) are occupied at the time of listing and contain the physical or biological features that are essential to the conservation of these species and that may require special management considerations, or (ii) are unoccupied at the time of listing and are essential for the conservation of these species;

(c) Special management considerations or protection that may be needed in critical habitat areas we are proposing, including managing for the potential effects of climate change; and

(d) Whether occupied areas are adequate for the conservation of these species, to help us evaluate the potential to include areas in the critical habitat designations that are not occupied at the time of listing. Please provide specific information regarding whether or not unoccupied areas would, with reasonable certainty, contribute to the conservation of these species and contain at least one physical or biological feature essential to the conservation of the species. We also seek comments or information regarding whether areas not occupied at the time of listing qualify as habitat for these species.

(5) Land use designations and current or planned activities in the subject areas and their possible impacts on proposed critical habitat, including information regarding the types of Federal actions that may trigger an ESA section 7 consultation and potential conservation measures to avoid and minimize impacts to the critical habitat designation that are different from those to avoid and minimize impacts to the species.

(6) Any probable economic, national security, or other relevant impacts of designating any area that may be included in the final designation, and the related benefits of including or excluding specific areas.

(7) Information on the extent to which the description of probable economic impacts in the draft economic analysis is a reasonable estimate of the likely economic impacts and any additional information regarding probable economic impacts that we should consider, including:

(a) Whether any data used in the economic analysis needs to be updated;

(b) Additional costs arising specifically from the designation of critical habitat that have not been identified in the DEA or improved cost estimates for activities that are included in the DEA;

(c) Information on the potential for incremental costs to occur outside of the section 7 consultation process. These types of costs may include triggering additional requirements or project modifications under other laws or regulations, and perceptional effects on markets; and,

(d) Information on non-Federal entities that receive Federal funding, assistance, or permits, or that otherwise require approval or authorization from a Federal agency for an action, that may be indirectly impacted by the designation of critical habitat.

(8) Whether any specific areas we are proposing for critical habitat designation should be considered for exclusion under section 4(b)(2) of the Act, and whether the benefits of potentially excluding any specific area outweigh the benefits of including that area under section 4(b)(2) of the Act. If you think we should exclude any additional areas, please provide information supporting a benefit of exclusion.

(9) Whether we could improve or modify our approach to designating critical habitat in any way to provide for greater public participation and understanding, or to better accommodate public concerns and comments.

Please include sufficient information with your submission (such as scientific journal articles or other publications) to allow us to verify any scientific or commercial information you include.

Please note that submissions merely stating support for, or opposition to, the action under consideration without providing supporting information, although noted, do not provide substantial information necessary to support a determination. Section 4(b)(1)(A) of the Act directs that determinations as to whether any species is an endangered or a threatened species must be made solely on the basis of the best scientific and commercial data available, and section 4(b)(2) of the Act directs that the Secretary shall designate critical habitat on the basis of the best scientific data available.

You may submit your comments and materials concerning this proposed rule by one of the methods listed in **ADDRESSES**. We request that you send comments only by the methods described in **ADDRESSES**.

If you submit information via *https://www.regulations.gov,* your entire submission—including any personal identifying information—will be posted

on the website. If your submission is made via a hardcopy that includes personal identifying information, you may request at the top of your document that we withhold this information from public review. However, we cannot guarantee that we will be able to do so. We will post all hardcopy submissions on *https://www.regulations.gov.*

Comments and materials we receive, as well as supporting documentation we used in preparing this proposed rule, will be available for public inspection on *https://www.regulations.gov.*

Our final determination may differ from this proposal because we will consider all comments we receive during the comment period as well as any information that may become available after this proposal. Based on the new information we receive (and, if relevant, any comments on that new information), we may conclude that one or both of these species are threatened instead of endangered, or we may conclude that one or both of these species do not warrant listing as either an endangered species or a threatened species. For critical habitat, our final designations may not include all areas proposed, may include some additional areas that meet the definition of critical habitat, or may exclude some areas if we find the benefits of exclusion outweigh the benefits of inclusion and exclusion will not result in the extinction of the species. In our final rule, we will clearly explain our rationale and the basis for our final decision, including why we made changes, if any, that differ from this proposal.

Public Hearing

Section 4(b)(5) of the Act provides for a public hearing on this proposal, if requested. Requests must be received by the date specified in **DATES**. Such requests must be sent to the address shown in **FOR FURTHER INFORMATION CONTACT**. We will schedule a public hearing on this proposal, if requested, and announce the date, time, and place of the hearing, as well as how to obtain reasonable accommodations, in the **Federal Register** and local newspapers at least 15 days before the hearing. We may hold the public hearing in person or virtually via webinar. We will announce any public hearing on our website, in addition to the **Federal Register**. The use of virtual public hearings is consistent with our regulations at 50 CFR 424.16(c)(3).

Previous Federal Actions

On June 25, 2007, we received a petition dated June 18, 2007, from Forest Guardians (now WildEarth Guardians), requesting that we list 475 species in the southwestern United States, including the Salina mucket, as endangered or threatened. On October 15, 2008, we received a petition dated October 9, 2008, from WildEarth Guardians, requesting that we list six species of freshwater mussels, including Mexican fawnsfoot, as endangered or threatened and designate critical habitat for them. On December 15, 2009, we published in the **Federal Register** (74 FR 66260) our 90-day finding that the above petitions presented substantial scientific information indicating that listing the Salina mucket and Mexican fawnsfoot may be warranted. This document constitutes our 12-month warranted petition finding for both species.

Peer Review

A species status assessment (SSA) team prepared an SSA report for the Salina mucket and Mexican fawnsfoot (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 Salina mucket and Mexican fawnsfoot SSA report (Service 2023, entire). We sent the SSA report to 10 independent peer reviewers and received three responses. Results of this structured peer review process can be found at *https://www.regulations.gov.* In preparing this proposed rule, we incorporated the results of these reviews, as appropriate, into the SSA report, which is the foundation for this proposed rule.

Summary of Peer Reviewer Comments

As discussed in Peer Review, above, we received comments from three 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 information contained in the SSA report. The peer reviewers generally concurred with our methods and conclusions presented within the draft SSA report. They provided some additional information, suggestions regarding document structure, clarifications in terminology and sources, and feedback on threats. We incorporated the majority of the substantive comments into the SSA report (Service 2023, entire) and this proposed rule. We outline the substantive comments that we did not incorporate, or fully incorporate, into the SSA report below.

(1) Comment: A peer reviewer noted that the Intergovernmental Panel on Climate Change's (IPCC's) sixth assessment report had just been released (IPCC 2021, entire) and that although the reports are likely similar, the most recent report should have been included.

Our response: When we were writing the SSA report and assigning the population condition for the Rio Grande mussels, the 2014 IPCC report (IPCC 2014, entire) was the most recent information. The climate projections in the newest report do not substantially deviate from the former report and the threat trajectories are similar to our projections. We have incorporated the latest IPCC report (IPCC 2021, entire) into this proposed rule, and we will incorporate any changes from the latest IPCC report into the SSA report before we make our final listing determinations for these species.

(2) Comment: A peer reviewer noted that if hydrologic alteration is included in the ''flowing water'' factor, and hypolimnetic releases (low water temperatures) in the ''water quality'' factor, the current condition for the upstream population of Mexican fawnsfoot would most likely be ''low'' due to impacts to hydrology and temperature from releases from Amistad Reservoir.

Our response: The populations of Mexican fawnsfoot and Salina mucket do not currently occur in stream reaches affected by the downstream effects of Amistad Reservoir. However, we agree that impacts to freshwater mussel populations are occurring due to altered hydrology and low stream temperatures caused by lake bottom releases from Amistad Reservoir. If we finalize these proposed listings, the alterations in habitat conditions in response to Amistad Reservoir operations would be considered during recovery planning efforts that focus on expanding the distribution of either, or both, species.

(3) Comment: A peer reviewer requested clarification on how we arrived at the stream-length and abundance parameter delineations for distinguishing high, moderate, low, etc., conditions. They suggested that these criteria should be based on or connected to empirical relationships between these metrics and persistence probability.

Our response: We understand that freshwater mussel populations that are more evenly distributed along longer stream reaches of a riverine system are more resilient to site-level stochastic and catastrophic events. In many instances, especially those concerning rare species in remote habitats, it would be nearly impossible to determine an exact length of stream necessary to provide the requested delineated levels of resiliency. Therefore, we relied on our best professional judgment to determine these condition levels for the identified habitat characteristics. These parameters represent our best assessment of resiliency for these species.

(4) Comment: A peer reviewer stated that there is a contradiction in how range extent is being used to measure resiliency and how redundancy is being measured in the assessment. Specifically, all Salina mucket mussel beds within a hydrologically connected stream were grouped into a single population rather than as semi-connected populations within a metapopulation that provides redundancy within the metapopulation.

Our response: For the purposes of this assessment, redundancy is measured at the species level. Redundancy is the ability of a species to withstand catastrophic events, such as no-flow or dry stream conditions or contaminant spills. A species with a single population is at higher risk of extinction if a catastrophic event occurs compared to a species with multiple, redundant populations. A species with a single population may still have limited redundancy, but if that population is sufficiently resilient and widespread (with multiple populations), then the species could have higher viability. We agree that the Salina mucket population exists somewhat as a metapopulation, where multiple mussel beds interact and provide a source of new individuals if some beds are extirpated. However, their connection to each other means they are not independent populations; redundant populations provide protection from extinction from large-scale, catastrophic events. Given there are no additional known populations outside of the one described in the SSA, the Salina mucket has no redundant populations and therefore limited redundancy. It is important to note that resiliency, redundancy, and representation inform our assessment of species' viability, and we analyze the overall risk of extinction regardless of whether we split or grouped Salina mucket into one or more populations. How we delineate populations, whether it is at the population or metapopulation scale, does not change the results of the overall viability assessment. Instead, our delineation of populations provides the basis upon which we analyze the species' status. The concept of redundancy includes consideration of a species' ability to withstand catastrophic events. Whether we called the range one population or multiple metapopulations would not change the fact that both species each only occur in one stream reach and have little to no capacity to withstand a catastrophic event within that stream reach.

(6) Comment: A peer reviewer stated that representation should be assessed in the context of the species' entire historical ranges. There is no information on genetic variation between extant and extirpated populations, but if geography is a proxy for genetic variation, the major range contractions of both species (including total disappearance from whole systems) indicates that current representation is poor.

Our response: We completed the assessment of representation in the context of the species' historical ranges. The loss of historical populations of both species means that any unique genotypes or phenotypes that may have existed historically are also lost. The individuals included within the small remaining populations for each species have likely adapted to the same suite of biological, physical, and chemical variables present within their respective geographic ranges. We agree that any additional genetic representation that historically occurred no longer exists, and we include this information in the SSA report.

I. Proposed Listing Determination

Background

General Mussel Biology

Freshwater mussels, including these two Rio Grande mussels, have a complex life history involving parasitic larvae, called glochidia, which are wholly dependent on host fish. As freshwater mussels are generally immobile, dispersal is accomplished primarily through the behavior of host fish and their tendencies to travel upstream and against the current in rivers and streams. Mussels are broadcast spawners; males release sperm into the water column, which are taken in by the female through the incurrent siphon (the tubular structure used to draw water into the body of the mussel). The developing larvae remain with the female until they mature and are ready for release as glochidia, to attach on the gills, head, or fins of fishes (Vaughn and Taylor 1999, p. 913; Barnhart et al. 2008, pp. 371–373).

Glochidia die if they fail to find a host fish, attach to the wrong species of host fish, attach to a fish that has developed immunity from prior infestations, or attach to the wrong location on a host fish (Neves 1991, p. 254; Bogan 1993, p. 599). Successful glochidia encyst (enclose in a cyst-like structure) on the host's tissue, draw nutrients from the fish, and develop into juvenile mussels (Arey 1932, pp. 214–215). The glochidia will remain encysted for about a month through a transformation to the juvenile stage. Once transformed, the juveniles will excyst from the fish and drop to the substrate.

Those juveniles that drop in unsuitable substrates die because their immobility prevents them from relocating to more favorable habitat. Juvenile freshwater mussels burrow into interstitial substrates and grow to a size that is less susceptible to predation and displacement from high-flow events (Yeager et al. 1994, p. 220). Adult mussels typically remain within the same general location where they dropped (excysted) from their host fish as juveniles.

Host specificity can vary across mussel species, which may have specialized or generalized relationships with one or more taxa of fish. Mussels have evolved a wide variety of adaptations to facilitate transmission of glochidia to host fish, including: display/mantle lures mimicking fish or invertebrates; packages of glochidia (conglutinates) that mimic worms, insect larvae, larval fish, or fish eggs; and release of glochidia in mucous webs that entangle fish (Strayer et al. 2004, p. 431). Polymorphism (existence of multiple forms) of mantle lures and conglutinates frequently exists within mussel populations (Barnhart et al. 2008, p. 383), representing important adaptive capacity in terms of genetic diversity and ecological representation.

Salina Mucket

A thorough review of the taxonomy, life history, and ecology of the Salina mucket is presented in the SSA report (Service 2023, entire). Salina mucket (*Potamilus metnecktayi*) was formally described by Richard I. Johnson with the holotype specimen collected from the Rio Salado near Nuevo Laredo, Tamaulipas, Mexico (Johnson 1998, entire). Previously, the species was recognized as *Lampsilis salinasensis* from the Salinas River, Coahuila Mexico (Dall 1908, p. 181). Later, the species was referred to as *Potamilus salinasensis,* which appears to be the first attribution of the species to the

genus *Potamilus* (Neck and Metcalf 1988, p. 265). Six species of *Potamilus* were later recognized but did not include *P. salinaensis* or *P. metnecktayi* (Turgeon et al. 1998, p. 32). Salina mucket was classified as a member of the unionid subfamily Ambleminae in 2017 (Williams et al. 2017, p. 51), which led to general consensus by the scientific community that *P. metnecktayi* is a valid taxon. The taxonomic validity of the Salina mucket was verified in 2020 (Smith et al. 2020, entire).

The Salina mucket is a medium-sized freshwater mussel with a brown, tan, or black periostracum (outermost shell surface), an ovate outline, and a somewhat inflated shell (Howells et al. 1996, p. 93; Johnson 1998, p. 430; Randklev et al. 2020a, entire). The species is sexually dimorphic with male shells being more pointed along the posterior end and females more broadly rounded and truncate. Younger individuals will occasionally have faint green rays (lines of color) on the periostracum (Johnson 1998, p. 430; Randklev et al. 2020a, entire). Mature adults can reach lengths of over 4.5 inches (120 millimeters (mm)) (Johnson 1998, p. 4301). For a more detailed description of the morphological characteristics of Salina mucket, see Howells et al. 1996 (pp. 103–104) and Randklev et al. 2020a (entire).

The Salina mucket historically occurred in the Texas portion of the Rio Grande drainage in the United States and Mexico. The species was described from the Rio Salado south of Nuevo Laredo in the State of Tamaulipas, Mexico, a tributary to the Rio Grande (Randklev et al. 2017, p. 157; Johnson 1998, entire). However, the current status of the species at its type locality in Mexico is unknown and presumed extirpated based upon the lack of recent survey observations and records of no-flow conditions and inflows of untreated household waste pollutants (Strenth et al. 2004, p. 227). Currently, the species is known to occur in a single population upstream of Amistad Reservoir in the mainstem Rio Grande (Howells et al. 1996, p. 103; Burlakova et al. 2019, p. 346; Randklev et al. 2017, pp. 157, 258).

Little reproductive information is available for the Salina mucket. Based off closely related congener species (bleufer, *P. purpuratus*), spawning is believed to occur in the fall, brooding occurs over winter, and release of glochidia occurs the following spring (Williams et al. 2008, p. 606; Haag 2012, p. 177). Therefore, the species is considered a long-term brooder (bradytictic). Host fish inoculation strategies are largely unknown for the species, but the Salina mucket may use conglutinates (packages of glochidia shaped as food items) to inoculate fish hosts similar to other *Potamilus* spp. (Barnhart et al. 2008, p. 377).

For Salina mucket, freshwater drum (*Aplodinotus grunniens*) have been identified as suitable host fish (Bosman et al. 2015, entire). However, this is the only fish species tested in laboratory experiments, and other species could serve as ecological hosts in the wild. The glochidia remain encysted for 13 to 28 days during transformation to the juvenile stage (Bosman et al. 2015, entire). Once transformed, the juveniles excyst from the fish and drop to the substrate. All species in the genus *Potamilus* have unique axe-head shaped glochidia which, unlike many other mussel species, grow in size while encysted on host fishes (Smith et al. 2020, pp. 2, 6, 10).

Longevity is not known for the Salina mucket. However, bleufer, a closely related congener species, have been reported to have a maximum lifespan of 10 years and age of maturity at 0 to 2 years, with a mean fecundity of 417,407 glochidia (Haag 2012, pp. 196, 208; Haag 2013, p. 750).

Adult Salina mucket occur in medium to large rivers, generally in nearshore habitats and crevices, undercut riverbanks, travertine shelves, and under large boulders adjacent to runs (Howells et al. 1996, pp. 103–104; Karatayev et al. 2012, p. 210; Randklev et al. 2017, pp. 157, 159; Randklev et al. 2020a, entire). Small-grained material, such as clay, silt, or sand, gathers in these crevices and provides suitable anchoring substrate. These areas are considered flow refugia from the large flood events that occur regularly in the rivers this species occupies. Salina mucket use these flow refugia to avoid being swept away as large volumes of water move through the system, as there is relatively little particle movement in the flow refugia, even during flooding (Strayer 1999, p. 472). Salina mucket need flowing water for survival and are not found in lakes, ponds, or reservoirs without flow, or in areas that are regularly dewatered. The absence of the species from lentic habitats suggests its inability to cope with impoundments and reservoirs (Randklev et al. 2020a, entire).

Little is known about the specific feeding habits of the Salina mucket. Like all adult freshwater mussels, the Salina mucket is a filter feeder, siphoning suspended phytoplankton and detritus from the water column (Yeager et al. 1994, p. 221). Juvenile mussels live in the sediment and most likely feed interstitially rather than from the water column, using the large muscular foot to sweep organic and inorganic particles found among the substrate into the shell opening (Yeager et al. 1994, pp. 220–221).

Mexican Fawnsfoot

A thorough review of the taxonomy, life history, and ecology of the Mexican fawnsfoot is presented in the SSA report (Service 2023, entire). The Mexican fawnsfoot was first described as *Unio cognatus,* from the Rio Salado, in Mexico (Lea 1860, p. 306). The species was moved to the subgenus Amygdalonaias by Simpson and then placed in the genus *Truncilla* by Frierson (Simpson 1900, p. 604; Frierson 1927, p. 89). Johnson synonymized *Truncilla cognata* as *Truncilla donaciformis* (fawnsfoot) due to morphological similarities and the holotype specimen was a heavily weathered single valve (Johnson 1999, pp. 39–40). Mexican fawnsfoot is currently classified in the unionid subfamily Ambleminae and is considered a valid taxon by the scientific community (Turgeon et al. 1998, p. 33; Williams et al. 2017, pp. 35, 44; Burlakova et al. 2019, entire; Smith et al. 2019, p. 7).

Genetic studies have been conducted for species within the genus *Truncilla.* Most notably, Mexican fawnsfoot was recognized as genetically distinct from other *Truncilla* species (Smith et al 2019, p. 7; Burlakova et al. 2019, entire). However, the genetic diversity within the species is unknown, as only a limited number of individuals have been analyzed.

The Mexican fawnsfoot is a small-sized freshwater mussel with a yellow to green periostracum and faint chevron-like markings, an elongate outline, and laterally inflated shell (Lea 1860, pp. 368–369; Randklev et al. 2020b, entire). For a more detailed description of the morphological characteristics of Mexican fawnsfoot, see Howells et al. 1996 (pp. 139–140).

The Mexican fawnsfoot historically occurred in the lower Rio Grande drainage in Texas and Mexico. The holotype specimen was described from the Rio Salado, Mexico (State of Nuevo León); however, the species is presumed extirpated in Mexico based on surveys conducted in the early 2000s and in 2017, which found suitable habitat but no live individuals or shell material of the species (Service 2023, pp. 25–26; Hein et al. 2017, entire).

Mussels in the genus *Truncilla* have miniaturized glochidia and use molluscivorous freshwater drum as hosts (Barnhart et al. 2008, p. 373;

Smith et al. 2019, p. 6). The primary host fishes for the Mexican fawnsfoot are unknown; however, based on other species in the genus *Truncilla,* they are likely freshwater drum specialists (Haag 2012, pp. 178–179; Sietman et al. 2018, pp. 1–2; Smith et al. 2019, p. 6). To date, no empirical laboratory studies have tested host fishes for the Mexican fawnsfoot.

The Mexican fawnsfoot's reproductive strategy (*e.g.,* mantle lures or conglutinates) is unknown. Some researchers have postulated that some female mussels of genus *Truncilla* allow themselves to be depredated (female self-sacrifice) by freshwater drum to infest the host fish (Haag 2012, pp. 178–179). However, this fails to explain the reproductive strategy of larger females that exceed the size range capable of being ingested by a freshwater drum or other potential host fish species (Sietman et al. 2018, p. 2). Therefore, it is possible that secondary reproductive strategies, such as broadcast of free glochidia or cryptic lures may become the primary method of glochidia dispersal (Haag 2012, p. 179).

Longevity is not known for the Mexican fawnsfoot. However, congener species in the genus *Truncilla* from the southeastern United States have been reported to reach a maximum lifespan of 8 to 18 years (Haag and Rypel 2011, pp. 4–6; Sietman et al. 2018, p. 1). The Mexican fawnsfoot likely has a similar maximum lifespan.

Adult Mexican fawnsfoot occur in medium to large rivers, in or adjacent to riffle and run habitats as well as in stream bank habitats (Karatayev et al. 2012, p. 211; Randklev et al. 2017, pp. 221–234; Randklev et al. 2020b, entire). Small-grained material, such as clay, silt, or sand, gathers in these crevices and provides suitable anchoring substrate. These areas are considered flow refugia from the large flood events that occur regularly in the rivers this species occupies. Mexican fawnsfoot use these flow refugia to avoid being swept away as large volumes of water move through the system, as there is relatively little particle movement in the flow refugia, even during flooding (Strayer 1999, p. 472). However, many of the riffle and near-shore deposition areas occupied by Mexican fawnsfoot are bathymetric high points in a river system and are subject to exposure at reduced flow rates before the stream completely ceases to flow (Brewster 2015, p. 22). Mexican fawnsfoot need flowing water for survival and are not found in lakes, ponds, or reservoirs (Randklev et al. 2020b, entire).

Little is known about the specific feeding habits of the Mexican fawnsfoot, but like the Salina mucket, it is a filter feeder, siphoning suspended phytoplankton and detritus from the water column (Yeager et al. 1994, p. 221).

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. In 2019, jointly with the National Marine Fisheries Service, the Service issued a final rule that revised the regulations in 50 CFR part 424 regarding how we add, remove, and reclassify endangered and threatened species and the criteria for designating listed species' critical habitat (84 FR 45020; August 27, 2019). On the same day, the Service also issued final regulations that, for species listed as threatened species after September 26, 2019, eliminated the Service's general protective regulations automatically applying to threatened species the prohibitions that section 9 of the Act applies to endangered species (84 FR 44753; August 27, 2019).

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. The term ''foreseeable future'' extends only so far into the future as we can reasonably determine that both the future threats and the species' responses to those threats are likely. In other words, the foreseeable future is the period of time in which we can make reliable predictions. ''Reliable'' does not mean ''certain''; it means sufficient to provide a reasonable degree of confidence in the prediction. Thus, a prediction is reliable if it is reasonable to depend on it when making decisions.

It is not always possible or necessary to define the foreseeable future as a particular number of years. Analysis of the foreseeable future uses the best scientific and commercial data available

and should consider the timeframes applicable to the relevant threats and to the species' likely responses to those threats in view of its life-history characteristics. Data that are typically relevant to assessing the species' biological response include species-specific factors such as lifespan, reproductive rates or productivity, certain behaviors, and other demographic factors.

Analytical Framework

The SSA report (Service 2023, entire) documents the results of our comprehensive biological review of the best scientific and commercial data regarding the status of these 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 proposed for listing as 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 the viability of the Salina mucket and Mexican fawnsfoot, 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 each of the species arrived at its current condition. The final stage of the SSA involved making projections about the species' responses to positive and negative environmental and anthropogenic influences. Throughout all of 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 decisions.

The following is a summary of the key results and conclusions from the SSA report; the full SSA report can be found at Docket No. FWS–R2–ES–2023–0026 on *https://www.regulations.gov* and at *https://www.fws.gov/library/collections/proposed-endangered-species-status-salina-mucket-and-mexican-fawnsfoot.*

Summary of Biological Status and Threats

In this discussion, we review the biological condition of the species and their resources, and the threats that influence the species' current and future conditions in order to assess the species' overall viability and the risks to that viability. We also considered a range of plausible future scenarios on the future viability of both species within the SSA report (Service 2023, pp. 60–86), but do not address them further in this proposed rule.

Historical Range and Distribution

Salina Mucket

The Salina mucket is native to the Rio Grande (known in Mexico as the Rio Bravo) drainage in Texas and northern Mexico. The Salina mucket historically occupied approximately 734 river miles (rmi) (1,181 river kilometers (rkm)) in the United States and Mexico and is presumed extirpated from approximately 82 percent of the species' known historical distribution (Karatayev et al. 2015, p. 7).

In the Rio Grande system, the Salina mucket historically occurred from the confluence of the Rio Conchos with the Rio Grande (Presidio County, Texas) to downstream just below the current location of Falcon Dam (Starr County, Texas). This stretch of occupied stream accounted for a total of approximately 686 rmi (1,104 rkm) in the mainstem Rio Grande (Johnson 1998, p. 433; Howells et al. 1996, pp. 103–104; Karatayev et al. 2012, pp. 210–211; Randklev et al. 2017, p. 157; Randklev et al. 2018, p. 135; Randklev et al. 2020a, entire). Additionally, the species historically occurred in the lower Pecos River to approximately 1 rmi (1.6 rkm) upstream of the river's confluence with the Rio Grande. However, the Pecos River population is now considered extirpated, as the last live individual was encountered in the 1960s and the lower portion of the Pecos River is now inundated by Amistad Reservoir. Possible recent reports of the species from the Pecos and Devils Rivers remain unconfirmed and are likely misidentified bleufer or Tampico pearlymussel (*Cyrtonaias tampicoensis*), which can have a similar appearance to Salina mucket.

With no live collections from the Rio Grande having occurred since the early 1970s (Howells 2002, p. ii; Miller 2020, pers. comm.), Salina mucket were believed extirpated entirely from Texas until 2003, when the species was rediscovered upstream of Amistad Reservoir (Howells 2003, p. ii; Randklev et al. 2017, p. 157). Long dead, sub-fossil shells have been encountered below Amistad Reservoir in the lower Rio Grande; however, no live individuals have ever been reported below Amistad Reservoir (Karatayev et al. 2012, p. 211; Randklev et al. 2017, p. 157; Miller 2020, pers. comm.).

Based on the species' description (Johnson 1998, p. 429), we conclude the lower Rio Salado, a Rio Grande tributary partially located in the Mexican state of Tamaulipas, was historically occupied by Salina mucket in approximately the lower 48 rmi (77 rkm) before the river's confluence with the Rio Grande. The Don Martin dam project on the Rio Salado started in 1927 and was completed sometime in the early 1930s (Garza 2016, entire). This impoundment in the Mexican State of Coahuila would have likely extirpated or fragmented any historical populations farther upstream in the Rio Salado basin as the species is not found in still water. Surveys of the upper reaches of the Rio Salado and its tributaries in the north-central Coahuila completed in 2001, 2002, and 2017 did not result in the collection of any live Salina mucket. No known records exist for Salina mucket from other tributaries to the Rio Grande in the United States or Mexico. As such, the historical range as described above is thought to be accurate.

Rio Grande—Lower Canyons: The only known remaining population of Salina mucket is located in the Lower Canyons of the Rio Grande just downstream of Big Bend National Park, in Brewster, Terrell, and Val Verde Counties, Texas. Between 2003 and 2008, 19 live Salina mucket were found at one site near Dryden, Texas (Karatayev et al. 2012, p. 210). Shell material from Salina mucket was found at an additional 7 sites (n = 159 shells) (Karatayev et al. 2012, p. 210). Salina mucket was the rarest mussel species encountered during the study, which surveyed over 160 sites throughout the Rio Grande from Terrell County to Starr County (Karatayev et al. 2012, p. 210).

Subsequent surveys conducted in 2014 and 2015 confirmed the presence of Salina mucket in the same general reach of the Lower Canyons (n = 22 sites) with 92 live individuals found at 22 of 114 sites (Randklev et al. 2017, pp. 154–174). The surveys in 2014 and 2015 were also the first live report of a Salina mucket in Brewster County, Texas, the farthest observed upstream locality for the species (Randklev et al. 2017, p.159). Measured shell lengths of observed live Salina mucket indicated the presence of mostly older individuals. However, the presence of some smaller individuals indicated somewhat recent recruitment (Randklev et al. 2017, p. 159).

Individual mussel beds in the Lower Canyons vary in density, with the densest sites near San Francisco Creek and Johns Marina in Terrell County, Texas, and sites with lower densities located upstream of the San Francisco Creek confluence and downstream of Johns Marina sites (Randklev et al. 2017, p. 168).

The Lower Canyons reach extends for approximately 127 rmi (204 rkm) below Big Bend National Park through private lands along the U.S.-Mexico border. This reach of the Rio Grande is largely spring-fed, with significant spring-flow inputs occurring upstream of the confluence of San Francisco Creek (Donnelly 2007, p. 3; Bennett et al. 2009, p. 1). The area was designated a National Wild and Scenic River in 1978 (Garrett and Edwards 2004, p. 396), which affords some protection from Federal development projects, but the designation does not limit State, local, or private development (National Wild and Scenic Rivers System 2021, p. 1). Urban and agricultural land use in the Lower Canyons reach is minimal, and most land in the watershed is undeveloped (Plateau Water Planning Group 2020, pp. 1–9–1–10; Far West Texas Water Planning Group 2020, pp.1–13–1–14). The Lower Canyons reach is characterized by swift rapids interspersed by pools, often bounded by high canyon walls (Garrett and Edwards 2004, p. 396), and transitions into slow-moving, impounded waters at the inflow areas to Amistad Reservoir, which was constructed in 1969.

Rio Grande—Downstream of Amistad Reservoir: No live Salina mucket have been found in any surveys of the Rio Grande downstream of Amistad Reservoir (*e.g.,* Howells et al. 1996, pp. 103–104; Karatayev et al. 2012, pp. 210–211; Randklev et al. 2017, p. 157). However, Salina mucket sub-fossil shell material has been found in this portion of the basin, and that shell evidence suggests that, at one time, a large, widespread population of Salina mucket likely occurred there (Karatayev et al. 2012, pp. 210–211).

Ongoing development and water management likely prohibit Salina mucket from occupying reaches downstream of Amistad Reservoir. The Rio Grande in the Laredo area is heavily influenced by development along the U.S.-Mexico border. Rapid human population growth, as well as industrialization on the Mexican side of the river, has stressed the existing wastewater treatment facilities, resulting in a high sedimentation load and impaired water quality in the Rio Grande (Texas Clean Rivers Program 2013, pp. 7–9). In addition, flows are regulated by releases from Amistad Reservoir based on hydropower generation and water deliveries for downstream irrigation needs (Texas Water Development Board 2021, p. 1). These water diversion and delivery projects have resulted in substantial daily variation in stream discharge and depth (Randklev et al. 2018, p. 734).

Rio Salado Basin: The Salina mucket historically occurred in the Rio Salado basin in Mexico. Rio Salado and several of its tributaries were surveyed in the early 2000s, resulting in several recently dead mussel shells collected in 2001 and 2002 in the Rio Sabinas (Strenth et al. 2004, p. 225). The surveyed portions of the Rio Sabinas riverbed were reported to be dry with no evidence of recent water flow or live Salina mucket.

In the mainstem Rio Salado, no living mussels or shells encountered during this survey were identified as Salina mucket (Strenth et al. 2004, entire). As with the Rio Sabinas, the river exhibited no flow, and at one site, household waste was reported. These rivers, and many others in this region of Mexico, are losing flow and since the mid-1990s have become dry or intermittent (Contreras-B. and Lozano-V. 1994, p. 381).

In 2017, four sites in the Rio Salado system were visited, including the Rio Salado, Rio Sabinas, Rio San Rodrigo, and Rio Nadadores (Hein et al. 2017, entire). While these surveys focused on locating Texas hornshell (*Popenaias popeii*), the areas surveyed were within the Salina mucket's historical habitat. Several of the locations in the Rio Sabinas contained suitable habitat for the Salina mucket, including flowing water; however, these surveys provided no live or shell evidence of Salina mucket. Therefore, for the purposes of our analysis, Salina mucket is considered functionally extirpated from the Rio Salado and its tributaries.

Mexican Fawnsfoot

The Mexican fawnsfoot is native to the Rio Grande drainage in Texas and northern Mexico. Mexican fawnsfoot historically occurred in the Rio Grande from approximately the confluence of the Pecos River with the Rio Grande (Val Verde County, Texas) to downstream just below the current location of Falcon Dam (Starr County, Texas). This represents approximately 340 rmi (547 rkm) of historically occupied river. The Mexican fawnsfoot may have occupied the lower section (approximately 1 rmi (1.6 rkm)) of the Pecos River (Metcalf 1982, p. 52); however, inundation by Amistad Reservoir in the late 1960s, and subsequent changes in hydrology, temperature, and sedimentation, likely made that habitat unsuitable for Mexican fawsnfoot and extirpated any population there.

Based on species' descriptions (Lea 1860, pp. 368–369; Johnson 1999, pp. 38–40, 64), we infer the lower Rio Salado was historically occupied by the Mexican fawnsfoot in the Mexican State of Nuevo León in the lower 48 rmi (77 rkm) before its confluence with the Rio Grande. However, the exact collection location of the holotype specimen is unknown. The Don Martin dam project in Coahuila and subsequent changes in hydrology, temperature, and sedimentation, as well as barriers to host fish passage, would have likely extirpated or fragmented any historical populations farther upstream in the Rio Salado basin. No other known records exist for Mexican fawnsfoot from other tributaries to the Rio Grande in the United States or Mexico. As such, the historical range, as described above, is thought to be accurate.

Amistad Reservoir: There are very few reports of Mexican fawnsfoot in the reach of the Rio Grande near Del Rio, Texas (around the current location of Amistad Reservoir), likely due to upstream and downstream effects of Amistad Dam. Mexican fawnsfoot were collected from the Rio Grande near Del Rio, Texas, in 1972 (Howells et al. 1997, p. 123). However, subsequent surveys of that stream reach have yielded no Mexican fawnsfoot, live or dead, in either the upstream or downstream vicinity of Amistad Reservoir (Randklev et al. 2017, p. 221). Consequently, it is unlikely that this reach is inhabited by a substantial population of Mexican fawnsfoot, and any historical population that inhabited this reach was likely extirpated by either the construction and filling of Amistad Reservoir in the late 1960s or the subsequent changes in hydrology, temperature, and

sedimentation that occurred as a result of Amistad Dam.

Rio Grande—Downstream of Amistad Reservoir: The only remaining Mexican fawnsfoot population occurs from approximately Eagle Pass, Texas, downstream to San Ygnacio, Texas (referred to below as the Laredo reach), for a total of approximately 184 rmi (296 rkm) (Randklev et al. 2017, p. 221). Falcon Dam, completed in 1954, likely caused the extirpation of Mexican fawnsfoot in the 40-rmi (64-rkm) length of river inundated by the impoundment due to changes in hydrology, temperature, and sedimentation (Randklev et al. 2017, p. 176). Mexican fawnsfoot were believed extirpated from Texas, as no live or dead individuals were found from 1972 to 2003, until a single live individual was located in Webb County, Texas, in 2003 (Howells 2001, entire; Howells 2004, p. 35; Randklev et al. 2020b, entire). During extensive surveys between 2001 and 2011 throughout the Rio Grande drainage, only 19 live Mexican fawnsfoot were located from Laredo and Webb Counties, Texas. No live individuals were found downstream of the Laredo South Side wastewater treatment plant in Laredo, Texas; however, fresh dead (still containing soft tissue) Mexican fawnsfoot were located in Zapata County, Texas. Of the live individuals encountered, shell size ranged from 0.8 to 1.3 inches (20.5 to 33 mm) (Karatayev et al. 2012, p. 211). In another study, 213 live Mexican fawnsfoot were reported from 30 of 114 sites surveyed in the Rio Grande basin (Randklev et al. 2017, p. 223). Researchers noted that live individuals were found primarily in Webb and Zapata Counties and upstream of Falcon Lake (Randklev et al. 2017, p. 224).

As stated above under *Rio Grande—Downstream of Amistad Reservoir* for the Salina mucket, the Rio Grande in the Laredo area is influenced by development, high sedimentation, regulated flows, and water diversions, all of which have affected water quality and quantity and thus affected the Mexican fawnsfoot population in this reach.

Rio Salado Basin: The Mexican fawnsfoot historically occurred in the Rio Salado basin; however, the current status of the population remains unknown and is likely extirpated (Burlakova et al. 2019, p. 346). The Rio Salado, Rio Sabinas, and several other tributaries were surveyed in the early 2000s. The surveyed portions of river were reported to be dry with no indicators of recent stream flow. No evidence of Mexican fawnsfoot, either through the observation of live individuals or collection of shell material, was reported.

In 2017, four sites in the Rio Salado system were visited, including the Rio Salado, Rio Sabinas, Rio San Rodrigo, and Rio Nadadores (Hein et al. 2017, entire). While several of the locations contained apparently suitable habitat, including flowing water, no live Mexican fawnsfoot or shell material were found at any location during these surveys. Therefore, for the purposes of our analysis, Mexican fawnsfoot is considered functionally extirpated from the Rio Salado and its tributaries.

Species Needs

Resiliency

For the Rio Grande mussels to maintain viability, their populations or some portion thereof must be sufficiently resilient. Stochastic events that have the potential to affect their populations include high-flow events, drought, pollutant discharge, and accumulation of fine sediment. Multiple demographic factors, including occupied stream length, abundance, and recruitment, influence the resiliency of populations. Those factors, in turn, are influenced by the availability of important habitat features such as suitable substrate, flowing water, and good water quality. Both the demographic factors and the availability of important habitat features determine the resiliency of Salina mucket and Mexican fawnsfoot populations.

Occupied Stream Length—Most freshwater mussels are found in aggregations, called mussel beds, that can vary in size from less than 50 to greater than 5,000 square meters (m^2), and are separated by stream reaches in which mussels are absent or rare (Vaughn 2012, p. 983). For each of the Rio Grande mussels, a population is a collection of mussel beds within a hydrologically connected stream reach through which infested host fish may travel. This connection allows for ebbs and flows in mussel bed occupancy, distribution, and abundance throughout the stream reach. Therefore, sufficiently resilient populations must occupy stream reaches long enough such that stochastic events that affect individual mussel beds do not eliminate the entire population. Repopulation by infested fish from other source mussel beds within the reach can allow the population to recover from these events.

Abundance—For populations to be adequately resilient, there must be many mussel beds of sufficient density such that local stochastic events do not necessarily eliminate all individuals from the bed(s), allowing the mussel bed(s) and the overall population in the stream reach to recover from any one event.

Reproduction—Adequately resilient mussel populations must reproduce and recruit young individuals into the reproducing population. Population size and abundance reflect previous influences on the population and habitat and provide a current ''snapshot'' of the population, while reproduction and recruitment reflect stable, increasing, or decreasing population trends that reflect the future viability of the population. For example, a large, dense population of freshwater mussels that contains mostly older individuals and lacks younger individuals is not likely to remain large and dense into the future, as there are few young individuals to sustain the population over time. Conversely, a population that is less dense but has many young and/or gravid individuals may be likely to maintain or increase in density in the future as younger individuals mature and boost the reproductive capacity of the population. For the purposes of the SSA report (Service 2023, pp. 31–51), we considered populations with three or more distinct age classes highly resilient. Age classes are defined as multiple individuals within a similar shell size length, which indicates that multiple individuals are part of the same cohort or reproductive event.

Substrate—Salina mucket occur in flow refuges such as crevices, undercut riverbanks, travertine shelves, large boulders, and near-shore deposition areas such as banks, point bars, and backwater pools. These refuges must have seams of clay or other fine sediments within which the mussels may anchor, but not so much excess sediment that the mussels are smothered.

Mexican fawnsfoot occur primarily in riffles as well as near-shore depositional habitats. Habitats with clean-swept substrate with seams of fine sediments are considered to have suitable substrate, and those with copious fine sediment both in crevices and on the stream bottom are considered less suitable.

Flowing Water—Freshwater mussels need flowing water for survival. The Rio Grande mussels are not found in lakes or in pools without flow, or in areas that are regularly dewatered (Randklev et al. 2020a, entire; Randklev et al. 2020b, entire). Therefore, stream reaches with continuous flow are considered suitable habitat, while those with little or no flow (caused either by dewatering or impoundment) are considered not suitable. Freshwater mussels are

sensitive to changes in flow rate. However, no empirical studies of flow requirements for the Rio Grande mussels have been conducted.

Water Quality—Freshwater mussels, as a group, are sensitive to changes in water quality parameters such as dissolved oxygen, salinity, ammonia, and pollutants. Habitats within the unique tolerance limits of resident mussel species are considered suitable, while those habitats with levels outside of those tolerance limits are considered less suitable. No empirical studies of water quality tolerances for the Rio Grande mussels have been conducted.

Representation

Maintaining representation in the form of genetic or ecological diversity is important to maintain the Rio Grande mussels' capacity to adapt to future environmental changes. Mussels need to maintain populations throughout their ranges to retain the genetic variability and life-history attributes that can buffer the species' response to environmental changes over time (Jones et al. 2006, p. 531). The Rio Grande mussels each have likely lost genetic diversity as populations have been extirpated throughout their ranges. Consequently, retaining the remaining representation in the form of genetic diversity is likely critical to the species' capacity to adapt to future environmental change.

Redundancy

The Rio Grande mussels need multiple, sufficiently resilient populations distributed throughout their ranges to provide for redundancy. The more populations, and the wider the distribution of those populations, the more redundancy the species will exhibit. Redundancy reduces the risk that a large portion of the species' range will be negatively affected by a catastrophic natural or anthropogenic event at a given point in time. Species that are well-distributed across their historical range are less susceptible to extinction and more viable than species confined to a small portion of their range (Carroll et al. 2010, entire; Redford et al. 2011, entire). Historically, most Rio Grande mussel populations were likely connected by fish migration throughout the Rio Grande, upstream through the Pecos River, and throughout Rio Grande tributaries in the United States and Mexico. However, due to impoundments and river reaches with unsuitable water quality (*e.g.,* high salinity), populations have become isolated from one another, and repopulation of extirpated locations is unlikely to occur without human assistance.

Threats

We reviewed the potential threats that could be affecting the two Rio Grande mussel species now and in the future. In this proposed rule, we will discuss only those factors in detail that could meaningfully impact the status of the species. Those risks that are not known to have effects on Rio Grande mussel populations, such as disease, are not discussed here but are evaluated in the SSA report (Service 2023, entire). Many of the threats and risk factors are the same or similar for both species. Where the effects are expected to be similar, we present one discussion that applies to both species. Where the effects may be unique to or different for one species, we address that specifically. The primary threats affecting the status of the Rio Grande mussels are: Increased fine sediment (Factor A from the Act), changes in water quality (Factor A), altered hydrology in the form of loss of flow (Factor A), and specific to the Mexican fawnsfoot, barriers to fish movement (Factor E). These factors are all exacerbated by the ongoing and expected effects of climate change (Factor E). Finally, we also reviewed the conservation efforts being undertaken for the species.

Increased Fine Sediment

Freshwater mussels require specific stream substrates (*e.g.,* silt, sand, gravel, and larger cobbles) in order to anchor themselves into place in the streambed. Interstitial spaces (small openings between rocks and gravels) in the substrate provide essential habitat for juvenile mussels. Juvenile freshwater mussels burrow into interstitial substrates, making them particularly susceptible to degradation of this habitat feature. When clogged with sand or silt, interstitial flow rates and spaces may become reduced, thus reducing juvenile habitat availability and survivorship (Brim Box and Mossa 1999, p. 100). Excessive fine sediments can also embed in larger crevices, potentially causing a change in overall substrate composition and even leading to smothering of adult or juvenile mussels that occupy those spaces.

Under natural conditions, fine sediments collect on the streambed and in crevices during low-flow events. Much of the accumulated sediment is dislodged and washed downstream during high-flow events (also known as cleansing flows). However, the increased frequency and duration of low-flow events (from groundwater extraction, instream surface flow diversions, or drought, such as drought caused by climate change) combined with a decrease in cleansing flows (from reservoir management and drought) and the presence of giant cane (*Arundo donax*), which can alter stream hydrology and morphology by retaining sediments and channeling flows (Yang et al. 2011, p. 1), have likely caused sediment to accumulate in excess of historical quantities in stream reaches occupied by both species of Rio Grande mussels, especially in bank habitats in areas occupied by Salina mucket. When water velocity decreases, which can occur from reduced streamflow or inundation, water loses its ability to mobilize sediment and carry it in suspension. This sediment can fall to the substrate and lead to the smothering of mussels that cannot adapt to softer or finer substrates (Watters 2000, p. 263). Furthermore, increased sediment accumulation resulting from altered hydrology can be exacerbated by a simultaneous increase in the number of sources of fine sediment in a watershed. In the range of the Rio Grande mussels, additional sources of fine sediment include, but are not limited to, streambank erosion from agricultural activities, livestock grazing, roads, border maintenance (*e.g.,* boat ramp and road maintenance), and climate change.

Potential changes in climate, like a higher frequency of drought with periodic intense rain events, can alter sediment load and sediment distribution (Allen et al. 2011, entire; EPA 2022, entire). Due to reduced vegetative cover and higher soil erodibility, high intensity rainfall during a drought period can more efficiently dislodge and transport sediment, which later settles in rivers and streambeds.

Water Quality Impairment

Water quality can be impaired through contamination or by alteration of naturally occurring water chemistry. Chemical contaminants are ubiquitous throughout the environment and are a major reason for the current declining status of freshwater mussel species nationwide (Augspurger et al. 2007, p. 2025). Chemicals enter the environment through both point and nonpoint discharges, including spills, industrial sources, municipal effluents, and agricultural runoff. These sources contribute organic compounds, heavy metals, pesticides, herbicides, and a wide variety of newly emerging contaminants to the aquatic environment. Ammonia is of particular concern below agricultural areas and water treatment plant outfalls as freshwater mussels can be particularly sensitive to increased ammonia levels at all life stages; juveniles are especially

sensitive (Augspurger et al. 2003, p. 2569). Elevated levels of ammonia are likely the reason that Mexican fawnsfoot are not found for many miles downstream of multiple wastewater treatment plants that discharge into the Rio Grande from both the United States and Mexico near Nuevo Laredo (Karatayev et al. 2015, p. 9). Similarly, increased nutrients and heavy metals contained in inflows from the Rio Conchos, combined with reduced flow, have resulted in heavier concentrations of contaminants, which have influenced the distribution of Salina mucket (Rubio-Arias et al. 2010, pp. 2074–2081).

An additional type of water quality impairment is alteration of water quality parameters like dissolved oxygen, temperature, or salinity. Because surface runoff or wastewater effluent frequently include decomposing organic materials, dissolved oxygen may be reduced by increased nutrient inputs from these sources (American Public Health Association 1992, entire). Juvenile freshwater mussels are particularly sensitive to low dissolved oxygen (Sparks and Strayer 1998, pp. 132–133).

Increases in water temperature due to climate change and low-flow conditions during drought can exacerbate the effects of low dissolved oxygen levels by further reducing dissolved oxygen within the waterbody and increasing freshwater mussel oxygen consumption rates. Additionally, elevated water temperatures can have their own direct metabolic effects on both juvenile and adult mussels by affecting their available energy for maintenance, growth, and reproduction (Ganser et al. 2013, p. 1169).

Finally, salinity can also limit mussel abundance and distribution (Haag 2012, p. 330; Johnson et al. 2018, entire), including that of Salina mucket. Inflows from the Rio Conchos, Mexico, the primary source of instream flows entering the Rio Grande approximately 125 river miles (201 rkm) upstream of the known remaining population of Salina mucket, contribute significantly to base flow in the Rio Grande upstream of Amistad Reservoir. The Rio Grande average daily flow rate has been reported at 140 cubic feet per second (cfs) above the Rio Conchos confluence and 990 cfs downstream (Ward 2017, pp. 5–6). Spring inputs also account for some of the increases in riverine base flow. Based off U.S. International Boundary and Water Commission (USIBWC) gauge data, overall riverine flow increases as much as 60 percent due to spring water inputs throughout the Lower Canyons stretch of the Rio Grande (Brauch 2012, p. 4). This reach of the Rio Grande is occupied by the upstream portion of the known remaining population of Salina mucket. However, the spring inputs are often saline and thermal (hot water) and contribute to elevated salinity in the Lower Canyons of the Rio Grande (Urbanczyk and Bennett 2017, entire). Persistent inflows from the Rio Conchos are likely critical to maintaining appropriate salinity levels for the Salina mucket (Urbanczyk and Bennett 2017, p. 16). Additionally, aquifers have become increasingly saline due to salinized water recharge. Water management in the Pecos River, a Rio Grande tributary, has led to reduced flood frequency and magnitude, diminished stream flows, increased evapotranspiration, and increased prevalence of saline groundwater that has resulted in increased salinization (Hoagstrom 2009, entire). Irrigation return-flows exacerbate increasing salinity levels as salts build up on irrigated land and then are washed into the Rio Grande and its tributaries.

A reduction in surface flow from drought, instream diversion, or groundwater extraction concentrates contaminant and salinity levels, increases water temperatures in streams, and exacerbates detrimental effects to the Rio Grande mussels.

Loss of Flowing Water

The Rio Grande mussels need flowing water to survive. Low-flow events (including stream drying) and inundation can eliminate appropriate habitat conditions for both species, and while the species may survive these events if they are short in duration, populations will not persist if they experience these conditions frequently or continuously.

Inundation has primarily occurred in the Rio Grande basin upstream of dams, both large (*e.g.,* Amistad and Falcon) and small (*e.g.,* water weir barriers built across the stream to control or slightly raise upstream water levels and diversion dams, such as those in the Rio Grande below Amistad). Inundation causes an increase in sediment deposition, eliminating interstitial spaces both mussel species need to anchor themselves and for juvenile growth. In large reservoirs, deep water is very cold and often devoid of oxygen and necessary nutrients. Cold water (less than 11 degrees Celsius (°C) (52 degrees Fahrenheit (°F))) has been shown to stunt mussel growth and delay or hinder spawning (Galbraith and Vaughn 2009, p. 45). Because glochidial release may be temperature dependent, it is likely that relict individuals living in the constantly cold hypolimnion (deepest portion of the reservoir) in these reservoirs may never reproduce or will reproduce less frequently (Khan et al. 2019, entire). Because inundation of occupied habitats is detrimental to the survival of both Rio Grande mussels from both a short-term survival perspective and a long-term reproductive potential perspective, neither species is considered tolerant of reservoir habitat (Randklev et al. 2020a entire; 2020b, entire).

Very low water levels are detrimental to the Rio Grande mussels as well. Recent droughts have led to extremely low flows in rivers across the desert Southwest. The areas inhabited by the Rio Grande mussels have some resiliency to drought because they are partially spring-fed (*e.g.,* Salina mucket in the Lower Canyons of the Rio Grande), or have managed flow from major reservoirs (*e.g.,* Mexican fawnsfoot downstream of Amistad). However, streamflow in the Rio Grande downstream of the confluence with the Rio Conchos (near the Lower Canyons of the Rio Grande) has been declining since the 1980s (Miyazono et al. 2015, p. A–3). Overall river discharge for the Rio Grande is projected to continue to decline due to increased drought as a result of climate change (Nohara et al. 2006, p. 1087). In addition to increasingly common and extended low-flow conditions, climate change will also bring higher air temperatures and increased evaporation, which will further imbalance the supply and demand for water. Increased groundwater pumping and resultant aquifer shortages, as well as regulated reservoir releases, may lead to lower river flows of longer duration than have been recorded in the past.

The Lower Canyons is very incised, and the Salina mucket occurs in crevices along the steep banks. Reductions in discharge in this area may lead to a higher proportion of the population being exposed than similar decreases experienced by other mussel species inhabiting the reach. Mexican fawnsfoot inhabits riffle and near-shore depositional areas; both areas are bathymetric high points in a river system. Therefore, decreased flows will likely lead to greater exposure of these habitats in both area and duration during drought and low flows. Since the habitats occupied by the Mexican fawnsfoot are high points in the river system, during periods of low flow, terrestrial predators have increased access to portions of the river that are otherwise too deep and inaccessible under normal flow conditions, which results in increased predation on the Mexican fawnsfoot.

As spring and riverine flows decline due to drought or dropping water tables due to groundwater pumping, the habitat that can be occupied by the Rio Grande mussels could be further reduced and could eventually cease to exist. While these species may survive short periods of low-flow conditions, as low flows persist, mussels face increased risks due to oxygen deprivation, increased water temperature, and, ultimately, stranding, reducing survivorship, reproduction, and recruitment in the population.

Barriers to Fish Movement

The natural ranges of the Rio Grande mussels historically extended throughout the mainstem Rio Grande and select major tributaries in Texas and Mexico. The overall distribution of mussels is, in part, a function of the dispersal of their host fish. Mussels colonize new areas through movement of infested host fish, and newly metamorphosed juveniles excysting from host fish into suitable habitats in new locations.

Today, each mussel species has only a single remaining population, and mussels are distributed unevenly within each. This range restriction has greatly reduced the species' abilities to recolonize new areas, expand their current ranges, and maintain more distant mussel beds through fish host movement. The Rio Grande mussels do not have multiple, sufficiently resilient populations to provide redundancy and serve as sources to restore populations eliminated due to catastrophic events.

Over time, by preventing fish passage, impoundments can lead to genetic isolation between individual populations throughout the species' ranges. These small, isolated populations are susceptible to genetic drift (random loss of genetic diversity) and inbreeding depression. This can make the species less adaptable and less resilient to changing environmental conditions. The Rio Grande mussels do not have additional populations to provide redundancy and serve as sources to restore genetic variability if the remaining population experiences genetic drift or inbreeding depression. Additionally, because each of the Rio Grande mussels only exists in a single, remaining population, any representation that historically occurred for each species through the existence of multiple populations in the Rio Grande and its tributaries has been lost.

The Rio Grande mussels' primary host fish species, freshwater drum, are known to be a common and widespread species. We do not expect the distribution or abundance of the host fish itself to be a limiting factor for the Rio Grande mussels. There are no known fish host barriers within the range of the Salina mucket; therefore, we do not consider fish movement to be a stressor for that species. However, there are multiple low water weirs and other potential host fish barriers across the range of the Mexican fawnsfoot. In addition to existing barriers, new construction may further restrict host fish movement. One low-water weir has been proposed for construction near Laredo, Texas, which would likely restrict host fish passage between mussels on the up and downstream sides of the structure, resulting in genetic isolation. The low-water weir would also eliminate about 7 percent of remaining occupied habitat for the Mexican fawnsfoot.

Climate Change

Climate change has already begun, and continued greenhouse gas emissions at or above current rates will cause further warming (Intergovernmental Panel on Climate Change (IPCC) 2021, pp. 12–16). Warming in the Southwest is expected to be greatest in the summer, and annual mean precipitation is very likely to decrease in the Southwest (Ray et al. 2008, p. 1). In Texas, the number of extreme hot days (high temperatures exceeding 95 °F) are expected to double by around 2050 (Kinniburgh et al. 2015, p. 83). Texas is considered one of the ''hotspots'' of climate change in North America with west Texas highlighted as an area that is expected to show greater responsiveness to the effects of climate change (Diffenbaugh et al. 2008, p. 3). Even if precipitation and groundwater recharge remain at current levels, increased groundwater pumping and resultant aquifer shortages due to increased temperatures are nearly certain (Loaiciga et al. 2000, p. 193; Mace and Wade 2008, pp. 662, 664–665; Taylor et al. 2012, p. 3). Effects of climate change, such as air temperature increases and an increase in drought frequency and intensity, are occurring throughout the ranges of the Rio Grande mussels (Kinniburgh et al. 2015, p. 88). These effects are expected to exacerbate several of the stressors discussed above, such as water quality, water temperature, and loss of flowing water (Wuebbles et al. 2013, p. 16). In our analysis of the future condition of the Rio Grande mussels, we considered climate change to be an exacerbating factor in the increase of fine sediments, changes in water quality, and loss of flowing water.

Summary

Our analysis of the past, current, and future influences on what the Rio Grande mussels need for long-term viability revealed that there are three influences that pose the largest risk to future viability of the species. These risks are primarily related to habitat changes: the accretion of fine sediments, the loss of flowing water, and impairment of water quality; all of these are anticipated to be exacerbated by climate change.

Synergistic interactions are possible between the effects of climate change, the effects of threats (loss of stream flow, impairment of water quality, and accretion of fine sediments), and the activities that can lead to these threats, such as water development. Increases in temperature and changes in precipitation are likely to affect water quality, stream flows, and sediment accumulation rates in the Rio Grande. These threats could then be exacerbated by increases in water demand in the Rio Grande basin. However, it is difficult to project specifically how climate change will affect stream conditions because changes in stream conditions will also be directly tied to the management and water-use decisions made by both the United States and Mexico in the Rio Grande basin. Uncertainty regarding these management decisions in response to climate change, combined with uncertainty of future temperature and precipitation trends, make projecting possible synergistic effects of climate change speculative. However, we project that such synergistic effects will exist and will exacerbate the identified threats to the Salina mucket and Mexican fawnsfoot. Host fish availability and movement of glochidia are not anticipated to be key limiting factors that influence the future viability of Salina mucket; however, host fish availability and movement may affect the future viability of Mexican fawnsfoot.

Current Conditions

Given each Rio Grande mussel species has only one extant population, we analyzed current condition by subdividing each current population into three stream segments (*i.e.,* upstream, middle, and downstream) to capture variations in habitat and species' conditions within a population. We defined these stream segments by known changes in mussel habitat availability, water quality and quantity, and mussel abundance across each entire population.

Salina Mucket

We subdivided the Salina mucket population, located upstream of Amistad Reservoir in the Rio Grande, into three segments based on population density and habitat conditions. We analyzed population and habitat factors for each segment based on the current information.

Upstream Segment

This segment occurs in the upstream-most portion of the Salina mucket's current range for approximately 61 rmi (98 rkm) in Brewster County, Texas. The segment begins just downstream of the La Linda Texas International Bridge and ends at the Brewster and Terrell County line. The topography of this segment is dominated by steep canyon walls, predominantly bedrock streambed, and limited depositional areas. Outflows from the Rio Conchos and spring discharges from the Edwards-Trinity Plateau Aquifer heavily influence riverine flow in this segment (Randklev et al. 2018, p. 734). Multiple springs throughout this segment contribute to base flow and incrementally increase water quality downstream (Bennett et al. 2009, entire; Urbanczyk and Bennett 2017, p. 9). Species occurrence data in this segment, compiled from multiple sources, indicate that Salina mucket occur at an average abundance of 0.6 mussels per search hour (catch-per-unit-effort, CPUE). That is, one live Salina mucket is collected for roughly every 2 hours of search effort. The most recent comprehensive survey of this segment was conducted in 2015 and found 25 live Salina mucket from 11 of 24 sites sampled (Randklev et al. 2017, p. 163).

Middle Segment

This segment represents the approximate middle of the currently known population of the Salina mucket. The segment begins at the Brewster and Terrell County line and continues downstream for 22 rmi (35 rkm) to near Dryden, Texas (locally referred to as Johns Marina, a popular boat ramp). Riverine flows in this segment are typically higher velocity than upstream, and water quality appears to improve given the combined effects of spring inputs, Rio Conchos flows, and intermittent flows from San Francisco and Sanderson creeks. The river channel has greater access to the floodplain in this segment, resulting in hydrological changes including more depositional areas and bank habitats available for the Salina mucket (Miller 2020, pers. comm.). Salina mucket are more abundant, although still considered rare, in this segment. Sampling conducted in 2015 found 66 live Salina mucket from 11 of 14 sites sampled (Randklev et al. 2017, p. 163). Between 2003 and 2008, 19 live Salina mucket were found at one site near Dryden, Texas, during basin-wide surveys (Karatayev et al. 2012, p. 210). Shell material was also reported at an additional 7 sites (n = 159 shells; Karatayev et al. 2012, p. 211). Overall, within this segment, the Salina mucket has an average CPUE of 1.35 live mussels per hour.

Downstream Segment

The downstream segment begins at approximately Dryden, Texas, and extends downstream for 50 rmi (80 rkm) to Langtry, Texas, in Terrell and Val Verde Counties. Stream habitat and water quality are similar to that observed in the middle segment. However, the abundance of Salina mucket appears lower in this segment with an average CPUE of 0.6 live mussels per hour. Surveys conducted between 2013 and 2015 collected nine live Salina mucket found from three sites in this segment (Dascher et al. 2018, p. 318; Burlakova and Karatayev, 2013, unpaginated; Randklev et al. 2017, pp. 163–165; Randklev et al. 2020c, entire). Presumably, this reduced occupancy is due to a combination of effects, including inundation from Amistad Reservoir, irrigation, decreased flows due to a reduced number of spring inputs, and effects of evapotranspiration. Additional studies in this segment of the population are needed to better elucidate the species' occupancy (Karatayev et al. 2012, p. 214).

Resiliency

The available information indicates that the Salina mucket is currently restricted to approximately 16 percent of its historical range in the United States and Mexico in the Lower Canyons of the Rio Grande, Texas. The species has been extirpated from a large portion of the Rio Grande, as well as the Pecos River (Texas) and the Rio Salado (Mexico). The single extant population of Salina mucket occurs in areas of relatively little development but of marginal habitat and water quality. As described above, the species' abundance varies throughout the population with the majority of live individuals located in the middle segment. This population shows some evidence of recent recruitment in the form of multiple age classes of individuals (Randklev et al. 2017, p. 156). However, given the degraded habitat quality and low numbers, this may not be sustainable over the long term. We consider this population to have low overall resiliency due to the low species abundance, limited evidence of recruitment, and degraded habitat, which limit the species' ability to recover following stochastic events.

Representation

The Salina mucket only occupies one known population. We do not expect any significant differences in localized adaptations within this population, as the entire population occurs in similar habitat and faces similar stressors. As such, we consider this species to have representation consisting of a single population, limiting the species' ability to adapt to changes over time. Any representation that historically occurred throughout the Rio Grande or in Mexico has been lost.

Redundancy

Within the Rio Grande basin, the Salina mucket does not have multiple sufficiently resilient populations. Only one extant population is known to occur in the Lower Canyons area between Big Bend National Park and Amistad Reservoir. No other extant populations are known to exist. Therefore, this species has little to no redundancy and is unlikely to recover from catastrophic events that could eliminate the one extant population.

Mexican Fawnsfoot

We subdivided the Mexican fawnsfoot population, located between Eagle Pass and San Ygnacio, Texas, into three segments based on population density and habitat conditions. We analyzed population and habitat factors for each segment based on the current information.

Upstream Segment

This segment begins about 6 miles upstream of Eagle Pass, Texas, and continues downstream for approximately 106 rmi (171 rkm) through Maverick and Webb Counties, Texas, to 3 miles upstream of the Laredo Columbia Solidarity International Bridge. The flows in this stretch of the Rio Grande are heavily influenced by releases from Amistad Reservoir (Schmandt et al. 2013, p. 82). This segment has significant diversions including the Maverick Canals, multiple low water weirs, and pumping for irrigation purposes. The habitat within the segment is largely degraded with a very low abundance of Mexican fawnsfoot. Only three live Mexican fawnsfoot were collected from 2 of 20 sites in Maverick County surveyed in 2015 (Randklev et al. 2017, p. 224). This represents the most recent live records

of the species within that segment from the last 30 years. The average CPUE for Mexican fawnsfoot in this segment is very low, at 0.35 live mussels per hour.

Middle Segment

The middle segment begins about 3 miles upstream of the Laredo Colombia Solidarity International Bridge and continues downstream through Webb County, Texas, for 33 rmi (53 rkm) to the Interstate-35 Juarez-Lincoln International Bridge in Laredo, Texas. Stream habitat improves marginally in this segment and is less influenced by flows from Amistad Reservoir. The average CPUE of Mexican fawnsfoot is highest in this segment at about 1.48 live mussels per hour. Several studies have documented the presence of Mexican fawnsfoot in this segment. Surveys conducted in 2014 and 2015 documented 160 live individuals from 13 sites (Randklev et al. 2017, pp. 227–232). During surveys in 2013 and 2014, a total of 69 live individuals and 241 recently dead specimens from seven sites were collected (Brewster 2015, pp. 16–18). At a single site (near Pico Road, approximately the center of this segment), the surveyors discovered 35 live and 206 very recently dead individuals and noted that extremely low flows due to a major drought in July 2013 likely resulted in the elimination of the largest known Mexican fawnsfoot population (Brewster 2015, p. 30). Surveys between 2001 and 2011 collected 19 live individuals (Karatayev et al. 2012, p. 213).

Downstream Segment

The downstream-most segment begins just upstream of the Juarez-Lincoln International Bridge in Laredo, Texas, and continues through Webb and Zapata Counties, Texas, for 45 rmi (72 rkm) downstream to San Ygnacio, Texas, where impoundment effects of Falcon Lake begin. Historically, this segment most likely extended downstream farther into Zapata County and possibly Starr County; however, the completion and inundation of Falcon Lake in 1954 presumably extirpated any Mexican fawnsfoot occupying habitats underneath the current reservoir. Effluents from four wastewater treatment plants on the U.S. bank of the river and several on the Mexican bank of the river heavily influence this segment. The Texas Commission on Environmental Quality (TCEQ) has documented concentrations of fecal coliform and bacteria that exceed the established limits within this segment of the Rio Grande (TCEQ 2002a, p. 1; TCEQ 2002b, p. 1). Historical collection data indicate a spike in bacteria concentration just upstream of the Juarez-Lincoln International Bridge, at the beginning of this population segment (USIBWC 2012, pp. 6–7, 9–10). It is likely that degraded water quality from point and non-point sources, coupled with hydrological alterations from urban runoff, diversions, and low-water weirs, has contributed to the decline of Mexican fawnsfoot in this segment. Currently, the average CPUE in this segment is very low at 0.37 live mussels per hour. During surveys in 2014 and 2015, 23 live Mexican fawnsfoot were found from 10 sites within this segment (Randklev et al. 2017, p. 229). A very small population of Mexican fawnsfoot has also been documented downstream of the confluence of Delores Creek near the Webb and Zapata County line (Miller 2020, pers. comm.). This population's persistence is likely attributed to cleaner inflows from Delores Creek, which improve water quantity and quality for a short distance in the mainstem of the Rio Grande.

Resiliency

The available information indicates that the Mexican fawnsfoot is currently restricted to approximately 48 percent of its historical range in the United States and Mexico and is comprised of only one extant population in the Lower Rio Grande near Laredo, Texas. The species has been extirpated from a large portion of the Rio Grande near Amistad Reservoir (Texas) and presumably the Rio Salado (Mexico). The single extant population of Mexican fawnsfoot occurs in areas of significant development and hydrological alteration. The entire population has very limited abundance and only limited evidence of recruitment. As described above, the species' abundance varies throughout the population with the majority of the remaining live individuals located in the small, middle segment. This population shows some evidence of recent recruitment in the presence of multiple age classes of individuals, but these individuals are only found in the middle segment. However, given predicted human growth in this portion of the basin, this population will likely see increased threats. This population is considered to have low resiliency due to the very low species abundance, limited evidence of recruitment, and degraded habitat, which limit the species' ability to recover following stochastic events.

Representation

The Mexican fawnsfoot occupies one known population. We do not expect any significant differences in localized adaptations within this population, as the entire population occurs in similar habitat and faces similar stressors. As such, we consider this species to have representation consisting of a single population, limiting the species' ability to adapt to changes over time. Any representation that historically occurred throughout the Rio Grande or in Mexico has been lost.

Redundancy

Within the Rio Grande basin, the Mexican fawnsfoot has no redundant populations. Only one extant population is known to occur in the Rio Grande area between Amistad Reservoir and Laredo, Texas. No other known extant populations exist. Therefore, this species has little to no redundancy and is unlikely to recover from catastrophic events that could eliminate the one extant population.

Summary of Current Conditions

Salina Mucket

The one remaining population of the Salina mucket has low resiliency due to degraded habitat quality, low abundance, and limited evidence of recruitment. These factors will limit the species' ability to recover following stochastic events. This species remains in only one contiguous population; therefore, we do not expect significant differences in localized adaptations that would provide adequate representation to adapt to changing conditions. Additionally, with only one remaining population, the Salina mucket has little to no redundancy to protect the species from extinction following catastrophic events. Therefore, we have determined that the Salina mucket has low resiliency, low representation, and no redundancy.

Mexican Fawnsfoot

The one remaining population of the Mexican fawnsfoot has low resiliency due to very low species abundance, limited evidence of recruitment, and degraded habitat, which limit the species' ability to recover following stochastic events. This species remains in only one contiguous population; therefore, we do not expect significant differences in localized adaptations that would provide adequate representation to adapt to changing conditions. Additionally, with only one remaining population, the Mexican fawnsfoot has little to no redundancy to protect the species from extinction following catastrophic events. Therefore, we have determined that the Mexican fawnsfoot has low resiliency, low representation, and no redundancy.

As part of the SSA, we also considered a range of plausible future scenarios to capture the range of uncertainties regarding future threats and the projected responses by the Salina mucket and Mexican fawnsfoot. Because we determined that the current conditions of the species are both consistent with an endangered species (see *Determination of Status for the Salina Mucket and Mexican Fawnsfoot,* below), we are not presenting the results of the future scenarios in this proposed rule. Please refer to the SSA report (Service 2023) for the full analysis of future scenarios.

We note that, by using the SSA framework to guide our analysis of the scientific information documented in the SSA report, we have not only analyzed individual effects on the species, but we have also analyzed their potential cumulative effects. We incorporate the cumulative effects into our SSA analysis when we characterize the current and future condition of the species. To assess the current and future condition of the species, we undertake an iterative analysis that encompasses and incorporates the threats individually and then accumulates and evaluates the effects of all the 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.

Conservation Efforts and Regulatory Mechanisms

Because we are considering the best available information and because the discussion above primarily addresses the viability of the Rio Grande mussels in relation to the threats and factors affecting their viability, here we will discuss regulatory mechanisms and conservation actions that potentially have influenced or will influence the current and future viability of the Rio Grande mussels.

In Texas, the National Park Service manages lands and waterways under their purview in the Rio Grande Watershed for native plant and wildlife communities, including the Salina mucket. The large amount of land in conservation management in Big Bend National Park and the Rio Grande National Scenic River reduces risks to the Salina mucket from sediment inputs, habitat alterations, and contaminants.

In other Texas reaches of the Rio Grande, we are not aware of any management actions for the Salina mucket or Mexican fawnsfoot.

Determination of Status for the Salina Mucket and Mexican Fawnsfoot

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 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.

Status Throughout All of the Range

After evaluating threats to the two Rio Grande mussel species and assessing the cumulative effect of the threats under the Act's section 4(a)(1) factors, we find that both species of Rio Grande mussels have declined significantly in overall distribution and abundance throughout their ranges. Each species currently occurs in a single extant population, and the existing available habitats are reduced in quality and quantity, relative to historical conditions. Our analysis revealed five primary threats that caused these declines and pose a meaningful risk to the viability of the species. These threats are primarily related to habitat changes (Factor A from the Act): increased fine sediments, water quality impairment, and the loss of flowing water, all of which are exacerbated by the effects of climate change (Factor E). Additionally, barriers to fish movement (Factor E) limit dispersal and prevent recolonization of Mexican fawnsfoot after stochastic events.

Climate change has already begun to affect the Rio Grande basin of Texas and Mexico where theses mussels occur, resulting in higher air temperatures, increased evaporation, increased groundwater pumping, and changing precipitation patterns such that water levels have already reached historic lows rangewide (Dean and Schmidt 2011, p. 336; Sandoval-Solis et al. 2022, entire). These increasingly common and extended low-flow conditions put both species at elevated risk of habitat loss from increased fine sediments, poor water quality, loss of flowing water, and, specific to the Mexican fawnsfoot, increased risk of predation. Additionally, a low-water weir proposed for construction in the Lower Rio Grande in the upstream vicinity of Laredo, Texas, would eliminate the densest population segment of Mexican fawnsfoot, and about 7 percent of currently occupied habitat.

These risks, individual or compounded, could result in the significant reduction or extirpation of the existing Rio Grande mussel populations, further reducing the overall resiliency and representation of the species or driving them to extinction. Historically, both species, with a larger range of interconnected populations, would have been sufficiently resilient to stochastic and catastrophic events such as sedimentation and drought because lost population segments could be recolonized over time by dispersal from nearby surviving populations. This connectivity made both Rio Grande mussels highly resilient overall. However, under current conditions, restoring that connectivity on a large scale is not feasible due to Amistad Reservoir, unsuitably low flows, and lack of redundant populations.

Salina Mucket

Salina mucket has been extirpated from a large portion of the Rio Grande, as well as the Pecos River and the Rio Salado, and currently occupies only 16 percent of its historical range in the United States and Mexico. The last remaining population has low resiliency due to low species abundance, limited evidence of recruitment, and degraded habitat, which limit the species' ability to recover following stochastic events. Representation within the remaining Salina mucket population is extremely limited, impeding the species' ability to adapt to changes over time. With only one remaining population, a single catastrophic event has the potential to result in the extinction of the species. Additionally, this species is isolated from a large portion of its historical range due to the construction of reservoirs and unsuitable water quality, and, therefore, it is no longer able to recolonize other areas.

Because the Salina mucket occurs in only one location, has low abundance and limited recruitment, and has no

ability to disperse into new areas, the species is extremely vulnerable to extinction. Our analysis of the species' current condition (which includes the threats of declining water quantity and impaired water quality inflows from the Rio Conchos and alterations to instream habitat caused by increased sedimentation), as well as the conservation efforts discussed above, shows that the Salina mucket is in danger of extinction throughout all of its range due to the severity and immediacy of threats currently impacting the species. We find that a threatened species status is not appropriate for the Salina mucket because the threats that the species is experiencing are already occurring across the species' extremely contracted range. Therefore, the species is currently in danger of extinction throughout its range.

Mexican Fawnsfoot

Mexican fawnsfoot has been extirpated from a large portion of the Rio Grande near Amistad Reservoir and likely the Rio Salado, and currently occupies approximately 48 percent of its historical range in the United States and Mexico. The remaining population is considered to have low resiliency due to very low species abundance, limited evidence of recruitment, and degraded habitat, which limit the species' ability to recover following stochastic events. Representation within the remaining Mexican fawnsfoot population is extremely limited, impeding the species' ability to adapt to changes over time. With only one remaining population, a single catastrophic event has the potential to result in the extinction of the species. Additionally, this species is isolated from a large portion of its historical range due to the construction of reservoirs and unsuitable water quality, and, therefore, it is no longer able to recolonize other areas.

Because the Mexican fawnsfoot occurs in only one location, has low abundance and limited recruitment, and has no ability to disperse into new areas, the species is extremely vulnerable to extinction. Our analysis of the species' current condition (which includes the threats of declining water quantity, impaired water quality, and the potential alteration of instream habitats by the construction of a weir in Laredo), as well as the conservation efforts discussed above, shows that the Mexican fawnsfoot is in danger of extinction throughout all of its range due to the severity and immediacy of threats currently impacting the species. We find that a threatened species status is not appropriate for the Mexican fawnsfoot because the threats that the species is experiencing are already occurring across the species' extremely contracted range. Therefore, the species is currently in danger of extinction throughout its range.

Status Throughout a Significant Portion of the 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 in the foreseeable future throughout all or a significant portion of its range. We have determined that the Salina mucket and Mexican fawsnfoot are in danger of extinction throughout all of their ranges and accordingly did not undertake an analysis of any significant portion of the range for either species. Because the Salina mucket and Mexican fawnsfoot warrant listing as endangered throughout all of their ranges, our determination does not conflict with the decision in *Center for Biological Diversity* v. *Everson,* 435 F. Supp. 3d 69 (D.D.C. 2020) (*Everson*), which 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'' (79 FR 37578; July 1, 2014) providing that if the Services determine that a species is threatened throughout all of its range, the Services will not analyze whether the species is endangered in a significant portion of its range.

Salina Mucket and Mexican Fawnsfoot—Determination of Status

Our review of the best available scientific and commercial information indicates that the Salina mucket and Mexican fawnsfoot meet the Act's definition of endangered species. Therefore, we propose to list the Salina mucket and Mexican fawnsfoot as endangered species in accordance with sections 3(6) 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 Austin 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.

If these species are listed, 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 State of Texas would be eligible for Federal funds to implement management actions that promote the protection or recovery of the Salina mucket and Mexican fawnsfoot. Information on our grant programs that are available to aid species recovery can be found at: *https://www.fws.gov/service/financial-assistance.*

Although the Salina Mucket and Mexican fawnsfoot are only proposed for listing under the Act at this time, please let us know if you are interested in participating in recovery efforts for these species. Additionally, we invite you to submit any new information on these species whenever it becomes available and any information you may have for recovery planning purposes (see **FOR FURTHER INFORMATION CONTACT**, above).

Section 7 of the Act is titled Interagency Cooperation and mandates all Federal action 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.

In contrast, section 7(a)(4) of the Act requires Federal agencies to confer with the Service on any action which *is likely* to jeopardize the continued existence of any species proposed to be listed under the Act or result in the destruction or adverse modification of critical habitat proposed to be designated for such species. Although the conference procedures are required only when an action is likely to result in jeopardy or adverse modification, action agencies may voluntarily confer with the Service on actions that may affect species proposed for listing or critical habitat proposed to be designated. In the event that the subject species is listed or the relevant critical habitat is designated, a conference opinion may be adopted as a biological opinion and serve as compliance with section 7(a)(2).

Examples of discretionary actions for the Rio Grande mussels that may be subject to conference and consultation procedures under section 7 are land management or other landscape-altering activities on Federal lands administered by the National Park Service or the International Boundary and Water Commission 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 local Service Field Office (see **FOR FURTHER INFORMATION CONTACT**, above) with any specific questions on section 7 consultation and conference requirements.

The Act and its implementing regulations set forth a series of general prohibitions and exceptions that apply to endangered wildlife. The prohibitions of section 9(a)(1) of the Act, 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: (1) import endangered wildlife to, or export from, the United States; (2) take (which includes harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect) endangered wildlife within 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 in the course of commercial activity; or (5) sell or offer for sale in interstate or foreign commerce. Certain exceptions to these prohibitions apply to employees or agents of the Service, the National Marine Fisheries Service, other Federal land management agencies, and State conservation agencies.

We may issue permits to carry out otherwise prohibited activities involving endangered wildlife under certain circumstances. Regulations governing permits are codified at 50 CFR 17.22. With regard to endangered wildlife, a permit may be issued: for scientific purposes, for enhancing the propagation or survival of the species, or for take incidental to otherwise lawful activities. The statute also contains certain exemptions from the prohibitions, which are found in sections 9 and 10 of the Act.

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 proposed listing on proposed and ongoing activities within the range of the species proposed for listing.

As discussed above, certain activities that are prohibited under section 9 may be permitted under section 10 of the Act. In addition, to the extent currently known, the following activities will not be considered likely to result in violation of section 9 of the Act:

(1) Normal agricultural and silvicultural practices, including herbicide and pesticide use, that are carried out in accordance with any existing regulations, permit and label requirements, and best management practices; and

(2) Normal residential landscaping activities.

This list is intended to be illustrative and not exhaustive; additional activities that will not be considered likely to

result in violation of section 9 of the Act may be identified during coordination with the local field office, and in some instances (*e.g.,* with new information), the Service may conclude that one or more activities identified here will be considered likely to result in violation of section 9.

To the extent currently known, the following is a list of examples of activities that will be considered likely to result in violation of section 9 of the Act in addition to what is already clear from the descriptions of the prohibitions found at 50 CFR 17.21:

(1) Unauthorized handling or collecting of the species;

(2) Modification of the channel or water flow of any stream in which the Rio Grande mussels are known to occur;

(3) Livestock grazing that results in direct or indirect destruction of stream habitat; and

(4) Discharge of chemicals or fill material into any waters in which the Rio Grande mussels are known to occur.

This list is intended to be illustrative and not exhaustive; additional activities that will be considered likely to result in violation of section 9 of the Act may be identified during coordination with the local field office, and in some instances (*e.g.,* with new or site-specific information), the Service may conclude that one or more activities identified here will not be considered likely to result in violation of section 9. Questions regarding whether specific activities would constitute violation of section 9 of the Act should be directed to the Austin Ecological Services Field Office (see **FOR FURTHER INFORMATION CONTACT**, above).

II. Critical Habitat

Background

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 and the use of 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 resources 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 Federal agencies 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 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 a listed species or 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 agency would have already been required to consult with the Service even absent the 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 section 9 of the Act. 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 the 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 those planning efforts calls for a different outcome.

Physical or Biological Features Essential to the Conservation of the Species

In accordance with section 3(5)(A)(i) of the Act and regulations at 50 CFR 424.12(b), in determining which areas we will designate as critical habitat from within the geographical area occupied by the species at the time of listing, we consider the physical or biological features that are essential to the conservation of the species and which may require special management considerations or protection. The regulations at 50 CFR 424.02 define ''physical or biological features essential to the conservation of the species'' as the features that occur in specific areas and that are essential to support the life-history needs of the species, including, but not limited to, water characteristics, soil type, geological features, sites, prey, vegetation, symbiotic species, or other features. A feature may be a single habitat characteristic or a more complex combination of habitat characteristics. Features may include habitat characteristics that support ephemeral or dynamic habitat conditions. Features may also be expressed in terms relating to principles of conservation biology, such as patch size, distribution distances, and connectivity. For example, physical features essential to the conservation of the species might include gravel of a particular size required for spawning, alkaline soil for seed germination, protective cover for migration, or susceptibility to flooding or fire that maintains necessary early-successional habitat characteristics. Biological features might include prey species, forage grasses, specific kinds or ages of trees for roosting or nesting, symbiotic fungi, or absence of a particular level of nonnative species consistent with conservation needs of the listed species. The features may also be combinations of habitat characteristics and may encompass the relationship between characteristics or the necessary amount of a characteristic essential to support the life history of the species.

In considering whether features are essential to the conservation of the species, we may consider an appropriate quality, quantity, and spatial and temporal arrangement of habitat characteristics in the context of the life-history needs, condition, and status of the species. These characteristics include, but are not limited to, space for individual and population growth and for normal behavior; food, water, air, light, minerals, or other nutritional or physiological requirements; cover or shelter; sites for breeding, reproduction, or rearing (or development) of offspring; and habitats that are protected from disturbance.

We derive the specific physical or biological features essential to the conservation of the Salina mucket and Mexican fawnsfoot from studies of the species' habitat, ecology, and life history as described below. Additional information can be found in the SSA report (Service 2023, entire; available on *https://www.regulations.gov* under Docket No. FWS–R2–ES–2023–0026).

The primary physical and biological features that influence the resiliency of the Salina mucket and Mexican fawnsfoot include water quantity, availability of instream habitats, availability of and access to host fish, and adequate water quality. These features are described in further detail below, as well as above under Summary of Biological Status and Threats. Full descriptions of these habitat features are available in the SSA report (Service 2023, entire; available on *https://www.regulations.gov* under Docket No. FWS–R2–ES–2023–0026).

Water Quantity

All life stages of the Salina mucket and Mexican fawnsfoot need flowing water for survival. They are not found in lakes, reservoirs, or pools without flow, or in areas that are regularly dewatered (Randklev et al., 2020a, entire). River reaches with continuous flow support all life stages of the Salina mucket and Mexican fawnsfoot, while those with little or no flow do not. Flow rates needed by the species will vary depending on the location, the size of the river at that location, and substrate type, but they must be adequate to provide inflows of algae, bacteria, and detritus for food and removal of waste (Yeager et al. 1994, pp. 220–221; Nichols and Garling 2000, p. 881).

Instream Habitats

Salina Mucket

Salina mucket have specific habitat type and substrate needs. For juveniles, these include flow refugia, such as nearshore habitats, crevices, undercut riverbanks, travertine shelves, and large boulders (Randklev et al. 2017, p. 157). Adult Salina mucket also require stable areas of small-grained sediment, such as clay, silt, or sand, which provides suitable substrate for anchoring (Randklev et al. 2017, p. 157).

Mexican Fawnsfoot

Mexican fawnsfoot have specific habitat type and substrate needs. For juveniles, these include flow refugia such as riffle and run habitats, adjacent depositional areas, and banks (Karatayev et al. 2012, p. 211). Adult Mexican fawnsfoot also require stable areas of small-grained sediment, such as clay, silt, or sand, which provides suitable substrate for anchoring, as well as soft, unconsolidated sediments in protected nearshore areas adjacent to riffles and backwater habitats (Randklev et al. 2017, pp. 221, 223, 234).

Host Fish

As discussed earlier in this document, freshwater mussel larvae are parasites that must attach to a host fish to develop into juvenile mussels (Haag 2012, pp. 148, 178). The Salina mucket and Mexican fawnsfoot are believed to use the freshwater drum as a host fish (Bosman et al. 2015, entire; Sietman et al. 2018, pp. 1–2). The presence of this fish species, either singly or in combination with other yet-to-be-identified host fish species, supports the life-history needs of the Salina mucket and Mexican fawnsfoot.

Water Quality

Freshwater mussels, as a group, are sensitive to changes in water-quality parameters such as dissolved oxygen, salinity, ammonia, and pollutants. Habitats with appropriate levels of these parameters are considered suitable, while those habitats with levels outside of the appropriate ranges are considered less suitable. We have used information for the Salina mucket and Mexican fawnsfoot, where available, and data from other species when species-specific information is not available. Juvenile Salina mucket and Mexican fawnsfoot are expected to require low salinity (approximately 1.0 parts per thousand (ppt)) and low ammonia (approximately 0.7 milligrams per liter (mg/L)). Juvenile Salina mucket and Mexican fawnsfoot, like other juvenile freshwater mussels, are expected to be particularly susceptible to low dissolved oxygen levels. Juvenile mussels will reduce feeding behavior when dissolved oxygen is between 2–4 mg/L, and mortality has been shown to occur at dissolved oxygen levels below 1.3 mg/L for juveniles and below 3 mg/L for adults. Juvenile mussels are also highly susceptible to heavy metal pollution and require low levels of copper and other contaminants in the substrates they occupy (Yeager et al. 1994, pp. 220–221).

Finally, water temperature plays a critical role in the life history of freshwater mussels. High water temperatures can cause changes in clearance rates, valve closure, reduced reproductive output, and death (Chen et al. 2001, p. 214; Spooner and Vaughn 2008, pp. 308, 315). Laboratory studies investigating the effects of thermal stress on glochidia and adults of other Texas freshwater mussel species have indicated thermal stress may occur around 29 °C (84.2 °F) (Bonner et al. 2018, p. 56; Khan et al. 2019, entire). As thermal studies have not been completed for the Salina mucket or Mexican fawnsfoot, we have used these data to indicate likely thermal stress limits for the Salina mucket.

Summary of Essential Physical or Biological Features

Salina Mucket

We have determined that the physical or biological features essential to the conservation of the Salina mucket consist of a riverine system with habitat to support all life stages of the species, which includes:

(a) Flowing water at rates high enough to support clean-swept substrate but not so high as to dislodge individuals;

(b) Crevices beneath boulders, beneath shelves, and within undercut banks with seams of fine sediment;

(c) The presence of freshwater drum (*Aplodinotus grunniens*) or other identified host fish; and

(d) Water quality parameters within the following ranges:

1. Salinity below approximately 1.0 ppt;

2. Ammonia below 0.7 mg/L;

3. Low levels of contaminants; and

4. Dissolved oxygen levels within substrate greater than 1.3 mg/L.

Mexican Fawnsfoot

We have determined that the physical or biological features essential to the conservation of the Mexican fawnsfoot consist of a riverine system with habitat to support all life stages of the species, which includes:

(a) Flowing water at rates high enough to support clean-swept substrate but not so high as to dislodge individuals;

(b) Stable areas of small-grained sediment, such as clay, silt, or sand;

(c) Flow refugia such as riffle and run habitats, adjacent depositional areas, and banks;

(d) The presence of freshwater drum (*Aplodinotus grunniens*) or other identified host fish; and

(e) Water quality parameters within the following ranges:

1. Salinity below approximately 1.0 ppt;

2. Ammonia below 0.7 mg/L;

3. Low levels of contaminants; and

4. Dissolved oxygen levels within substrate greater than 1.3 mg/L.

Special Management Considerations or Protection

When designating critical habitat, we assess whether the specific areas within the geographical area occupied by the species at the time of listing contain features which are essential to the conservation of the species and which may require special management considerations or protection. The features essential to the conservation of these species may require special management considerations or protection to reduce the following threats: Increased fine sediment, water quality impairment, loss of flowing water, and barriers to fish movement. Management activities that could ameliorate these threats and protect the integrity of the stream ecosystem include restoring or maintaining the natural hydrology of the stream, restoring or maintaining bank and riffle habitats, and appropriately maintaining bridges and other stream crossings to limit sediment input.

Criteria Used To Identify Critical Habitat

As required by section 4(b)(2) of the Act, we use the best scientific data available to designate critical habitat. In accordance with the Act and our implementing regulations at 50 CFR 424.12(b), we review available information pertaining to the habitat requirements of the species and identify specific areas within the geographical area occupied by the species at the time of listing and any specific areas outside the geographical area occupied by the species to be considered for designation as critical habitat. For both the Salina mucket and Mexican fawnsfoot, we are proposing to designate critical habitat in areas within the geographical area occupied by the species at the time of listing. For the Salina mucket, we also are proposing to designate specific areas outside the geographical area occupied by the species because we have determined that a designation limited to occupied areas would be inadequate to ensure the conservation of the species given that it has only one extant population. We were able to identify an unoccupied area that qualifies as habitat because it contains the essential physical or biological features for the species, and we are reasonably certain that this area will contribute to the conservation of the Salina mucket because it contains suitable habitat, the riparian area is under Federal ownership and is managed by the National Park Service (NPS), and the subunit will provide a population expansion opportunity which will reduce the impact of site-level stochastic events on the sole remaining population. Although the current distributions of both Rio Grande mussels are much reduced from their historical distributions, we were unable to identify any unoccupied areas that are essential for the conservation of the Mexican fawnsfoot (*i.e.,* unoccupied areas that contain at least one essential physical or biological feature for the Mexican fawnsfoot and have a reasonable certainty of contributing to the conservation of the species), and we are, therefore, not proposing to designate any unoccupied areas as critical habitat for this species. We anticipate that recovery will require continued protection of the existing populations and habitat, as well as ensuring that additional habitats are available, wherever possible, for the species to expand their populations.

To determine and select appropriate areas that contain the physical or biological features essential to the conservation of the Salina mucket and

Mexican fawnsfoot, we developed a conservation strategy for these species. The goal of our conservation strategy is to recover the species to the point where the protections of the Act are no longer necessary. The role of critical habitat in achieving this conservation goal is to identify the specific areas within the species' range that provide essential physical or biological features, without which rangewide resiliency, redundancy, and representation could not be achieved. The current distributions of the Salina mucket and Mexican fawnsfoot are both reduced from their historical distributions to only one population each. We anticipate that recovery of these species will require not only continued protection of the last remaining extant populations and their habitats, but also reintroduction of populations in additional areas of the species' historical range. Reintroductions would ensure there are adequate numbers of mussels in stable populations and that these populations occur over a wide geographical area. This strategy will help to ensure that catastrophic events, such as drought, floods, or chemical spills, which can lead to the stranding, desiccation, or death of entire aggregations of mussels, cannot simultaneously affect all known populations.

Guided by our conservation strategy goals, we determined which occupied and unoccupied areas to include as critical habitat for the Salina mucket and Mexican fawnsfoot by the criteria described below.

Areas Occupied at the Time of Listing

To determine the general extent, location, and boundaries of critical habitat, we used Environmental Systems Research Institute, Inc. (Esri) ArcGIS mapping software for mapping and calculating areas along with spatial data layers, including historical and current records of Salina mucket's and Mexican fawnsfoot's occurrences, distribution, and habitat requirements found in publications, agency reports, and personal communications. We then identified stream segments occupied by the species through confirmed occupations from 2000 to present. We determined that areas occupied within this time frame are likely to still support the species given survey recency and frequency in these areas. Given these species are both restricted to only one population each, we determined that all areas deemed to be occupied at the time of listing should be proposed for critical habitat designation.

We delineated occupied critical habitat unit boundaries using the following criterion: First, we evaluated habitat suitability of stream segments within the geographical area occupied at the time of listing and delineated those segments that contain some or all of the physical and biological features to support life-history functions essential for conservation of these species. We then evaluated those occupied stream segments identified and refined the starting and ending points by evaluating the presence or absence of appropriate physical and biological features. We selected upstream and downstream cutoff points to omit areas that are highly degraded and are not likely to contain the physical or biological features to support the species. For example, permanently dewatered areas or areas in which there was a change to unsuitable parameters (*e.g.,* water quality, water quantity, inadequate substrate) were used to mark the start or endpoint of a stream segment proposed for designation. Occupied critical habitat stream segments were then mapped using ArcMap version 10 (Environmental Systems Research Institute, Inc.), a Geographic Information Systems (GIS) program.

We consider the following stream reach to be occupied by the Salina mucket at the time of proposed listing: Lower Canyons and Martin Canyon (see Proposed Critical Habitat Designation, below).

We consider the following stream reach to be occupied by the Mexican fawnsfoot at the time of proposed listing: Laredo Reach (see Proposed Critical Habitat Designation, below).

Areas Unoccupied at the Time of Listing

Salina Mucket

We have determined that a designation limited to the occupied areas would be inadequate to ensure the conservation of the Salina mucket. Therefore, we have also identified, and propose for designation as critical habitat, unoccupied areas that are essential for the conservation of the species. The Salina mucket is restricted to only one remaining population that has low resilience to stochastic events. This population has low abundance and reproduction, and it is affected by impairments to water quality and quantity. We consider this species functionally extirpated from the Rio Grande below Amistad Reservoir and from the Rio Salado in Mexico. Since there is only one remaining population of Salina mucket, the species has low representation and limited redundancy. Expanding the last remaining population farther upstream within the historical range of the species will increase viability of the Salina mucket and reduce the likelihood that a catastrophic event would result in the extinction of the species.

The Rio Grande between the Talley Campground in Big Bend National Park and La Linda, Mexico, contains stream segments that maintain sufficient habitat to support adult and juvenile Salina mucket, as well as their host fish. Specifically, this reach of the Rio Grande contains habitat patches that contain appropriate water quantity and substrates to be occupied by Salina mucket, and a confirmed host fish, freshwater drum, has been collected in this stream reach. However, this reach of the Rio Grande is not currently known to be occupied by the Salina mucket. The Boquillas Canyon subunit lacks the recent, thorough survey efforts from 2000 through present that have been completed elsewhere within the historical range of the Salina mucket, and there is inadequate information in hand to deem the stream segment as currently occupied by the Salina mucket. This does not preclude the possibility that the species may occupy this segment, but we do not currently have adequate survey data available to make that determination at this time. Regardless of the current occupation status of the unit, we believe this subunit has retained the necessary physical or biological features that will allow for the occupation and maintenance of a Salina mucket population This unit is essential for the conservation of the species as it provides the only habitats into which the species can naturally expand its only remaining population, as habitats downstream of the occupied critical habitat unit cannot be restored to maintain the physical and biological features necessary to support the species. The proposed unoccupied critical habitat designation includes stream reaches known to have been occupied by the species historically, but they are currently not known to be occupied by the species.

Mexican Fawnsfoot

We are not proposing to designate any areas outside the geographical area currently occupied by Mexican fawnsfoot because we could not identify any unoccupied areas that are essential for the conservation of the species. Although the Mexican fawnsfoot requires additional habitat for its recovery, we do not currently have information identifying additional unoccupied areas that could contain suitable habitat for adult and juvenile Mexican fawnsfoot and its host fish. Much of the historical range of the

Mexican fawnsfoot has been impacted by alterations to instream flows due to construction and operation of large impoundments, which have led to declines in habitat quality and the almost entire loss of freshwater mussel presence. Therefore, we do not have information at this time to allow us to determine which unoccupied areas may be essential for the conservation of the Mexican fawnsfoot.

Proposed Critical Habitat Designation

We propose to designate as critical habitat stream reaches that we have determined are occupied at the time of listing (*i.e.,* currently occupied) and that contain one or more of the physical or biological features that are essential to support life-history processes of the species. We have also identified, and propose for designation as critical habitat, unoccupied areas that are essential for the conservation of the Salina mucket.

The proposed critical habitat designation is defined by the map or maps, as modified by any accompanying regulatory text, presented at the end of this document under Proposed Regulation Promulgation. We include more detailed information on the boundaries of the critical habitat designation in the preamble of this document. We will make the coordinates or plot points or both on which each map is based available to the public on *https://www.regulations.gov* at Docket No. FWS–R2–ES–2023–0026.

When determining proposed critical habitat boundaries, we made every effort to avoid including developed areas such as lands covered by buildings, pavement, and other structures because such lands lack physical or biological features necessary for the species. The scale of the maps we prepared under the parameters for publication within the Code of Federal Regulations may not reflect the exclusion of such developed lands. Any such lands inadvertently left inside critical habitat boundaries shown on the maps of this proposed rule have been excluded by text in the proposed rule and are not proposed for designation as critical habitat. Therefore, if the critical habitat is finalized as proposed, a Federal action involving these lands would not trigger section 7 consultation with respect to critical habitat and the requirement of no adverse modification unless the specific action would affect the physical or biological features in the adjacent critical habitat.

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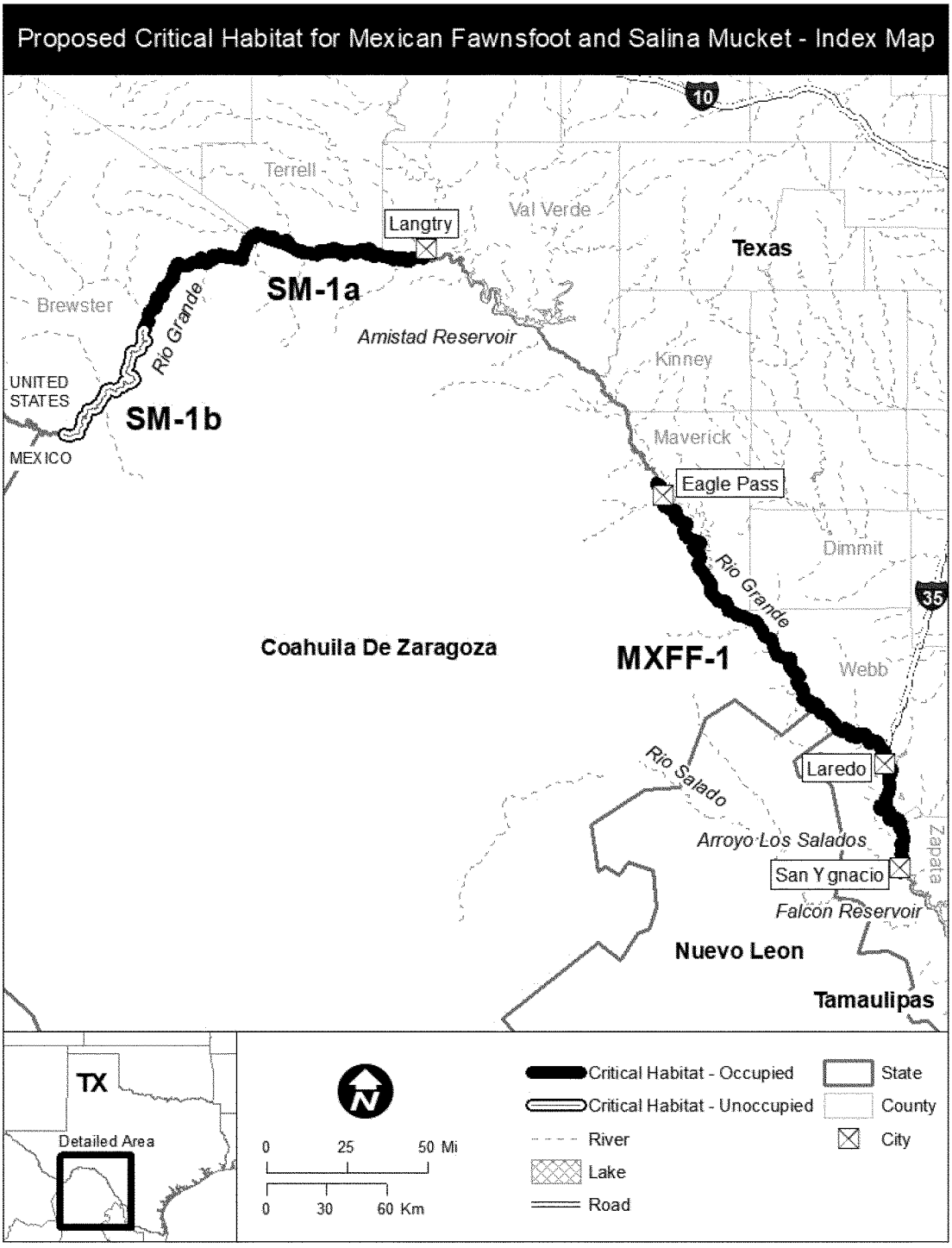

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We present an index map of the proposed critical habitat for both mussel species:

Salina Mucket

We are proposing a total of 199.6 river miles (rmi) (321.0 river kilometers (rkm)) in one unit, consisting of two subunits, as critical habitat for the Salina mucket. The critical habitat unit we describe below constitutes our current best assessment of areas that meet the definition of critical habitat for the Salina mucket. The area we propose as critical habitat for the Salina mucket is the Rio Grande unit (SM–1), along the Rio Grande from approximately 50 m downstream of the Talley Trail termination in Big Bend National Park to its confluence with Langtry Creek just upstream of Langtry, Texas. Table 1 presents information on the proposed critical habitat unit, its subunits, and their approximate river miles.

TABLE 1—PROPOSED CRITICAL HABITAT UNIT FOR THE SALINA MUCKET

[Area estimates reflect all land within critical habitat unit boundaries]

Critical habitat unit	Subunit name	Adjacent riparian land ownership by type	Size of unit in river miles (kilometers)	Occupied?
SM–1, Rio Grande	SM–1a, Lower Canyons and Martin Canyon.	Federal (60.5 rmi; 97.3 rkm) State (18.3 rmi; 29.5 rkm) Private/Other (58.0 rmi: 93.3 rkm)	136.8 (220.1)	Yes.
	SM–1b, Boquillas Canyon.	Federal (57.2 rmi; 92.0 rkm) State (5.6 rmi; 9.0 rkm)	62.8 (101.0)	No.
Total		Federal (117.7 rmi; 189.3 rkm) State (23.9 rmi; 38.4 rkm) Private/Other (58.0 rmi; 93.3 rkm)	199.6 (321.0)	

Note: River miles may not sum due to rounding.

We present a brief description of the unit, and reasons why it meets the definition of critical habitat for Salina mucket, below.

Unit SM–1: Rio Grande

Subunit SM–1a: Lower Canyons and Martin Canyon—This subunit consists of 136.8 rmi (220.1 rkm) of occupied habitat on the U.S. side of the Rio Grande in Terrell, Brewster, and Val Verde Counties, Texas. Most of this reach is part of the Rio Grande Wild and Scenic River, owned by the United States and managed by the National Park Service. A small portion of the subunit is owned by the State of Texas. It was designated a National Wild and Scenic River in 1978 (Garrett and Edwards 2004, p. 396), which affords some protection from Federal development projects but does not limit State, local, or private development (National Wild and Scenic Rivers System 2021, p. 1). Riverine flow in this segment is influenced by spring discharges from the Edwards-Trinity Plateau Aquifer, as well as outflows from the Rio Conchos and intermittent flows from San Francisco and Sanderson Creeks (Randklev et al. 2018, p. 734). Multiple springs throughout this segment contribute to base flow and incrementally increase water quality downstream (Bennett et al. 2009, entire; Urbanczyk and Bennett 2017, p. 9). Increases in agricultural development in Rio Conchos or increased groundwater demands in the Edwards-Trinity Plateau Aquifer could decrease baseflows in this subunit and lead to loss of adequate flow and degraded water quality. Each of the identified physical or biological features essential to the conservation of the Salina mucket, including adequate stream flows, presence of appropriate instream habitats, adequate water quality, and access to host fish, are present in this subunit. Special management considerations may be required to maintain instream flows and adequate water quality in the river and to maintain bank habitats that can be occupied by the species.

Subunit SM–1b: Boquillas Canyon—The Boquillas Canyon subunit consists of 62.8 rmi (101.0 rkm) of unoccupied habitat on the U.S. side of the Rio Grande in Brewster County, Texas. Most of this reach is part of Big Bend National Park and the Rio Grande Wild and Scenic River, both owned by the United States and managed by the National Park Service. Big Bend National Park was established in 1944, and the National Wild and Scenic River was designated in 1978 (Garrett and Edwards 2004, p. 396), which affords some protection from Federal development projects but does not limit State, local, or private development (National Wild and Scenic Rivers System 2021, p. 1).

This unit is habitat for the Salina mucket because it contains appropriate water quantity and substrates for the species, and we are reasonably certain that this subunit will contribute to the conservation of the Salina mucket because the unit contains appropriate habitat, the riparian area is under Federal ownership and is managed by the NPS, and the subunit will provide a population expansion opportunity which will reduce the impact of site-level stochastic events on the sole remaining population.

As with the Lower Canyons and Martin Canyon subunit, riverine flow in this segment is heavily influenced by outflows from the Rio Conchos and spring discharges from the Edwards-Trinity Plateau Aquifer (Randklev et al. 2018, p. 734). Multiple springs throughout this segment contribute to base flow and incrementally increase water quality downstream (Bennett et al. 2009, entire; Urbanczyk and Bennett 2017, p. 9). Persistent inflows from the Rio Conchos are likely critical to maintaining appropriate salinity levels for the Salina mucket (Urbanczyk and Bennett 2017, p. 16). Increases in agricultural development in the Rio Conchos or increased groundwater demands in the Edwards-Trinity Plateau Aquifer could decrease baseflows in this subunit and lead to loss of adequate flow and degraded water quality. Each of the identified physical or biological features essential to the conservation of the Salina mucket, including adequate stream flows, adequate water quality, presence of appropriate instream habitats, and access to host fish, are present in this subunit.

Mexican Fawnsfoot

We are proposing a total of 185.6 rmi (298.7 rkm) in one unit as critical habitat for the Mexican fawnsfoot. The critical habitat unit we describe below constitutes our current best assessment of areas that meet the definition of critical habitat for the Mexican fawnsfoot. The area we propose as critical habitat for Mexican fawnsfoot is the Laredo Reach unit (MXFF–1) along the Rio Grande from approximately Eagle Pass, Texas, to its confluence with the El Salado approximately 4.5 miles downstream of San Ygnacio, Texas. Table 2 shows the proposed critical habitat unit and the approximate river miles of the unit.

TABLE 2—PROPOSED CRITICAL HABITAT UNIT FOR MEXICAN FAWNSFOOT

[Area estimates reflect all land within critical habitat unit boundaries]

Critical habitat unit	Adjacent riparian land ownership by type	Size of unit in river miles (kilometers)	Occupied?
MXFF–1, Laredo Reach	State/Local (3.7 rmi; 6.0 rkm) Tribal (0.7 rmi; 1.1 rkm) Private (181.2 rmi; 291.6rkm)	185.6 (298.7)	Yes.
Total	State/Local (3.7 rmi; 6.0 rkm) Tribal (0.7 rmi; 1.1 rkm) Private (181.2 rmi; 291.6 rkm)	185.6 (298.7)	

Note: River miles may not sum due to rounding.

We present a brief description of the unit, and reasons why it meets the definition of critical habitat for Mexican fawnsfoot, below.

Unit MXFF–1: Laredo Reach

This unit consists of 185.6 rmi (298.7 rkm) of the U.S. side of the Rio Grande between Eagle Pass in Maverick County, Texas; through Webb County, Texas; and to San Ygnacio in Zapata County, Texas. This unit is in State, local, Tribal, and private ownership. This unit is occupied and contains the last known remaining population of the Mexican fawnsfoot. This unit is heavily influenced by development along the U.S.-Mexico border. Rapid human population growth as well as industrialization on the Mexican side of the river has stressed the existing wastewater treatment facilities, and Rio Grande water quality is impaired as a result (Texas Clean Rivers Program 2013, p. 7). Flows in this unit are regulated by released from Amistad Reservoir based on hydropower generation and water deliveries for downstream irrigation needs in Texas (Texas Water Development Board 2016, pp. 7–8). Each of the identified physical or biological features essential to the conservation of the Mexican fawnsfoot, including adequate stream flows, adequate water quality, presence of appropriate instream habitats, and access to host fish, are present in part or in whole in this unit. Special management considerations to improve water quality and maintain instream flows in the river may be required.

Effects of Critical Habitat Designation

Section 7 Consultation

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. In addition, section 7(a)(4) of the Act requires Federal agencies to confer with the Service on any agency action which is likely to jeopardize the continued existence of any species proposed to be listed under the Act or result in the destruction or adverse modification of proposed critical habitat.

We published a final rule revising the definition of destruction or adverse modification on August 27, 2019 (84 FR 44976). Destruction or adverse modification means a direct or indirect alteration that appreciably diminishes the value of critical habitat as a whole for the conservation of a listed species.

Compliance with the requirements of section 7(a)(2) is documented through our issuance of:

(1) A concurrence letter for Federal actions that may affect, but are not likely to adversely affect, listed species or critical habitat; or

(2) A biological opinion for Federal actions that may affect, and are likely to adversely affect, listed species or critical habitat.

When we issue a biological opinion concluding that a project is likely to jeopardize the continued existence of a listed species and/or destroy or adversely modify critical habitat, we provide reasonable and prudent alternatives to the project, if any are identifiable, that would avoid the likelihood of jeopardy and/or destruction or adverse modification of critical habitat. We define ''reasonable and prudent alternatives'' (at 50 CFR 402.02) as alternative actions identified during formal consultation that:

(1) Can be implemented in a manner consistent with the intended purpose of the action,

(2) Can be implemented consistent with the scope of the Federal agency's legal authority and jurisdiction,

(3) Are economically and technologically feasible, and

(4) Would, in the Service Director's opinion, avoid the likelihood of jeopardizing the continued existence of the listed species or avoid the likelihood of destroying or adversely modifying critical habitat.

Reasonable and prudent alternatives can vary from slight project modifications to extensive redesign or relocation of the project. Costs associated with implementing a reasonable and prudent alternative are similarly variable.

Regulations at 50 CFR 402.16 set forth requirements for Federal agencies to reinitiate consultation if any of the following four conditions occur: (1) the amount or extent of taking specified in the incidental take statement is exceeded; (2) new information reveals effects of the action that may affect listed species or critical habitat in a manner or to an extent not previously considered; (3) the identified action is subsequently modified in a manner that causes an effect to the listed species or critical habitat that was not considered in the biological opinion or written concurrence; or (4) a new species is listed or critical habitat designated that may be affected by the identified action. The reinitiation requirement applies only to actions that remain subject to some discretionary Federal involvement or control. As provided in 50 CFR 402.16, the requirement to reinitiate consultations for new species listings or critical habitat designation does not apply to certain agency actions (*e.g.,* land management plans issued by the Bureau of Land Management in certain circumstances).

Application of the ''Destruction or Adverse Modification'' Standard

The key factor related to the destruction or adverse modification determination is whether implementation of the proposed Federal action directly or indirectly alters the designated critical habitat in a way that appreciably diminishes the value of the critical habitat as a whole for the conservation of the listed species. As discussed above, the role of critical

habitat is to support the physical or biological features essential to the conservation of a listed species and provide for the conservation of the species.

Section 4(b)(8) of the Act requires us to briefly evaluate and describe, in any proposed or final regulation that designates critical habitat, activities involving a Federal action that may violate section 7(a)(2) of the Act by destroying or adversely modifying such habitat, or that may be affected by such designation.

Activities that we may, during a consultation under section 7(a)(2) of the Act, consider likely to destroy or adversely modify critical habitat include, but are not limited to:

(1) Actions that would alter the existing flow regime. Such activities could include, but are not limited to, impoundment, water diversion, and water withdrawal. These activities could eliminate or reduce the habitat necessary for the growth and reproduction of the Rio Grande mussels.

(2) Actions that would significantly alter water chemistry or temperature. Such activities could include, but are not limited to, release of chemicals, biological pollutants, or heated effluents into the surface water or connected groundwater at a point source or by dispersed release (non-point source). These activities could alter water conditions to levels that are beyond the tolerances of the Rio Grande mussels or their host fish and result in direct or cumulative adverse effects to these individuals and their life cycles.

(3) Actions that would significantly increase sediment deposition within the stream channel. Such activities could include, but are not limited to, excessive sedimentation from livestock grazing, road construction, channel alteration, and other watershed and floodplain disturbances. These activities could eliminate or reduce the habitat necessary for the growth and reproduction of the Rio Grande mussels and their host fish by increasing the sediment deposition to levels that would adversely affect their ability to complete their life cycles.

(4) Actions that would significantly alter instream habitats that could be occupied by the species. Such activities could include bank grading or other mechanical alterations of bank habitats, streambed grading, and gravel mining of instream riffle habitats.

Exemptions

Application of Section 4(a)(3) of the Act

Section 4(a)(3)(B)(i) of the Act (16 U.S.C. 1533(a)(3)(B)(i)) provides that the Secretary shall not designate as critical habitat any lands or other geographical areas owned or controlled by the Department of Defense (DoD), or designated for its use, that are subject to an integrated natural resources management plan (INRMP) prepared under section 101 of the Sikes Improvement Act of 1997 (16 U.S.C. 670a), if the Secretary determines in writing that such plan provides a benefit to the species for which critical habitat is proposed for designation. No DoD lands with a completed INRMP are within the proposed critical habitat designation.

Consideration of Impacts Under Section 4(b)(2) of the Act

Section 4(b)(2) of the Act states that the Secretary shall designate and make revisions to critical habitat on the basis of the best available scientific data after taking into consideration the economic impact, national security impact, and any other relevant impact of specifying any particular area as critical habitat. The Secretary may exclude an area from designated critical habitat based on economic impacts, impacts on national security, or any other relevant impacts. Exclusion decisions are governed by the regulations at 50 CFR 424.19 and the Policy Regarding Implementation of Section 4(b)(2) of the Endangered Species Act (hereafter, the ''2016 Policy''; 81 FR 7226, February 11, 2016), both of which were developed jointly with the National Marine Fisheries Service (NMFS). We also refer to a 2008 Department of the Interior Solicitor's opinion entitled, ''The Secretary's Authority to Exclude Areas from a Critical Habitat Designation under Section 4(b)(2) of the Endangered Species Act'' (M–37016).

In considering whether to exclude a particular area from the designation, we identify the benefits of including the area in the designation, identify the benefits of excluding the area from the designation, and evaluate whether the benefits of exclusion outweigh the benefits of inclusion. If the analysis indicates that the benefits of exclusion outweigh the benefits of inclusion, the Secretary may exercise discretion to exclude the area only if such exclusion would not result in the extinction of the species. In making the determination to exclude a particular area, the statute on its face, as well as the legislative history, are clear that the Secretary has broad discretion regarding which factor(s) to use and how much weight to give to any factor. In our final rules, we explain any decision to exclude areas, as well as decisions not to exclude, to make clear the rational basis for our decision. We describe below the process that we use for taking into consideration each category of impacts and any initial analyses of the relevant impacts.

Consideration of Economic Impacts

Section 4(b)(2) of the Act and its implementing regulations require that we consider the economic impact that may result from a designation of critical habitat. To assess the probable economic impacts of a designation, we must first evaluate specific land uses or activities and projects that may occur in the area of the critical habitat. We then must evaluate the impacts that a specific critical habitat designation may have on restricting or modifying specific land uses or activities for the benefit of the species and its habitat within the areas proposed. We then identify which conservation efforts may be the result of the species being listed under the Act versus those attributed solely to the designation of critical habitat for this particular species. The probable economic impact of a proposed critical habitat designation is analyzed by comparing scenarios both ''with critical habitat'' and ''without critical habitat.''

The ''without critical habitat'' scenario represents the baseline for the analysis, which includes the existing regulatory and socio-economic burden imposed on landowners, managers, or other resource users potentially affected by the designation of critical habitat (*e.g.,* under the Federal listing as well as other Federal, State, and local regulations). Therefore, the baseline represents the costs of all efforts attributable to the listing of the species under the Act (*i.e.,* conservation of the species and its habitat incurred regardless of whether critical habitat is designated). The ''with critical habitat'' scenario describes the incremental impacts associated specifically with the designation of critical habitat for the species. The incremental conservation efforts and associated impacts would not be expected without the designation of critical habitat for the species. In other words, the incremental costs are those attributable solely to the designation of critical habitat, above and beyond the baseline costs. These are the costs we use when evaluating the benefits of inclusion and exclusion of particular areas from the final designation of critical habitat should we choose to conduct a discretionary 4(b)(2) exclusion analysis.

Executive Orders (E.O.s) 12866 and 13563 direct Federal agencies to assess the costs and benefits of available regulatory alternatives in quantitative (to the extent feasible) and qualitative terms. Consistent with the E.O.

regulatory analysis requirements, our effects analysis under the Act may take into consideration impacts to both directly and indirectly affected entities, where practicable and reasonable. If sufficient data are available, we assess to the extent practicable the probable impacts to both directly and indirectly affected entities. Section 3(f) of E.O. 12866 identifies four criteria when a regulation is considered a ''significant regulatory action'' and requires additional analysis, review, and approval if met. The criterion relevant here is whether the designation of critical habitat may have an economic effect of $200 million or more in any given year (section 3(f)(1)). Therefore, our consideration of economic impacts uses a screening analysis to assess whether the critical habitat designations for the Salina mucket and Mexican fawnsfoot are likely to exceed the economically significant threshold.

For these particular designations, we developed an incremental effects memorandum (IEM) considering the probable incremental economic impacts that may result from the proposed designations of critical habitat. The information contained in our IEM was then used to develop a screening analysis of the probable effects of the critical habitat designations for the Salina mucket and Mexican fawnsfoot (IEc 2022, entire). We began by conducting a screening analysis of the proposed designations of critical habitat in order to focus our analysis on the key factors that are likely to result in incremental economic impacts. The purpose of the screening analysis is to filter out particular geographical areas of critical habitat that are already subject to such protections and are, therefore, unlikely to incur incremental economic impacts. In particular, the screening analysis considers baseline costs (*i.e.,* absent critical habitat designation) and includes any probable incremental economic impacts where land and water use may already be subject to conservation plans, land management plans, best management practices, or regulations that protect the habitat area as a result of the Federal listing status of the species. Ultimately, the screening analysis allows us to focus our analysis on evaluating the specific areas or sectors that may incur probable incremental economic impacts as a result of the designations. The presence of the listed species in occupied areas of critical habitat means that any destruction or adverse modification of those areas is also likely to jeopardize the continued existence of the species. Therefore, designating occupied areas as critical habitat typically causes little if any incremental impacts above and beyond the impacts of listing the species. As a result, we generally focus the screening analysis on areas of unoccupied critical habitat (unoccupied units or unoccupied areas within occupied units). Overall, the screening analysis assesses whether designation of critical habitat is likely to result in any additional management or conservation efforts that may incur incremental economic impacts. This screening analysis combined with the information contained in our IEM constitute what we consider to be our draft economic analysis (DEA) of the proposed critical habitat designations for the Salina mucket and Mexican fawnsfoot; our DEA is summarized in the narrative below.

As part of our screening analysis, we considered the types of economic activities that are likely to occur within the areas likely affected by the critical habitat designations. In our evaluation of the probable incremental economic impacts that may result from the proposed critical habitat designations for the Salina mucket and Mexican fawnsfoot, first we identified, in the IEM dated March 22, 2022, probable incremental economic impacts associated with the following categories of activities: (1) Federal (National Park Service) lands management; (2) roadway and bridge construction; (3) reservoir management; (4) instream dams and diversions; (5) instream projects or management; (6) border activities; (7) powerline or pipeline construction or maintenance; and (8) border protection. We considered each industry or category individually. Additionally, we considered whether the activities have any Federal involvement. Critical habitat designation generally will not affect activities that do not have any Federal involvement; under the Act, designation of critical habitat only affects activities conducted, funded, permitted, or authorized by Federal agencies. If we list the species, in areas where the Salina mucket and Mexican fawnsfoot are present, Federal agencies would be required to consult with the Service under section 7 of the Act on activities they authorize, fund, or carry out that may affect the species. If when we list the species, we also finalize these proposed critical habitat designations, Federal agencies would be required to consider the effects of their actions on the designated habitat, and if the Federal action may affect critical habitat, our consultations would include an evaluation of measures to avoid the destruction or adverse modification of critical habitat.

In our IEM, we attempted to clarify the distinction between the effects that would result from the species being listed and those attributable to the critical habitat designations (*i.e.,* difference between the jeopardy and adverse modification standards) for the Salina mucket and Mexican fawnsfoot. Because the critical habitat designations for the Salina mucket and Mexican fawnsfoot are being proposed concurrently with their listing, it has been our experience that it is more difficult to discern which conservation efforts are attributable to the species being listed and those which will result solely from the designation of critical habitat. However, the following specific circumstances in this case help to inform our evaluation: (1) The essential physical or biological features identified for each species' critical habitat are the same features essential for the life requisites of the species, and (2) any actions that would likely adversely affect the essential physical or biological features of occupied critical habitat are also likely to adversely affect the species itself. The IEM outlines our rationale concerning this limited distinction between baseline conservation efforts and incremental impacts of the critical habitat designations for these species. This evaluation of the incremental effects has been used as the basis to evaluate the probable incremental economic impacts of these proposed designations of critical habitat.

Salina Mucket

The proposed critical habitat designation for the Salina mucket totals approximately 199.6 rmi (321.0 rkm), of which approximately 69 percent is occupied by the species. In these areas, any actions that may affect the species or its habitat would also affect designated critical habitat, and it is unlikely that any additional conservation efforts would be recommended to address the adverse modification standard over and above those recommended as necessary to avoid jeopardizing the continued existence of the Salina mucket. Therefore, only administrative costs are expected in approximately 69 percent of the proposed critical habitat designation. While this additional analysis will require time and resources by both the Federal action agency and the Service, it is believed that, in most circumstances, these costs would predominantly be administrative in nature and would not be significant.

The remaining 62.8 rmi (101.0 rkm) (31 percent of the total proposed critical

habitat designation) are currently unoccupied by the species but are essential for the conservation of the species. In these unoccupied areas, any conservation efforts or associated probable impacts would be considered incremental effects attributed to the critical habitat designation. Within the 62.8 rmi (101.0 rkm) of unoccupied critical habitat, few actions are expected to occur that will result in section 7 consultation or associated project modifications. Unoccupied critical habitat for the Salina mucket is entirely within Subunit SM–1b, Boquillas Canyon, which is almost exclusively managed NPS. Based upon communications with the NPS, we expect to consult only on future activities related to invasive riparian vegetation management, which are likely to be covered under a programmatic consultation. Therefore, we do not anticipate more than a just a few consultations in this subunit, with minor conservation efforts that would likely result in relatively low probable economic impacts.

A small portion (9 percent) of Subunit SM–1b is owned by the State of Texas. Although the entities most likely to incur incremental costs are Federal action agencies, such as NPS, in some cases, third parties, most frequently State agencies or municipalities, may also incur costs. However, based on coordination efforts with State and local agencies, we do not anticipate any cost to private entities within these sectors.

The probable incremental economic impacts of the Salina mucket's critical habitat designation are expected to be limited to additional administrative effort and the minor costs of conservation efforts resulting from a small number of future section 7 consultations. This limitation is due to two factors: (1) A large portion of proposed critical habitat stream reaches are considered to be occupied by the species (69 percent), and incremental economic impacts of critical habitat designation, other than administrative costs, are unlikely; and (2) in proposed areas that are not occupied by Salina mucket (31 percent), few actions are anticipated that would result in section 7 consultation or associated project modifications. At approximately $10,000 or less per consultation, the burden resulting from the designation of critical habitat for the Salina mucket, based on the anticipated annual number of consultations and associated consultation costs, is not expected to exceed $32,600 in most years. The designation is unlikely to trigger additional requirements under State or local regulations. Thus, the annual administrative burden is relatively low. Although the exact cost of project modifications resulting from projects in unoccupied habitat for the Salina mucket is uncertain, it is estimated to be less than $32,600 in a given year and is therefore unlikely to exceed $200 million in a single year.

Mexican Fawnsfoot

The proposed critical habitat designation for the Mexican fawnsfoot totals approximately 185.6 rmi (298.7 rkm), of which all is currently occupied by the species. In these areas, any actions that may affect the species or its habitat would also affect designated critical habitat, and it is unlikely that any additional conservation efforts would be recommended to address the adverse modification standard over and above those recommended as necessary to avoid jeopardizing the continued existence of the Mexican fawnsfoot. Therefore, only administrative costs are expected within the proposed critical habitat designation. While this additional analysis will require time and resources by both the Federal action agency and the Service, it is believed that, in most circumstances, these costs would predominantly be administrative in nature and would not be significant.

The probable incremental economic impacts of the Mexican fawnsfoot's critical habitat designation are expected to be limited to additional administrative effort resulting from a small number of future section 7 consultations. This is because all of the proposed critical habitat stream reaches are considered to be occupied by the species, and incremental economic impacts of critical habitat designation, other than administrative costs, are unlikely. At approximately $10,000 or less per consultation, the burden resulting from the designation of critical habitat for the Mexican fawnsfoot, based on the anticipated annual number of consultations and associated consultation costs, is not expected to exceed $11,000 in most years. The designation is unlikely to trigger additional requirements under State or local regulations. Thus, the annual administrative burden is relatively low.

While current development or other projects are not planned in proposed critical habitat areas, future planning efforts could be affected by proposed critical habitat designation. Any future probable incremental economic impacts are not likely to exceed $200 million in any single year, and impacts that are concentrated in any geographical area or sector are not likely as a result of this critical habitat designation.

We are soliciting data and comments from the public on the DEA discussed above. During the development of the final designations, we will consider the information presented in the DEA and any additional information on economic impacts we receive during the public comment period to determine whether any specific areas should be excluded from the final critical habitat designations under authority of section 4(b)(2) of the Act, our implementing regulations at 50 CFR 424.19, and the 2016 Policy. We may exclude an area from critical habitat if we determine that the benefits of excluding the area outweigh the benefits of including the area, provided the exclusion will not result in the extinction of this species.

Consideration of National Security Impacts

Section 4(a)(3)(B)(i) of the Act may not cover all DoD lands or areas that pose potential national-security concerns (*e.g.,* a DoD installation that is in the process of revising its INRMP for a newly listed species or a species previously not covered). If a particular area is not covered under section 4(a)(3)(B)(i), then national-security or homeland-security concerns are not a factor in the process of determining what areas meet the definition of ''critical habitat.'' However, the Service must still consider impacts on national security, including homeland security, on those lands or areas not covered by section 4(a)(3)(B)(i) because section 4(b)(2) requires the Service to consider those impacts whenever it designates critical habitat. Accordingly, if DoD, Department of Homeland Security (DHS), or another Federal agency has requested exclusion based on an assertion of national-security or homeland-security concerns, or we have otherwise identified national-security or homeland-security impacts from designating particular areas as critical habitat, we generally have reason to consider excluding those areas.

However, we cannot automatically exclude requested areas. When DoD, DHS, or another Federal agency requests exclusion from critical habitat on the basis of national-security or homeland-security impacts, we must conduct an exclusion analysis if the Federal requester provides information, including a reasonably specific justification of an incremental impact on national security that would result from the designation of that specific area as critical habitat. That justification could include demonstration of probable impacts, such as impacts to ongoing border-security patrols and surveillance activities, or a delay in

training or facility construction, as a result of compliance with section 7(a)(2) of the Act. If the agency requesting the exclusion does not provide us with a reasonably specific justification, we will contact the agency to recommend that it provide a specific justification or clarification of its concerns relative to the probable incremental impact that could result from the designation. If we conduct an exclusion analysis because the agency provides a reasonably specific justification or because we decide to exercise the discretion to conduct an exclusion analysis, we will defer to the expert judgment of DoD, DHS, or another Federal agency as to: (1) Whether activities on its lands or waters, or its activities on other lands or waters, have national-security or homeland-security implications; (2) the importance of those implications; and (3) the degree to which the cited implications would be adversely affected in the absence of an exclusion. In that circumstance, in conducting a discretionary section 4(b)(2) exclusion analysis, we will give great weight to national-security and homeland-security concerns in analyzing the benefits of exclusion.

In preparing this proposal, we have determined that the lands within the proposed critical habitat designations for the Salina mucket and Mexican fawnsfoot are not owned or managed by the DoD or DHS, and, therefore, we anticipate no impact on national security or homeland security.

Consideration of Other Relevant Impacts

Under section 4(b)(2) of the Act, we consider any other relevant impacts, in addition to economic impacts and impacts on national security discussed above. To identify other relevant impacts that may affect the exclusion analysis, we consider a number of factors, including whether there are permitted conservation plans covering the species in the area—such as HCPs, safe harbor agreements (SHAs), or candidate conservation agreements with assurances (CCAAs)—or whether there are non-permitted conservation agreements and partnerships that may be impaired by designation of, or exclusion from, critical habitat. In addition, we look at whether Tribal conservation plans or partnerships, Tribal resources, or government-to-government relationships of the United States with Tribal entities may be affected by the designations. We also consider any State, local, social, or other impacts that might occur because of the designations.

Tribal Lands

Several Executive Orders, Secretary's Orders, and policies concern working with Tribes. These guidance documents generally confirm our trust responsibilities to Tribes, recognize that Tribes have sovereign authority to control Tribal lands, emphasize the importance of developing partnerships with Tribal governments, and direct the Service to consult with Tribes on a government-to-government basis.

A joint Secretary's Order that applies to both the Service and the National Marine Fisheries Service (NMFS)—Secretary's Order 3206, *American Indian Tribal Rights, Federal-Tribal Trust Responsibilities, and the Endangered Species Act* (June 5, 1997) (S.O. 3206)—is the most comprehensive of the various guidance documents related to Tribal relationships and Act implementation, and it provides the most detail directly relevant to the designation of critical habitat. In addition to the general direction discussed above, the appendix to S.O. 3206 explicitly recognizes the right of Tribes to participate fully in any listing process that may affect Tribal rights or Tribal trust resources; this includes the designation of critical habitat. Section 3(B)(4) of the appendix requires the Service to consult with affected Tribes ''when considering the designation of critical habitat in an area that may impact Tribal trust resources, Tribally-owned fee lands, or the exercise of Tribal rights.'' That provision also instructs the Service to avoid including Tribal lands within a critical habitat designation unless the area is essential to conserve a listed species, and it requires the Service to ''evaluate and document the extent to which the conservation needs of the listed species can be achieved by limiting the designation to other lands.''

Our implementing regulations at 50 CFR 424.19 and the 2016 Policy are consistent with S.O. 3206. When we undertake a discretionary exclusion analysis under section 4(b)(2) of the Act, in accordance with S.O. 3206, we consult with any Tribe whose Tribal trust resources, tribally owned fee lands, or Tribal rights may be affected by including any particular areas in a critical habitat designation. We evaluate the extent to which the conservation needs of the species can be achieved by limiting the designation to other areas and give great weight to Tribal concerns in analyzing the benefits of exclusion.

However, S.O. 3206 does not override the Act's statutory requirement of designation of critical habitat. As stated above, we must consult with any Tribe when a designation of critical habitat may affect Tribal lands or resources. The Act requires us to identify areas that meet the definition of ''critical habitat'' (*i.e.,* areas occupied at the time of listing that contain the essential physical or biological features that may require special management considerations or protection and unoccupied areas that are essential to the conservation of a species), without regard to land ownership. While S.O. 3206 provides important direction, it expressly states that it does not modify the Secretary's statutory authority under the Act or other statutes.

The proposed critical habitat designation for the Mexican fawnsfoot includes a portion of the Kickapoo Indian Reservation of Texas. This Tribe does not have a management or conservation plan for the Mexican fawnsfoot; however, we will consider any requests for exclusion we receive during the public comment period for this proposed rule (see **DATES**, above).

Federal Lands

Federal land managers have unique obligations under the Act. First, Congress declared its policy that all Federal departments and agencies shall seek to conserve endangered species and threatened species and shall utilize their authorities in furtherance of the purposes of the Act (section 2(c)(1)). Second, all Federal agencies have responsibilities under section 7 of the Act to carry out programs for the conservation of listed species and to ensure their actions are not likely to jeopardize the continued existence of listed species or result in the destruction or adverse modification of critical habitat. Therefore, in general, we focus our exclusions on non-Federal lands. Our regulations at 50 CFR 424.19 and the 2016 Policy provide for the consideration of the exclusion of Federal lands in particular instances.

We have not identified any areas to consider for exclusion from critical habitat based on other relevant impacts because there are no identified relevant impacts to Tribes, States, or local governments, and there are no permitted conservation plans covering the species. However, during the development of final designations, we will consider all information currently available or received during the public comment period on this proposed rule (see **DATES**, above) that we determine indicates that there is a potential for the benefits of exclusion to outweigh the benefits of inclusion. If we evaluate information regarding a request for an exclusion and we do not exclude, we will fully describe our rationale for not excluding

in the final critical habitat determinations. We may also exercise the discretion to undertake exclusion analyses for other areas as well, and we will describe all of our exclusion analyses as part of our final critical habitat determinations.

Summary of Exclusions Considered Under Section 4(b)(2) of the Act

At this time, we are not considering any exclusions from the proposed designations based on economic impacts, national security impacts, or other relevant impacts—such as partnerships, management, or protection afforded by cooperative management efforts—under section 4(b)(2) of the Act. We are not aware of any conservation plans, such as management plans or other large-scale habitat conservation plans, that would benefit the Rio Grande mussels within the proposed designations.

However, if through the public comment period we receive information that we determine indicates that there are economic, national security, or other relevant impacts from designating particular areas as critical habitat, then as part of developing the final designations of critical habitat, we will evaluate that information and may conduct a discretionary exclusion analysis to determine whether to exclude those areas under the authority of section 4(b)(2) of the Act and our implementing regulations at 50 CFR 424.19. If we receive a request for exclusion of a particular area and after evaluation of supporting information we do not exclude, we will fully explain our decision in the final rule for this action. (Please see **ADDRESSES**, above, for instructions on how to submit comments.)

Required Determinations

Clarity of the Rule

We are required by E.O.s 12866 and 12988 and by the Presidential Memorandum of June 1, 1998, to write all rules in plain language. This means that each rule we publish must:

(1) Be logically organized;

(2) Use the active voice to address readers directly;

(3) Use clear language rather than jargon;

(4) Be divided into short sections and sentences; and

(5) Use lists and tables wherever possible.

If you feel that we have not met these requirements, send us comments by one of the methods listed in **ADDRESSES**. To better help us revise the rule, your comments should be as specific as possible. For example, you should tell us the numbers of the sections or paragraphs that are unclearly written, which sections or sentences are too long, the sections where you feel lists or tables would be useful, etc.

Regulatory Planning and Review—Executive Orders 12866, 13563, and 14094

Executive Order 14094 reaffirms the principles of E.O. 12866 and E.O. 13563 and states that regulatory analysis should facilitate agency efforts to develop regulations that serve the public interest, advance statutory objectives, and are consistent with E.O. 12866, E.O. 13563, and the Presidential Memorandum of January 20, 2021 (Modernizing Regulatory Review). Regulatory analysis, as practicable and appropriate, shall recognize distributive impacts and equity, to the extent permitted by law. E.O. 13563 emphasizes further that regulations must be based on the best available science and that the rulemaking process must allow for public participation and an open exchange of ideas. We have developed this final rule in a manner consistent with these requirements.

E.O. 12866, as reaffirmed by E.O. 13563 and E.O. 14094, provides that the Office of Information and Regulatory Affairs (OIRA) in the Office of Management and Budget (OMB) will review all significant rules. OIRA has determined that this rule is not significant.

Regulatory Flexibility Act (5 U.S.C. 601 et seq.)

Under the Regulatory Flexibility Act (RFA; 5 U.S.C. 601 et seq.), as amended by the Small Business Regulatory Enforcement Fairness Act of 1996 (SBREFA; 5 U.S.C. 801 et seq.), whenever an agency is required to publish a notice of rulemaking for any proposed or final rule, it must prepare and make available for public comment a regulatory flexibility analysis that describes the effects of the rule on small entities (*i.e.,* small businesses, small organizations, and small government jurisdictions). However, no regulatory flexibility analysis is required if the head of the agency certifies the rule will not have a significant economic impact on a substantial number of small entities. The SBREFA amended the RFA to require Federal agencies to provide a certification statement of the factual basis for certifying that the rule will not have a significant economic impact on a substantial number of small entities.

According to the Small Business Administration, small entities include small organizations such as independent nonprofit organizations; small governmental jurisdictions, including school boards and city and town governments that serve fewer than 50,000 residents; and small businesses (13 CFR 121.201). Small businesses include manufacturing and mining concerns with fewer than 500 employees, wholesale trade entities with fewer than 100 employees, retail and service businesses with less than $5 million in annual sales, general and heavy construction businesses with less than $27.5 million in annual business, special trade contractors doing less than $11.5 million in annual business, and agricultural businesses with annual sales less than $750,000. To determine whether potential economic impacts to these small entities are significant, we considered the types of activities that might trigger regulatory impacts under this designation as well as types of project modifications that may result. In general, the term ''significant economic impact'' is meant to apply to a typical small business firm's business operations.

Under the RFA, as amended, and as understood in light of recent court decisions, Federal agencies are required to evaluate the potential incremental impacts of rulemaking on those entities directly regulated by the rulemaking itself; in other words, the RFA does not require agencies to evaluate the potential impacts to indirectly regulated entities. The regulatory mechanism through which critical habitat protections are realized is section 7 of the Act, which requires Federal agencies, in consultation with the Service, to ensure that any action authorized, funded, or carried out by the agency is not likely to destroy or adversely modify critical habitat. Therefore, under section 7, only Federal action agencies are directly subject to the specific regulatory requirement (avoiding destruction and adverse modification) imposed by critical habitat designation. Consequently, it is our position that only Federal action agencies would be directly regulated if we adopt the proposed critical habitat designations. The RFA does not require evaluation of the potential impacts to entities not directly regulated. Moreover, Federal agencies are not small entities. Therefore, because no small entities would be directly regulated by this rulemaking, the Service certifies that, if made final as proposed, the proposed critical habitat designations will not have a significant economic impact on a substantial number of small entities.

In summary, we have considered whether the proposed designations

would result in a significant economic impact on a substantial number of small entities. For the above reasons and based on currently available information, we certify that, if made final, the proposed critical habitat designations will not have a significant economic impact on a substantial number of small business entities. Therefore, an initial regulatory flexibility analysis is not required.

Energy Supply, Distribution, or Use—Executive Order 13211

Executive Order 13211 (Actions Concerning Regulations That Significantly Affect Energy Supply, Distribution, or Use) requires agencies to prepare Statements of Energy Effects when undertaking certain actions. In our DEA, we did not find that these proposed critical habitat designations would significantly affect energy supplies, distribution, or use. We did not find that these proposed critical habitat designations will have an annual effect on the economy of $200 million or more or significantly affect energy supplies, distribution, or use due to the lack of any energy supply or distribution lines within the proposed critical habitat designations. Therefore, this action is not a significant energy action, and no statement of energy effects is required.

Unfunded Mandates Reform Act (2 U.S.C. 1501 et seq.)

In accordance with the Unfunded Mandates Reform Act (2 U.S.C. 1501 et seq.), we make the following finding:

(1) This proposed rule would not produce a Federal mandate. In general, a Federal mandate is a provision in legislation, statute, or regulation that would impose an enforceable duty upon State, local, or Tribal governments, or the private sector, and includes both ''Federal intergovernmental mandates'' and ''Federal private sector mandates.'' These terms are defined in 2 U.S.C. 658(5)–(7). ''Federal intergovernmental mandate'' includes a regulation that ''would impose an enforceable duty upon State, local, or Tribal governments'' with two exceptions. It excludes ''a condition of Federal assistance.'' It also excludes ''a duty arising from participation in a voluntary Federal program,'' unless the regulation ''relates to a then-existing Federal program under which $500,000,000 or more is provided annually to State, local, and Tribal governments under entitlement authority,'' if the provision would ''increase the stringency of conditions of assistance'' or ''place caps upon, or otherwise decrease, the Federal Government's responsibility to provide funding,'' and the State, local, or Tribal governments ''lack authority'' to adjust accordingly. At the time of enactment, these entitlement programs were: Medicaid; Aid to Families with Dependent Children work programs; Child Nutrition; Food Stamps; Social Services Block Grants; Vocational Rehabilitation State Grants; Foster Care, Adoption Assistance, and Independent Living; Family Support Welfare Services; and Child Support Enforcement. ''Federal private sector mandate'' includes a regulation that ''would impose an enforceable duty upon the private sector, except (i) a condition of Federal assistance or (ii) a duty arising from participation in a voluntary Federal program.''

The designation of critical habitat does not impose a legally binding duty on non-Federal Government entities or private parties. Under the Act, the only regulatory effect is that Federal agencies must ensure that their actions are not likely to destroy or adversely modify critical habitat under section 7. While non-Federal entities that receive Federal funding, assistance, or permits, or that otherwise require approval or authorization from a Federal agency for an action, may be indirectly impacted by the designation of critical habitat, the legally binding duty to avoid destruction or adverse modification of critical habitat rests squarely on the Federal agency. Furthermore, to the extent that non-Federal entities are indirectly impacted because they receive Federal assistance or participate in a voluntary Federal aid program, the Unfunded Mandates Reform Act would not apply, nor would critical habitat shift the costs of the large entitlement programs listed above onto State governments.

(2) We do not believe that this rule would significantly or uniquely affect small governments because the units do not occur within the jurisdiction of small governments. Therefore, a Small Government Agency Plan is not required.

We do not believe that this rule will significantly or uniquely affect small governments because small governments will be affected only to the extent that any programs having Federal funds, permits, or other authorized activities must ensure that their actions will not adversely affect critical habitat. This rule will not produce a Federal mandate of $200 million or greater in any year; that is, it is not a ''significant regulatory action'' under the Unfunded Mandates Reform Act. The designation of critical habitat imposes no obligations on State or local governments. By definition, Federal agencies are not considered small entities, although the activities they fund or permit may be proposed or carried out by small entities. Consequently, we do not find that the proposed critical habitat designations will significantly or uniquely affect small government entities. Therefore, a Small Government Agency Plan is not required.

Takings—Executive Order 12630

In accordance with E.O. 12630 (Government Actions and Interference with Constitutionally Protected Private Property Rights), we have analyzed the potential takings implications of designating critical habitat for the Salina mucket and Mexican fawnsfoot in a takings implications assessment. The Act does not authorize the Service to regulate private actions on private lands or confiscate private property as a result of critical habitat designation. Designation of critical habitat does not affect land ownership, or establish any closures of, or restrictions on use of or access to, the designated areas. Furthermore, the designation of critical habitat does not affect landowner actions that do not require Federal funding or permits, nor does it preclude development of habitat conservation programs or issuance of incidental take permits to permit actions that do require Federal funding or permits to go forward. However, Federal agencies are prohibited from carrying out, funding, or authorizing actions that would destroy or adversely modify critical habitat. A takings implications assessment has been completed for the proposed designation of critical habitat for the Salina mucket and Mexican fawnsfoot, and it concludes that, if adopted, these critical habitat designations do not pose significant takings implications for lands within or affected by the designations.

Federalism—Executive Order 13132

In accordance with E.O. 13132 (Federalism), this proposed rule does not have significant Federalism effects. A federalism summary impact statement is not required. In keeping with Department of the Interior and Department of Commerce policy, we requested information from, and coordinated development of these proposed critical habitat designations with, appropriate State resource agencies. From a federalism perspective, the designation of critical habitat directly affects only the responsibilities of Federal agencies. The Act imposes no other duties with respect to critical habitat, either for States and local governments, or for anyone else. As a result, the proposed rule does not have

substantial direct effects either on the States, or on the relationship between the Federal government and the States, or on the distribution of powers and responsibilities among the various levels of government. The proposed designations may have some benefit to these governments because the areas that contain the features essential to the conservation of the species are more clearly defined, and the physical or biological features of the habitat necessary for the conservation of the species are specifically identified. This information does not alter where and what federally sponsored activities may occur. However, it may assist State and local governments in long-range planning because they no longer have to wait for case-by-case section 7 consultations to occur.

Where State and local governments require approval or authorization from a Federal agency for actions that may affect critical habitat, consultation under section 7(a)(2) of the Act would be required. While non-Federal entities that receive Federal funding, assistance, or permits, or that otherwise require approval or authorization from a Federal agency for an action, may be indirectly impacted by the designation of critical habitat, the legally binding duty to avoid destruction or adverse modification of critical habitat rests squarely on the Federal agency.

Civil Justice Reform—Executive Order 12988

In accordance with E.O. 12988 (Civil Justice Reform), the Office of the Solicitor has determined that the rule would not unduly burden the judicial system and that it meets the requirements of sections 3(a) and 3(b)(2) of the Order. We have proposed designating critical habitat in accordance with the provisions of the Act. To assist the public in understanding the habitat needs of the species, this proposed rule identifies the physical or biological features essential to the conservation of the species. The proposed areas of critical habitat are presented on maps, and the proposed rule provides several options for the interested public to obtain more detailed location information, if desired.

Paperwork Reduction Act of 1995 (44 U.S.C. 3501 et seq.)

This rule does not contain information collection requirements, and a submission to the Office of Management and Budget (OMB) under the Paperwork Reduction Act of 1995 (44 U.S.C. 3501 et seq.) is not required. We may not conduct or sponsor and you are not required to respond to a collection of information unless it displays a currently valid OMB control number.

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. In a line of cases starting with *Douglas County* v. *Babbitt,* 48 F.3d 1495 (9th Cir. 1995), the courts have upheld this position.

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), E.O. 13175 (Consultation and Coordination with Indian Tribal Governments), and the Department of the Interior's manual at 512 DM 2, we readily acknowledge our responsibility to communicate meaningfully with federally recognized Tribes on a government-to-government basis. In accordance with Secretary's 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. There are Tribal lands in Texas included in this proposed designation of critical habitat for the Mexican fawnsfoot. The Kickapoo Indian Reservation of Texas owns 0.7 rmi (1.1 rkm) adjacent to the Rio Grande in Unit MXFF–1, Laredo Reach. A notification letter was sent to the Kickapoo Indian Reservation of Texas as part of the SSA process, but no response was received at that time. However, we will continue to work with Tribal entities during the development of a final rule to designate critical habitat for the Mexican fawnsfoot. We have determined that no Tribal lands fall within the boundaries of the proposed critical habitat for the Salina mucket, so no Tribal lands would be affected by the designation for that species.

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 Austin Ecological Services Field Office (see **FOR FURTHER INFORMATION CONTACT**).

Authors

The primary authors of this proposed rule are the staff members of the Fish and Wildlife Service's Species Assessment Team and the Austin 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.

Signing Authority

Martha Williams, Director of the U.S. Fish and Wildlife Service, approved this action on June 21, 2023, for publication. On July 14, 2023, Martha Williams authorized the undersigned to sign the document electronically and submit it to the Office of the Federal Register for publication as an official document of the U.S. Fish and Wildlife Service.

Proposed Regulation Promulgation

Accordingly, we propose to 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 ''Fawnsfoot, Mexican'' and ''Mucket, Salina'' in alphabetical order under CLAMS to read as follows:

§ 17.11 Endangered and threatened wildlife.

* * * * *

(h) * * *

Common name	Scientific name	Where listed	Status	Listing citations and applicable rules
*	*	*	*	* *
		Clams		
*	*	*	*	* *
Fawnsfoot, Mexican	*Truncilla cognata*	Wherever found	E	(**Federal Register** citation when published as a final rule); 50 CFR 17.95(f).[CH]
*	*	*	*	* *
Mucket, Salina	*Potamilus metnecktayi*	Wherever found	E	(**Federal Register** citation when published as a final rule); 50 CFR 17.95(f).[CH]
*	*	*	*	* *

■ 3. In § 17.95, amend paragraph (f) by:
■ a. Adding an entry for ''Mexican Fawnsfoot (*Truncilla cognata*)'' before the entry for ''Carolina Heelsplitter (*Lasmigona decorata*)''; and
■ b. Adding an entry for ''Salina Mucket (*Potamilus metnecktayi*)'' following the entry for ''Carolina Heelsplitter (*Lasmigona decorata*)''.

The additions read as follows.

§ 17.95 Critical habitat—fish and wildlife.

* * * * *

(f) *Clams and Snails.*

* * * * *

Mexican Fawnsfoot (*Truncilla cognata*)

(1) Critical habitat units are depicted for Maverick, Webb, and Zapata Counties, Texas, on the maps in this entry.

(2) Within these areas, the physical or biological features essential to the conservation of Mexican fawnsfoot consist of a riverine system with habitat to support all life stages of the species, which includes:

(i) Flowing water at rates high enough to support clean-swept substrate but not so high as to dislodge individuals;

(ii) Stable areas of small-grained sediment, such as clay, silt, or sand;

(iii) Flow refugia such as riffle and run habitats, adjacent depositional areas, and banks;

(iv) The presence of freshwater drum (*Aplodinotus grunniens*) or other identified host fish; and

(v) Water quality parameters within the following ranges:

(A) Salinity below approximately 1.0 parts per thousand (ppt);

(B) Ammonia below 0.7 milligrams per liter (mg/L);

(C) Low levels of contaminants; and

(D) Dissolved oxygen levels within substrate greater than 1.3 mg/L.

(3) Critical habitat does not include manmade structures (such as buildings, aqueducts, runways, roads, and other paved areas) and the land on which they are located existing within the legal boundaries on the effective date of the final rule.

(4) Data layers defining map units were created were created using U.S. Geological Survey digital ortho-photo quarter-quadrangles, and critical habitat units were then mapped using Universal Transverse Mercator (UTM) Zone 15N coordinates. The maps in this entry, as modified by any accompanying regulatory text, establish the boundaries of the critical habitat designation. The coordinates or plot points or both on which each map is based are available to the public at the Service's internet site at *https://www.regulations.gov* at Docket No. FWS–R2–ES–2023–0026 and at the field office responsible for this designation. You may obtain field office location information by contacting one of the Service regional offices, the addresses of which are listed at 50 CFR 2.2.

(5) Unit MXFF–1: Laredo Reach; Maverick, Webb, and Zapata Counties, Texas.

(i) Unit MXFF–1 consists of 185.6 river miles (rmi) (298.7 river kilometers (rkm)) in Maverick, Webb, and Zapata Counties and is composed of lands in Tribal (0.7 rmi (1.1 rkm)), State/local (3.7 rmi (6.0 rkm)), and private (181.2 rmi (291.6 rkm)) ownership.

(ii) Map of Unit MXFF–1 follows:

Figure 1 to Mexican Fawnsfoot (*Truncilla cognata*) paragraph (5)(ii)

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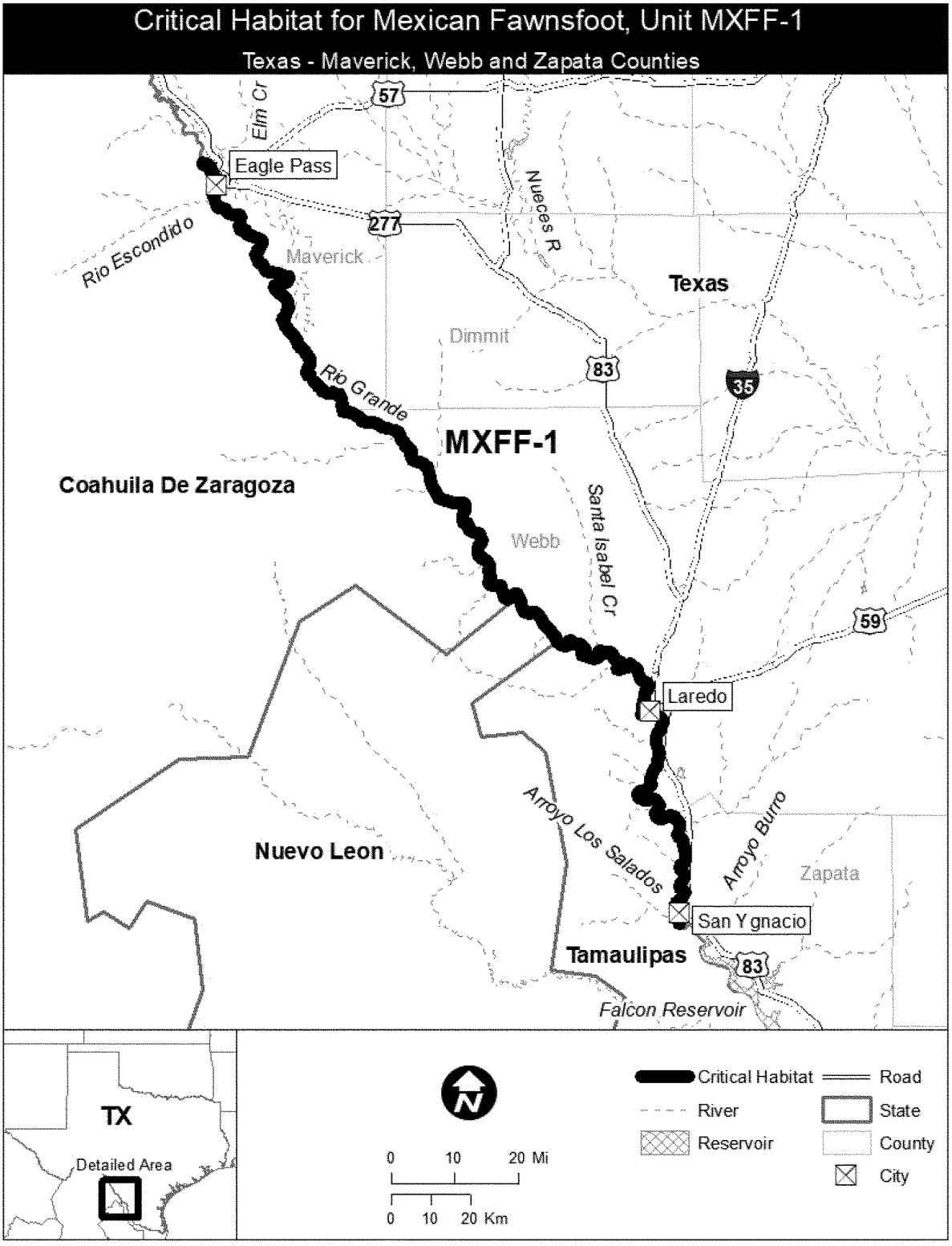


* * * * *

Salina Mucket (*Potamilus metnecktayi*)

(1) Critical habitat units are depicted for Brewster, Terrell, and Val Verde Counties, Texas, on the maps in this entry.

(2) Within these areas, the physical or biological features essential to the conservation of Salina mucket consist of a riverine system with habitat to support all life stages of the species, which includes:

(i) Flowing water at rates high enough to support clean-swept substrate but not so high as to dislodge individuals;

(ii) Crevices beneath boulders, beneath shelves, and within undercut banks with seams of fine sediment;

(iii) The presence of freshwater drum (*Aplodinotus grunniens*) or other identified host fish; and

(iv) Water quality parameters within the following ranges:

(A) Salinity below approximately 1.0 parts per thousand (ppt);

(B) Ammonia below 0.7 milligrams per liter (mg/L);

(C) Low levels of contaminants; and

(D) Dissolved oxygen levels within substrate greater than 1.3 mg/L.

(3) Critical habitat does not include manmade structures (such as buildings, aqueducts, runways, roads, and other paved areas) and the land on which they are located existing within the legal boundaries on the effective date of the final rule.

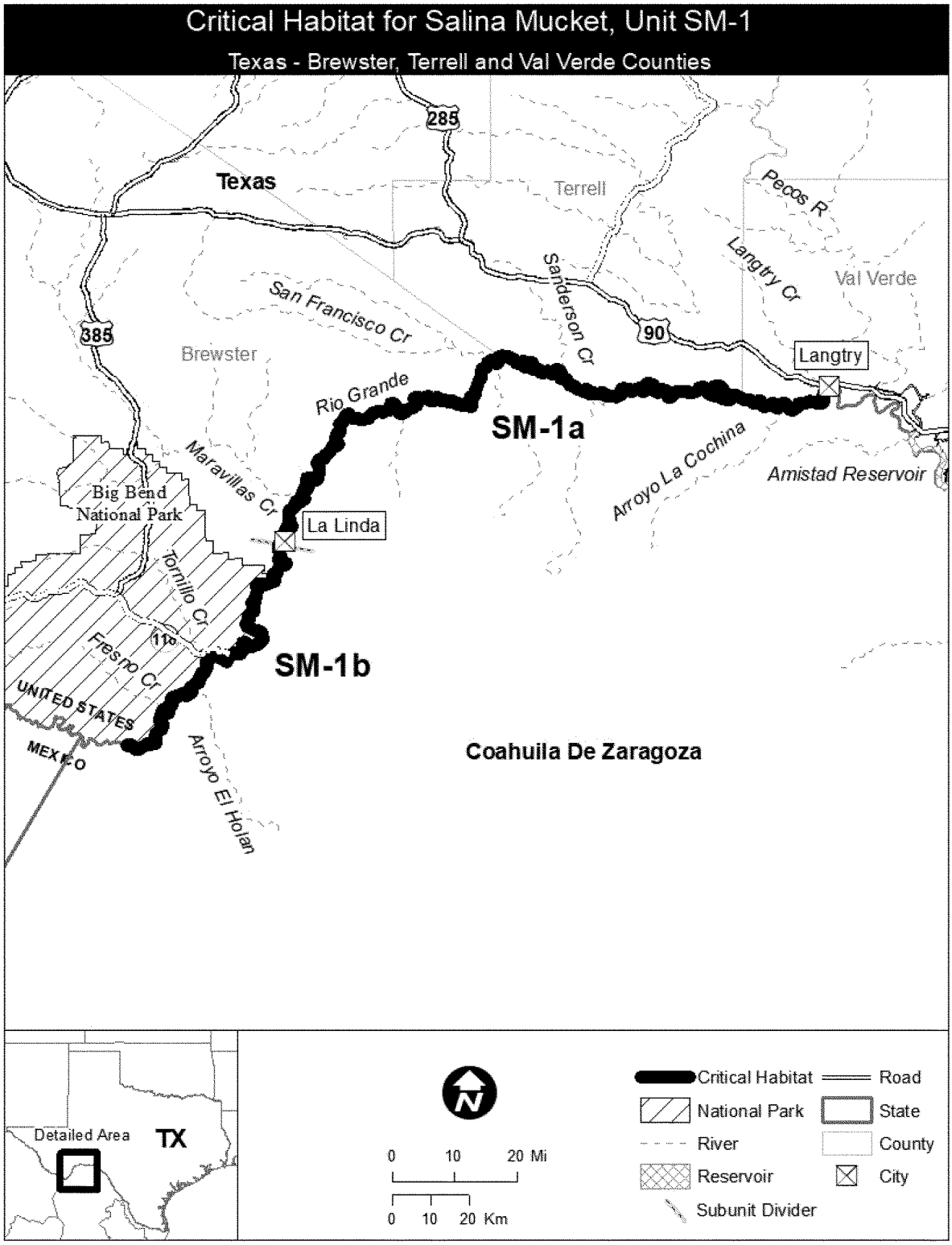
(4) Data layers defining map units were created using U.S. Geological Survey digital ortho-photo quarter-quadrangles, and critical habitat units were then mapped using Universal Transverse Mercator (UTM) Zones 13 and 14N coordinates. The maps in this entry, as modified by any accompanying regulatory text, establish the boundaries of the critical habitat designation. The coordinates or plot points or both on which each map is based are available to the public at the Service's internet site at *https://www.regulations.gov* at Docket No. FWS–R2–ES–2023–0026 and at the field office responsible for this designation. You may obtain field office location information by contacting one of the Service regional offices, the addresses of which are listed at 50 CFR 2.2.

(5) Unit SM–1: Rio Grande; Brewster, Terrell, and Val Verde Counties, Texas.

(i) Unit SM–1 consists of 199.6 river miles (rmi) (321.0 river kilometers (rkm)) in Brewster, Terrell, and Val Verde Counties and is composed of lands in Federal (117.7 rmi (189.33 rkm)), State (23.9 rmi (38.4 rkm)), and private (58.0 rmi (93.3 rkm)) ownership.

(ii) Map of Unit SM–1 follows:

Figure 1 to Salina Mucket (*Potamilus metnecktayi*) paragraph (5)(ii)


Critical Habitat for Salina Mucket, Unit SM-1
Texas - Brewster, Terrell and Val Verde Counties
285
Texas
Terrell
Pecos R.
Langtry Cr
Val Verde
Sanderson Cr
San Francisco Cr
385
90
Brewster
Langtry
Rio Grande
SM-1a
Maravillas Cr
Arroyo La Cochina
Amistad Reservoir
Big Bend National Park
La Linda
Tornillo Cr
Fresno Cr
110
SM-1b
UNITED STATES
MEXICO
Arroyo El Holan
Coahuila De Zaragoza
Detailed Area
TX
0 10 20 Mi
0 10 20 Km
Critical Habitat
Road
National Park
State
River
County
Reservoir
City
Subunit Divider

* * * * *

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[FR Doc. 2023–15360 Filed 7–24–23; 8:45 am]

BILLING CODE 4333–15–C