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DEPARTMENT OF THE INTERIOR

Fish and Wildlife Service

50 CFR Part 17

[Docket No. FWS–R3–ES–2026–4390; FXES1111090FEDR–267–FF09E21000]

RIN 1018–BH36

Endangered and Threatened Wildlife and Plants; Threatened Species Status with a Section 4(d) Rule for Blanding's turtle

AGENCY: Fish and Wildlife Service, Interior.

ACTION: Proposed rule.

SUMMARY: We, the U.S. Fish and Wildlife Service (Service), propose to list the Blanding's turtle (*Emydoidea blandingii*), a reptile species from 14 States in the midwestern and eastern regions of the United States and 3 Provinces in eastern Canada, as a threatened species under the Endangered Species Act of 1973, as amended (Act). This determination also serves as our 12-month finding on a petition to list the Blanding's turtle. After a review of the best scientific and commercial data available, we find that listing the species is warranted. If we finalize this rule as proposed, it would add this species to the List of Endangered and Threatened Wildlife and extend the Act's protections to the species. We find that designating critical habitat for this species is not prudent.

DATES: Comments will be accepted on or before [INSERT DATE 60 DAYS AFTER DATE OF PUBLICATION IN THE *FEDERAL REGISTER*]. 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 [INSERT DATE 45 DAYS AFTER DATE OF PUBLICATION IN THE *FEDERAL REGISTER*].

To ensure your comment is received and considered, you must submit it using one of the methods identified in the **ADDRESSES** section of this document. Comments submitted through any method not authorized in this document, or sent to an address not listed here, will not be considered.

ADDRESSES: *Comment submission:* All submissions must include the docket number (FWS–R3–ES–2026–4390) for this document. You must submit comments using one of the following methods:

(1) *Electronic submission*: Federal eRulemaking Portal at: https://www.regulations.gov. In the Search box, enter FWS–R3–ES–2026–4390, which is the docket number for this rulemaking. Then, click the Search button. On the resulting page, you may submit a comment by clicking on "Comment." Please ensure that you have found the correct document before submitting your comments.

(2) *U.S. mail*: Public Comments Processing, Attn: Docket No. FWS–R3–ES–2026–4390, Policy and Regulations Branch, U.S. Fish and Wildlife Service, MS: PRB (JAO/3W), 5275 Leesburg Pike, Falls Church, VA 22041–3803.

Comments submitted through any method not authorized in this document, or sent to an address not listed here, will not be considered. We will not accept comments via email, fax, or hand delivery. We are not required to consider comments that are submitted after the comment period ends or that are submitted via a method outside of these instructions. Comments containing profanity, vulgarity, threats, or other inappropriate content will not be considered.

We will post all comments on https://www.regulations.gov. You may request that we withhold personal identifying information from public review; however, we cannot

guarantee that we will be able to do so. See **Information Requested**, below, for more information.

Availability of supporting materials: Supporting materials, such as the species status assessment report, are available at https://www.regulations.gov under Docket No. FWS–R3–ES–2026–4390.

FOR FURTHER INFORMATION CONTACT: Kraig McPeek, Field Office Supervisor, Illinois-Iowa Ecological Services Field Office; 309–757–5800; rockisland@fws.gov. Individuals in the United States who are deaf, deafblind, hard of hearing, or have a speech disability may dial 711 (TTY, TDD, or TeleBraille) to access telecommunications relay services. Individuals outside the United States should use the relay services offered within their country to make international calls to the point-of-contact in the United States.

SUPPLEMENTARY INFORMATION:

Executive Summary

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

What this document does. We propose to add the Blanding's turtle as a threatened species to the List of Endangered and Threatened Wildlife in title 50 of the Code of

Federal Regulations (CFR) at 50 CFR 17.11 and with a rule issued under section 4(d) of the Act (a "4(d) rule") at 50 CFR 17.42.

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 Blanding's turtle meets the Act's definition of a threatened species due to the following threats: habitat loss, fragmentation, and degradation; road mortality; increased nest predation; and increasing temperatures and changing precipitation patterns.

Section 4(a)(3) of the Act requires that the Secretary of the Interior (Secretary), to the maximum extent prudent and determinable, concurrently with listing designate critical habitat for the species. 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.

We are not proposing to designate any critical habitat for the Blanding's turtle because we find designating critical habitat for the Blanding's turtle is not prudent.

List of Abbreviations and Acronyms

We use many abbreviations and acronyms in this proposed rule. For the convenience of the reader, we define some of them here:

ac = acres

AUs = analytical units

BMPs = Best Management Practices

CITES = Convention on International Trade in Endangered Species of Wild Fauna and Flora

cm = centimeters

COSEWIC = The Committee on the Status of Endangered Wildlife in Canada

DoW = Department of War

EO = element occurrence

ft = feet

ha = hectares

HCP = habitat conservation plan

in = inches

km = kilometers

km^2 = square kilometers

m = meters

mm = millimeters

mi = miles

mi^2 = square miles

MWPARC = Midwest Partners in Amphibian and Reptile Conservation

NEBTWG = Northeast Blanding's Turtle Working Group

PCBs = polychlorinated biphenyls

PAHs = polycyclic aromatic hydrocarbons

RPUs = representation units

SSA = species status assessment

SSP = Shared Socioeconomic Pathway

yd = yards

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) The 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 patterns and the locations of any additional populations of this species;

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

(e) Past and ongoing conservation measures for the species, its habitat, or both.

(2) Threats and conservation actions affecting the 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 this species; and

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

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

(4) Information to assist us with applying or issuing protective regulations under section 4(d) of the Act that may be necessary and advisable to provide for the conservation of the Blanding's turtle. In particular, we seek information concerning:

(a) The extent to which we should include any of the Act's section 9 prohibitions in the 4(d) rule;

(b) Whether we should consider any additional or different exceptions from the prohibitions in the 4(d) rule (including import, export, take, activities with unlawfully taken specimens, and activities in interstate or foreign commerce);

(c) Impacts (conservation and economic) associated with implementing the 4(d) rule;

(d) How frequently and in what geographical areas are activities that we propose to regulate under the 4(d) rule (e.g., sale, "take") currently occurring;

(e) Whether there are other laws currently in place beyond what we describe in the economic considerations document that regulate the activities or "take" prohibited in the proposed 4(d) rule;

(f) Any entities likely to request section 10(a)(1)(A) permits for conducting activities that would involve "take" such as capture or handling of the Blanding's turtle;

(g) Data available on the time and economic costs of obtaining section 10(a)(1)(A) permits in accordance with 50 CFR 17.32;

(h) Whether we should consider an exception for interstate commerce of live Blanding's turtles bred in captivity in the United States in accordance with the requirements of the Convention on International Trade in Endangered Species of Wild

Fauna and Flora (CITES); or an exception for interstate commerce of live Blanding's turtles from one public institution to another public institution;

(i) Any entities likely to develop habitat conservation plans (HCPs) and request section 10(a)(1)(B) permits for conducting activities that would involve incidental "take" of the Blanding's turtle that we propose to prohibit;

(j) Data available on the time and economic costs of obtaining section 10(a)(1)(B) permits in accordance with 50 CFR 17.32;

(k) Any other entities not addressed in this proposed rule that may be affected by the 4(d) rule; and

(l) Comments and suggestions regarding additional guidance and methods that we could provide or use, respectively, to streamline the implementation of this proposed 4(d) rule.

(5) Information regarding our determination that designating critical habitat for the Blanding's turtle is not prudent.

Please include any supplemental 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, as 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 must submit your comments and materials concerning this proposed rule by one of the methods listed 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 and a plain language summary of the 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, we may conclude that the species is endangered instead of threatened, or we may conclude that the species does not warrant listing as either an endangered species or a threatened species. In addition, we may change the parameters of the prohibitions or the exceptions to those prohibitions in the protective regulations issued under section 4(d) of the Act if we conclude it is appropriate in light of comments and new information received. For example, we may expand the prohibitions if we conclude that the protective regulation as a whole, including those additional prohibitions, is necessary and advisable to provide for the conservation of the species. Conversely, we may establish additional or different exceptions to the prohibitions in the final rule if we conclude that the activities would facilitate or are compatible with the conservation and recovery 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 July 11, 2012, we were petitioned to list 53 species of reptiles and amphibians, including the Blanding's turtle, as endangered species or threatened species and to designate critical habitat for these species under the Act. In response to the petition, we published a 90-day finding on July 1, 2015 (80 FR 37568), in which we announced our finding that the petition contained substantial information that listing may be warranted for numerous species, including the Blanding's turtle.

Peer Review

We conducted a SSA and prepared an SSA report for the Blanding's turtle. The SSA report documents the results of our comprehensive biological review of the best scientific and commercial data available regarding the viability of the species, which is then used to support our decision regarding whether a species warrants listing under the Act.

In accordance with our joint policy with the National Marine Fisheries Service (NMFS) on peer review that 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 and recovery actions under the Act (https://www.fws.gov/sites/default/files/documents/peer-review-policy-directors-memo-2016-08-22.pdf), we solicited independent scientific review of the information contained in the Blanding's turtle SSA report. We sent the SSA report to seven independent peer reviewers and received four responses. The peer reviews can be found at https://www.regulations.gov at FWS–R3–ES–2026–4390. 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 four peer reviewers on the draft SSA report. We reviewed all comments we received from the peer reviewers for substantive issues and new information regarding the contents of the SSA report.

The peer reviewers generally concurred with our methods and conclusions, and provided additional information and clarifications, including on life history, population distribution, threats, additional literature to cite, and other editorial suggestions. Peer reviewer comments are addressed in version 1.1 of the SSA report, and some substantial comments are summarized here.

Comment 1: One peer reviewer asked for clarity on our statement that the presence of an immigrant turtle into a population could increase the overall fitness of individuals in that population.

Our response: We were referring to population rescue, which is when individuals immigrate into a declining population, thereby increasing the population's size, genetic diversity, and fitness of individuals (Brown and Kodric-Brown 1977, p. 445).

Comment 2: Two peer reviewers requested clarification on the maps of RPUs used. In particular, the reviewers were concerned that the Minnesota part of the range was

not accurately conveyed on the maps, especially in the northern part of the State. The reviewers suggested that we recheck our boundaries and revise the maps in that part of the range using current population data.

Our response: As requested, we produced an updated map for Minnesota, as the original map in the SSA was based on the International Union for Conservation of Nature range map and did not accurately reflect the range in Minnesota. However, we did not refine the map as closely as requested by the peer reviewers. Location data on the Blanding's turtle is highly sensitive due to the threat of collection, and we produced our maps at a coarse scale to protect those sensitive locations.

Comment 3: One peer reviewer commented on the original set of six RPUs outlined in the draft SSA report sent to reviewers, in which the Midwest was represented as one RPU. They noted the difference in the number of extant populations, the climate, the historical habitat loss, and the extent of suitable habitat in the northern portion of the Midwest as compared to the southern portion. The reviewer suggested that population resiliency might vary greatly between those two parts of the Midwest.

Our response: We received similar comments from State and technical reviewers during the SSA review process. After carefully reviewing these comments and the best available data, we split the former Midwest RPU into two RPUs (the North Central RPU and the South Central RPU), which more accurately portrays differences in climate, turtle biology, and habitat availability found in the northern and southern parts of the Midwest.

Comment 4: One peer reviewer highlighted our definition of "viability" in the SSA report. They questioned whether any species could ever meet the criteria of having: (1) a sufficient number and distribution of healthy populations to ensure the species can withstand annual demographic and environmental variation (resiliency), (2) catastrophes (redundancy), and (3) novel or extraordinary changes in its environment (representation).

Our response: Many species have adequate redundancy, resiliency, and representation such that they could withstand stochastic and catastrophic events, either through life-history traits, through wide distributions, or through high numbers of populations. For example, some rare plants have robust seed banks that allow them to persist through many years of unfavorable conditions. And many species are distributed widely enough that, should some habitat be lost, the species will still be found in other areas.

I. Proposed Listing Determination

Background

A thorough review of the taxonomy, life history, and ecology of the Blanding's turtle is presented in the SSA report (version 1.1; Service 2023, pp. 4–14).

The Blanding's turtle is a medium-sized, freshwater turtle with a bright yellow throat and chin and a long neck that can be retracted into its shell for protection. This species occurs in Nebraska and the Great Lakes region, with disjunct populations in New York and New England. The Blanding's turtle also occurs in Canada in Ontario, Québec, and Nova Scotia.

The Blanding's turtle is an omnivore, eating a wide variety of aquatic invertebrates, vertebrates, and plant matter (Compton 2007, p. 25). It requires a mosaic of aquatic habitat, which can include prairie wetlands, lakes, ponds, bogs, marshes, and vernal pools. Terrestrial habitat is used for nesting, basking, aestivation, and as migration corridors (Congdon and Keinath 2006, p. 17; Compton 2007, p. 17; Congdon et al. 2008, p. 4).

When nesting, Blanding's turtle females typically seek out habitat that is unvegetated or sparsely vegetated with a mix of gravel and sand substrate (Compton 2007, p. 13). Blanding's turtles may nest on cobble beaches along lakeshores, grasslands, rocky outcrops, naturally sandy areas, and on areas disturbed by humans (Ross and

Anderson 1990, p. 6; Standing et al. 1999, p. 1612; Congdon and Keinath 2006, p. 27; Compton 2007, p. 13; Markle and Chow-Fraser 2014, p. 221).

Blanding's turtle activity and movements are largely driven by seasonal and daily temperatures. As the ice melts in early spring (late March to mid-April), Blanding's turtles emerge from overwintering, become active, and mate (Pappas et al. 2000, p. 562; Piepgras and Lang 2000, pp. 592–593; Congdon and Keinath 2006, p. 22). During this time, individuals may also move among ephemeral wetlands to take advantage of resources. The majority of inter-wetland movements tend to be less than 500 m (547 yd), especially in areas with large, high-quality wetlands (Ross and Anderson 1990, p. 10; Compton 2007, p. 14).

From mid-April to late October, individuals have activity centers, which are areas within their home range in which they spend much of their time. Between mid-May and early July, reproductive females begin making forays to nesting sites, with some females making extensive migrations during nesting seasons (Congdon et al. 2000, p. 571; Pappas et al. 2000, p. 566; Congdon and Keinath 2006, p. 22). Nesting season lasts approximately 16–30 days, and females return to wetlands shortly after egg laying.

In September and October, Blanding's turtles typically begin to move toward overwintering sites. Overwintering is when turtles enter a state of dormancy in order to survive freezing conditions that would otherwise be lethal. Activity of both sexes decreases after arriving at overwintering sites (Ross and Anderson 1990, p. 439; Edge et al. 2009, p. 830), with individuals generally entering into winter dormancy between mid-September and mid-November when water temperatures drop to 10–13 °C (50–55 °F) (Ross and Anderson 1990, p. 8; Newton and Herman 2009, p. 304; Cann et al. 2023, p. 5).

Blanding's turtle females generally mature between 14 and 20 years of age, and males likely mature around 14 years of age (Congdon and van Loben Sels 1991, p. 242,

1993, p. 828; Congdon et al. 2001, p. 822). Females often display a strong nest-site fidelity (Congdon et al. 1983, p. 421; Standing et al. 1999, p. 1611; Markle and Chow-Fraser 2014, p. 222, 2018, p. 863) and typically produce 6–18 eggs per clutch (Pappas et al. 2000, pp. 561–562). The hatchlings emerge from their nests in mid-August to early October, with most hatchlings dispersing from the nest to wetland environments (Congdon and Keinath 2006, p. 22).

Depending on the age class, quality of the habitat, and proximity to threats, survivorship of Blanding's turtles can vary greatly. Hatchlings typically experience low survivorship after hatching, with annual rates typically as low as 33 percent or less (Congdon and van Loben Sels 1993, p. 830; Paterson et al. 2014, p. 280). Juvenile survivorship can be as low as 33–42 percent, but can also be high (Cann et al. 2023, p. 7). Similarly, nest survival among years can also be highly variable.

High survivorship has been noted among adult individuals of populations, with annual survival in a 31-year study ranging from 92 to 95 percent (Congdon et al. 1993, p. 829). However, adult survival can be significantly impacted by road mortalities, which may have a disproportionate effect on female turtles during nesting season (Reid and Peery 2014, p. 7; Reid et al. 2016b, p. 553).

Blanding's turtles have a narrow thermal range for embryo development. Below 22 ºC (71.6 °F), nest failure is complete (Gutzke and Packard 1987, p. 162); above 31 ºC (87.8 °F), hatchling success decreases (Gutzke and Packard 1987, p. 162); and sustained nest temperatures of 35–40 ºC (95–104 °F) can lead to partial or complete nest failure (Compton 2007, p. 22). Hatchling sex ratios of Blanding's turtles tend to be female biased (Congdon and Keinath 2006, p. 4), as incubation temperatures over 30 ºC (86 °F) largely produce females (Gutzke and Packard 1987, p. 162). The species also exhibits one of the lowest preferred body temperatures of any North American turtle (27.5–27.8 °C)

(81.5–82.0 °F) (Byer et al. 2020b, p. 397) and has one of the lowest thermal tolerances of any turtle species (39.5 °C) (103.1 °F) (Hutchison et al. 1966, p. 35).

Like other freshwater turtle species, Blanding's turtles may decrease their activity or aestivate to limit energy expenditure when resources are scarce or water levels are low (Anthonysamy et al. 2013, p. 329). Aestivation is most likely to occur during droughts or periods of low precipitation, especially in the summer months when temperatures are highest.

Based on genetic, phenotypic, and ecological differences, as well as geographic separation, we delineated seven different RPUs: the Great Plains, North Central, South Central, New York, New England, Central Canada, and Nova Scotia (figure 1). For information on the rationale for delineating these units, see the SSA report (Service 2023, table 2-6).

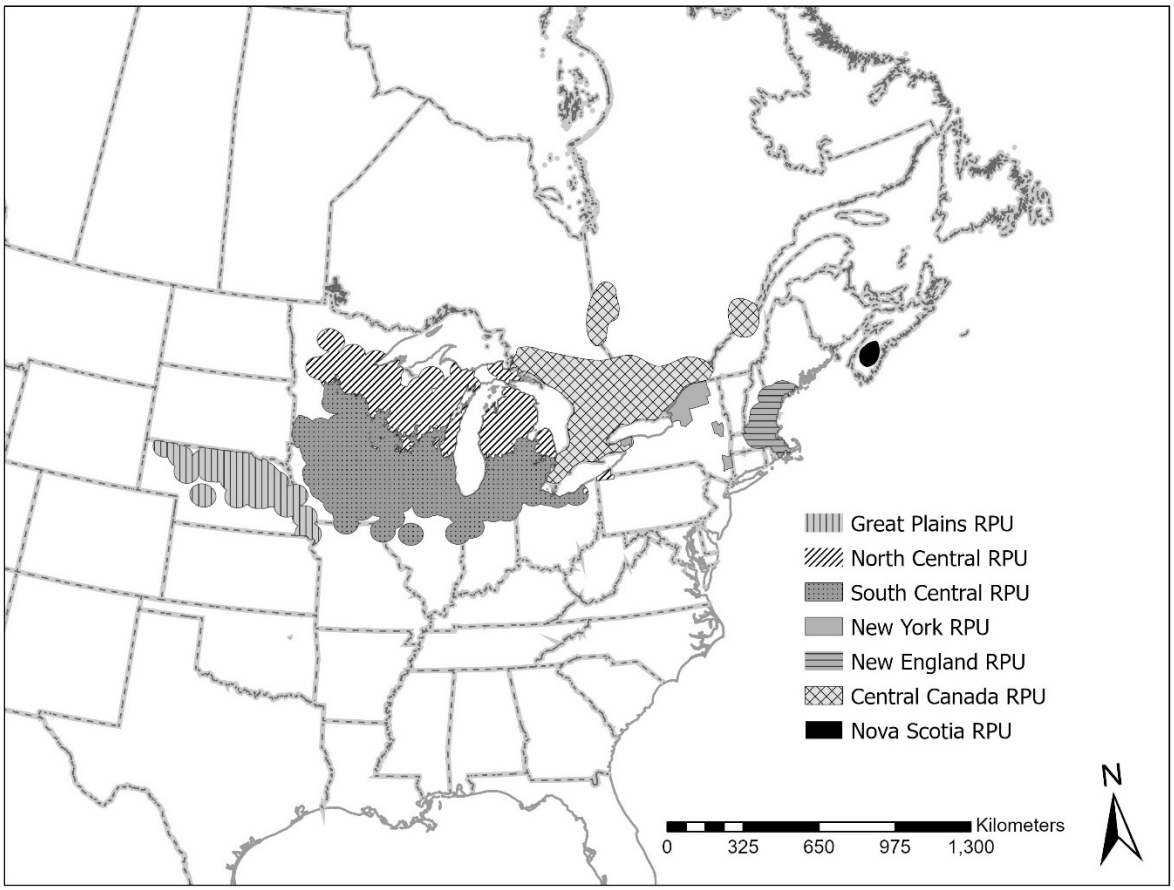


Figure 1—RPUs. This map shows the broad range of the seven RPUs considered in this analysis. It is important to note that actual occupied area represents less than 9 percent of the geographic land area depicted in the RPUs.

Regulatory and Analytical Framework

Regulatory Framework

Section 4 of the Act (16 U.S.C. 1533) and 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.

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.

The Act does not define the term "foreseeable future," which appears in the statutory definition of threatened species. Our regulations at 50 CFR 424.11(d) set forth a framework for evaluating the foreseeable future on a case-by-case basis, which is further described in the 2009 Memorandum Opinion on the foreseeable future from the Department of the Interior, Office of the Solicitor (M–37021, January 16, 2009; "M-Opinion," available online at

https://www.doi.gov/sites/doi.opengov.ibmcloud.com/files/uploads/M-37021.pdf). The foreseeable future extends as far into the future as the U.S. Fish and Wildlife Service and National Marine Fisheries Service (hereafter, the Services) can make reasonably reliable predictions about the threats to the species and the species' responses to those threats. We need not identify the foreseeable future in terms of a specific period of time. We will describe the foreseeable future on a case-by-case basis, using the best scientific and commercial data available and taking into account considerations such as the species' life-history characteristics, threat projection timeframes, and environmental variability. In other words, the foreseeable future is the period of time over which we can make reasonably reliable predictions. "Reliable" does not mean "certain"; it means sufficient to provide a reasonable degree of confidence in the prediction, in light of the conservation purposes of the Act.

Analytical Framework

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

To assess Blanding's turtle viability, we used the three conservation biology principles of resiliency, redundancy, and representation (Shaffer and Stein 2000, pp. 306–310). Briefly, resiliency is the ability of the species to withstand environmental and demographic stochasticity (for example, wet or dry, warm or cold years); redundancy is the ability of the species to withstand catastrophic events (for example, droughts, large pollution events); and representation is the ability of the species to adapt to both near-

term and long-term changes in its physical and biological environment (for example, climate conditions, pathogens). In general, species viability will increase with increases in resiliency, redundancy, and representation (Smith et al. 2018, p. 306). Using these principles, we identified the species' ecological requirements for survival and reproduction at the individual, population, and species levels, and described the beneficial and risk factors influencing the species' viability.

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

The following is a summary of the key results and conclusions from the SSA report; the full SSA report can be found at Docket No. FWS–R3–ES–2026–4390 on https://www.regulations.gov.

Summary of Biological Status and Threats

In this discussion, we review the biological condition of the species and its resources, and the threats that influence the species' current and future condition, in order to assess the species' overall viability and the risks to that viability.

Blanding's Turtle Needs

Individual Needs

The Blanding's turtle's individual-level needs, based on the life-history information outlined above, are summarized in table 1.

Table 1—Blanding's Turtle Needs at the Individual Level

Type of Requirement	Description
Complex of wetlands	Relatively permanent aquatic areas for long-term residence. Additional smaller and more temporary wetlands or streams to use for foraging and as temporary refugia when making overland movements. Inclusion of diverse vegetation that is not so dense that it prevents movement or basking. Muddy substrate in shallow areas in which adults and juveniles can bury during the winter and that does not freeze.
Terrestrial habitat	*Movement corridors*—Continuous habitat, free from barriers, that allows individuals to move among wetlands, to nesting habitat, and to areas in which individuals can aestivate. Vegetation sparse enough to allow individuals to move through it. *Nesting habitat*—Unvegetated or sparsely vegetated areas with loose, well-drained soil in which females can dig and which provides a hospitable environment for egg development.
Basking habitat	Submerged logs, rocks, or matted down vegetation onto which individuals can climb out of the water.
Diet	Aquatic invertebrates, vertebrates, and plant matter.
Temperature	Temperature less than 39.5 °C (103.1 °F). Temperature between 22–32 °C (72–90 °F) for incubation of eggs.

Population Needs

In this discussion, we describe the ecological needs of a resilient population, or what a population requires to sustain itself over time, through good and bad years. For the purpose of this document, a Blanding's turtle population that can sustain itself in the wild over time is one that is able to withstand random fluctuations in birth and death rates, stochastic events (such as drought, flooding, and storms), and normal year-to-year environmental variation (such as temperature and rainfall).

For Blanding's turtle populations to be healthy and have high resiliency, they must have: (1) a robust demography, (2) adequate habitat to support all life stages, (3) adequate genetic diversity, (4) connectivity with other populations, and (5) manageable threats.

Demographic Health—To sustain populations in the wild and have a higher ability to withstand environmental and demographic stochasticity, Blanding's turtle populations require demographic traits that support a stable (or increasing) population

growth rate. For the Blanding's turtle, key demographic rates that drive population health include adult survivorship, nest and embryo survivorship, juvenile survivorship, and the age at which females first reproduce (Congdon et al. 1993, p. 831; Heppell 1998, p. 374; Congdon et al. 2000, p. 577; King et al. 2021, pp. 119–120). Even small increases in adult mortality can have profound effects on Blanding's turtle populations (Compton 2007, p. 59).

Results of the demographic modeling we conducted for the SSA (Service 2023, p. 26, table 2-3, table 2-4, Appendix B) indicate that the minimum population size needed for a Blanding's turtle population to have a low probability of extinction within one cohort generation (37 years) (Congdon et al. 1993, p. 829), given different ages of females' first reproduction and levels of recruitment (due to nest predation), ranges from 12 to 44 breeding adults (assuming an even sex ratio) (hereafter we refer to cohort generation simply as "generation"). The minimum annual adult survival rate needed for a population to remain stable (assuming adequate suitable habitat) ranges from 92.3 to 95 percent depending on the geographic region and level of first year recruitment.

Habitat To Support Demographic Health—Healthy Blanding's turtle populations require habitat of sufficient quality and quantity to support a healthy demography as well as connectivity among different habitat elements. The quantity of habitat needed to support demographically and genetically robust populations varies based on Blanding's turtle density and distribution of resources, as evidenced by varying home range sizes (Congdon and Keinath 2006, p. 20; Spetz et al. 2021, p. 165).

Based on different home range sizes documented in a Blanding's turtle population in Wisconsin and one in Minnesota and the area encompassing all regular Blanding's turtle movements in a Minnesota wetland, we consider 100 ha (247 ac) to be the minimum amount of suitable habitat needed to support a healthy population (King 2021, p. 5, 2023, p. 8; King et al. 2021, p. 128). To be able to maintain stable and

demographically and genetically robust populations in the wild, Blanding's turtle populations also need connectivity among the different habitat elements (resident aquatic areas, peripheral aquatic areas, and terrestrial nesting areas).

Genetic Health—Healthy Blanding's turtle populations require a population size large enough to maintain existing genetic diversity and avoid increasing the frequency of maladaptive traits. Results of population viability modeling indicate that a Blanding's turtle population must have an initial population size of at least 25 to 65 adults to retain at least 95 percent of the population's existing genetic diversity over 50 years, with the number of individuals dependent on the level of environmental stochasticity and occurrence of catastrophes (King et al. 2021, p. 124). To retain at least 95 percent of existing genetic diversity over 100 years, a Blanding's turtle population must have at least 100–200 adult individuals (King et al. 2021, p. 124).

Connectivity With Other Populations—Demographically and genetically robust Blanding's turtle populations must also be connected to other populations to allow for gene flow and for recolonization in the event of local extirpation. Gene flow with other populations is important because it helps maintain genetic diversity within a population (see above for importance) and because it allows for population rescue (when individuals migrate into a declining population) (Brown and Kodric-Brown 1977, p. 445).

Frequent gene flow may require populations to be within 8–12 km (5.0–7.5 mi) of each other. For infrequent gene flow to occur, populations may need to be within 17 km (10.6 mi) of each other, given that 17 km is the maximum movement distance published for Blanding's turtles (Beaudry et al. 2008, p. 2560). Infrequent gene flow would facilitate recolonization of locally extirpated populations and population rescue of declining populations. For gene flow to occur, there must not be barriers, such as interstate highways with high volumes of traffic (unless there are culverts or underpasses

that could provide corridors for movement), or large stretches of unsuitable habitat between populations.

Species Needs

For the Blanding's turtle to maintain viability at the species level, it requires a sufficient number and distribution of healthy populations to ensure the species can withstand (1) annual demographic and environmental variation (resiliency), (2) catastrophes (redundancy), and (3) novel or extraordinary changes in its environment (representation).

Resiliency—The Blanding's turtle's ability to withstand stochastic events requires maintaining healthy populations across heterogeneous conditions. Blanding's turtle populations that are healthy (demographically, genetically, and physically robust) are better able to withstand and recover from environmental variability and stochastic perturbations. Blanding's turtle populations are better able to withstand perturbations and natural variation if they have: (1) adequate habitat, (2) demographic rates sufficient to support stable population growth rate, (3) adequate genetic diversity, and (4) a wide distribution across a diversity of environmental conditions. Additionally, maintaining natural patterns and levels of connectivity among populations is required to allow for gene flow and demographic rescue.

Redundancy—The Blanding's turtle's ability to withstand catastrophic events requires having numerous, widely distributed healthy populations relative to the spatial occurrence of catastrophic events. In addition to guarding against population extirpation, redundancy is important to protect against losses in the Blanding's turtle's adaptive capacity. Multiple, widely distributed populations within areas of unique diversity will guard against losses of adaptive capacity due to catastrophic events, such as extended drought, extreme winter events, disease, winter wetland drawdowns, poaching events, and detrimental changes in land management practices.

Representation—A species' ability to withstand ongoing and future novel changes is influenced by its capacity to adapt, referred to as adaptive capacity. To adapt to novel changes, a species must either move to new environments that are more suitable or alter its physical or behavioral traits to match the new environmental conditions (via either plasticity or genetic change). The Blanding's turtle's ability to colonize new areas and to alter traits are requirements of each of these adaptive pathways. The rate at which conditions change must be slow enough to provide time for Blanding's turtle populations to evolve new traits suited for the new conditions or to move to track suitable habitat. We also consider requirements for the Blanding's turtle to adapt to changing conditions to include maintaining numerous healthy populations in each of the seven RPUs, as well as in different ecological settings within the RPUs.

Threats

Following are summary evaluations of six threats assessed in the SSA report for the Blanding's turtle: habitat loss (Factor A), road mortality (Factor E), increased predation (Factor C), increasing temperatures and changing precipitation patterns (Factor E), unauthorized collection (Factor B), and pollution (Factor E). We also evaluate existing regulatory mechanisms (Factor D) and ongoing conservation measures. In the SSA report, we also considered effects associated with disease (Factor C) in the current and future condition assessments, but based on the best available scientific and commercial information, we concluded that this threat is having little to no impact on the Blanding's turtle's current or future condition. For full descriptions of all threats and how they impact the species, please see the SSA report (Service 2023, pp. 25–68).

Habitat Loss

As discussed in *Blanding's Turtle Needs* above, Blanding's turtles require large home ranges that include a variety of wetlands (including streams) for residence, foraging, and overwintering, with females also requiring upland terrestrial habitat for

nesting (Grgurovic and Sievert 2005, p. 204; Congdon and Keinath 2006, p. 17). As such, loss of suitable habitat, especially the extensive loss of wetlands since the 1700s (Dahl 1990, p, 6), has shaped the current distribution and viability of the Blanding's turtle (Service 2023, pp. 23–24). Any additional habitat loss and fragmentation can have substantial impacts on populations. Habitat loss affecting Blanding's turtle is caused primarily by agricultural and urban development. Habitat degradation resulting from ecological succession, invasive species, altered hydrology, and changes in water quality also negatively affect Blanding's turtle populations.

Agricultural development was responsible for significant historical losses of Blanding's turtle habitat, particularly across the Midwest. For example, between the 1780s and 1980s, 85 percent of wetland acreage was lost in Illinois, primarily for agricultural production (Dahl 1990, p. 6; King 2013, p. 25). Extensive agricultural practices in States where drainage tile is heavily used (such as northern Missouri) have negatively affected prairies and grasslands and drained many natural wetlands (Briggler and Noel 2021, p. 6; King 2023, pers. comm.). A wetland complex called the Great Black Swamp historically covered a 4,000-km² (1,544-mi²) area in the northwestern corner of Ohio (Spetz 2008, p. 2). However, that wetland complex has been drained substantially and now covers only 100 km² (38 mi²) (Herdendorf 1992, p. 549). Similarly, wetlands have been extensively drained for agricultural purposes in Indiana (Brodman et al. 2002, p. 136), and draining of wet prairies has likely also fragmented populations and reduced the Blanding's turtle's range in Iowa (Christiansen and VanDeWalle 1999, p. 13; NatureServe 2023, p. 5).

Stream channelization from agricultural development has also affected the availability of habitat, since channelization results in loss of wetlands and stream pools and meanders that are used by Blanding's turtles (Christiansen and VanDeWalle 1999, p. 48). Loss of wetland habitat is particularly impactful because it affects all stages of the

life cycle, increasing adult mortality and reducing hatchling recruitment (Congdon and Keinath 2006, p. 3). Wetland loss and fragmentation can have greater consequences to juvenile Blanding's turtles because they occupy a narrower range of habitat types than adults, and these habitats are important for maintaining recruitment (Congdon and Keinath 2006, p. 17).

Although widespread conversion to agricultural land uses has generally negatively affected Blanding's turtle, the species does make use of some agricultural habitat. Cranberry bogs are used by the species in States such as Wisconsin (Byer 2023, pers. comm.). Female Blanding's turtles have been found to preferentially select bare crop fields for nesting over naturally occurring nest sites (Freedberg et al. 2011, p. 1160; Mui et al. 2016, p. 11). However, when agricultural areas are used, they do not always provide suitable conditions. Bare agricultural fields can subsequently become shaded by crops and can lead to reduced nesting success and skewed sex ratios (Freedberg et al. 2011, p. 1160; Mui et al. 2016, p. 11; Spetz et al. 2021, p. 170). In addition, Blanding's turtle eggs deposited in agricultural fields can fail to develop or produce hatchlings with kinked tails, lethargy, partial paralysis, incomplete development, or malformations of the carapace, presumably due to improper temperatures for embryo development (Spetz 2008, pp. 74–79). Embryos developing in agricultural fields may also be impacted by pesticides, although the magnitude of this threat is uncertain (MWPARC 2010, p. 18). Hatchlings in row crop fields have been found to disperse by following rows instead of following natural dispersal patterns, which may impair their ability to locate suitable overwintering habitat (Pappas et al. 2013, p. 394; Congdon et al. 2015, p. 543; Mui et al. 2016, p. 13). Flooding agricultural (and other upland) fields for waterfowl hunting may also adversely impact hatchling emergence (MWPARC 2010, p. 20). Furthermore, females that move through agricultural fields on their way to nesting locations have been

found crushed by tractor wheels and mowers in New York and two counties in Illinois (Compton 2007, p. 67; King 2023, pers. comm.).

Urban development may also affect Blanding's turtle. Blanding's turtle populations located near or within urban areas are at higher risk from mortality due to increased traffic and road density, direct loss of wetland and upland habitat, habitat fragmentation, and increases in nest predation (Compton 2007, p. 53). In the northeastern United States, the species overlaps with some of the highest human population densities, and much of the remaining occupied habitat is in rural areas where neighboring metropolitan areas are rapidly advancing (Compton 2007, pp. 50–52). In Illinois, increasing human populations and expanding urban development also continue to reduce Blanding's turtle habitat, primarily in the Chicago area but also in rural areas (MWPARC 2010, p. 12; Henning and Hinz 2016, p. 6). Urban development around large cities in Minnesota has also reduced the amount of Blanding's turtle habitat and fragmented the remaining habitat (Dorff 1995, p 15).

Blanding's turtles born within residential areas are associated with higher hatchling mortality rates (Jones and Sievert 2012, p. 91). Female Blanding's turtles may be attracted to lawns and gardens for nesting, but fragmented habitat in suburban landscapes results in increased predation and higher road mortality (Jones and Sievert 2012, p. 92). In some urban areas, the habitat fragmentation from development has resulted in Blanding's turtles living in small, isolated wetland complexes with small populations of adults (King 2013, p. 31).

Both habitat succession (transition to shrubs or trees) and habitat degradation are also threats to Blanding's turtle populations. Forest succession and invasive species can increase vegetation cover in wetlands, reducing basking opportunities and incubation temperatures and potentially preventing hatchling emergence if vegetation is too dense (Henning and Hinz 2016, p. 7). This situation can also create a cooler incubation

environment for the eggs, resulting in predominantly male hatchlings (NatureServe 2023, p. 5). Replacement of natural plant communities with dense cattail or bullrushes may also be affecting the species (Christiansen and VanDeWalle 1999, p. 13).

Some Blanding's turtle populations are being impacted by land management practices, such as when wetlands are drawn down to remove undesired fish, vegetation, or both. High levels of mortality have occurred from freezing when the substrate was exposed in late winter, as well as by poisoning from chemical treatments sprayed on the exposed lake bottom in the early spring (NatureServe 2023, p. 5). Wetland drawdowns also have resulted in high levels of mortality from predation and road mortality when Blanding's turtles emigrate to other sites (Hall and Cuthbert 2000, pp. 645–647). In Minnesota, additional land management practices affecting Blanding's turtles habitat include prescribed burning in overwintering wetlands, chemical application, haying, and tilling (MWPARC 2010, p. 18). Even where wetlands remain, the quantity and quality of water flowing into and out of the wetlands can be affected by agriculture, transportation infrastructure, urbanization, and stormwater management (Henning and Hinz 2016, p. 7).

Loss of habitat can also result in other indirect threats to Blanding's turtles. A mass mortality event that occurred in southcentral Ontario appeared to be influenced by habitat loss associated with drought conditions (COSEWIC 2016, p. 23). The loss of 53 Blanding's turtles was likely caused by increased predator access during low water conditions and loss of coastal wetlands (Gasbarrini et al. 2021, p. 477). Because even small increases in adult mortality can have profound effects on Blanding's turtle populations (Compton 2007, p. 59), mass mortality events can have catastrophic effects.

Overall, a large number of Blanding's turtle populations throughout the species' range have been impacted by agriculture, urban development, or habitat fragmentation. These threats can affect Blanding's turtle habitat needs such as large wetland complexes, suitable nesting habitat, and movement corridors. We anticipate these threats will

increase in magnitude into the future. These threats are also occurring in Canada; however, we do not have information on the magnitude of the threat in those populations.

Road Mortality

Road mortality is one of the largest threats to Blanding's turtles, impacting populations throughout the range. Most populations of Blanding's turtles in the Midwest are at risk from road mortality (MWPARC 2010, p. 21). In Minnesota, road mortality is a major threat in all populations due to the abundance of roads and increased traffic volume as roads continue to get wider and vehicles move faster, particularly near metropolitan areas (MWPARC 2010, p. 21). Similarly, road mortality has been identified as one of the most important threats to Blanding's turtle populations in the northeastern United States (Compton 2007, p. 56). In two studies in New England, researchers documented 35–46 percent of turtles crossing at least one road over the study period (Compton 2007, p. 57; Beaudry et al. 2006, pp. 12–13). In Nebraska, up to 15 percent of Blanding's turtle populations may be affected by increased mortality due to attempted road crossings (MWPARC 2010, p. 21). In the 1990s and early 2000s, road mortality of Blanding's turtles was substantial and appeared to be increasing along a major highway in the northwestern portion of Nebraska, with 175 turtles (of all species) documented dead on the road during 2 seasons (Lang 2004, p. 2, 31). In Ontario, road mortality is also occurring at a high rate and is anticipated to cause future declines (COSEWIC 2016, appendix 3).

The magnitude of effects of road mortality on a population depends on what life stage is impacted. As discussed in *Blanding's Turtle Needs* above, small increases in adult mortality can have profound effects on Blanding's turtle populations (Compton 2007, p. 59). Rates of road mortality are usually higher for females due to movements to upland nesting sites (Beaudry et al. 2010, p. 157); this occurrence can lead to male-skewed sex ratios in populations (Ruane et al. 2008, p. 775; Reid and Peery 2014, p. 6).

Female adult mortality rates vary 3.5–31 percent across the species' range and are largely driven and heavily influenced by road mortality (King et al. 2021, p. 117). A long-term study at a site in Nebraska with a road near the core wetlands had extremely low estimated annual survival rates for females (59 percent) and males (69 percent) (Ruane et al. 2008, p. 771).

Road mortality rates are less well characterized for hatchling and juvenile turtles. Hatchlings have been recorded moving as much as 188 m (617 ft) in a single day (Spetz et al. 2021, p. 171) and can be killed on roads while enroute to water from upland nesting sites (Jones and Sievert 2012, p. 90; Spetz et al. 2021, p. 171). In addition, 29 percent of hatchlings counted during a 2021 road census near a large Blanding's turtle population were killed by automobiles (Pappas 2023, pers. comm.). Juveniles are also vulnerable to road mortality and can represent a greater fraction of the roadkill at some sites (Lang 2004, p. 31).

In addition to direct mortality, major roads with more than 1,000 cars per day also isolate Blanding's turtle populations by limiting dispersal (Compton 2007, p. 38). Although occasional immigration of individuals into new populations may result in increased genetic diversity, this occurrence likely does not contribute demographically, and many Midwest and Northeast populations remain small and isolated (Compton 2007, p. 38).

Conservation measures and fencing have been implemented in some limited locations in an attempt to reduce the magnitude of road mortality on populations. These measures include drift fencing, ecopassages (culverts), modification of curbs, and signage and educational programs. The most common practice includes implementation of a fence system to provide a barrier from the roadway and also guide turtles to a safe passage area such as a culvert (Walston and LaGory 2010, p. 8). However, the effectiveness of these measures is uncertain. After fencing was installed and connected to

existing culverts at a study site in Nebraska, road mortality of turtles (of all species) initially decreased approximately 66 percent in the fenced road sections (Lang 2004, p. 21). However, a subsequent study comparing turtle observations (both dead and alive) on fenced versus unfenced highway segments found 33 percent fewer turtles on the fenced segments; however, this difference was not statistically significant (Huijser et al. 2017, p. 15). Another study to determine the effectiveness of roadway mortality mitigation measures (ecopassages and exclusion fences) was conducted in 2012–2013 and included in a roadway expansion project in Ontario, Canada (Baxter-Gilbert 2015, entire). Neither abundance of reptiles on the road nor mortality of individuals were reduced during the study, indicating that the mitigation measures were ineffective (Baxter-Gilbert 2015, p. 8). In both studies, researchers concluded that modifications to mitigation measure designs could have increased effectiveness of the conservation measures (Baxter-Gilbert 2015, p. 10; Huijser et al. 2017, p. 33).

Overall, road mortality is one of the primary threats impacting Blanding's turtles. Aside from direct mortality to all life stages, road mortality can affect movement of Blanding's turtles and isolate or further fragment existing populations. We expect this threat will continue into the future and potentially increase as additional roads are constructed.

Increased Predation

Predation is a natural part of the Blanding's turtle's life history, including naturally high predation rates. Predation risk varies dramatically among Blanding's turtle life stages and size classes. However, chronic increases in nest and hatchling mortality can affect population resiliency (Compton 2007, p. 55). In urban areas, nest predation is particularly high due to rapid increases in mesopredator populations. Mesopredators are predator animals that occupy a mid-ranking trophic level in a food web and include species such as raccoons (*Procyon lotor*), skunks (*Mephitis mephitis*), opossums

(*Didelphis virginiana*), badgers (*Taxidea taxus*), foxes (*Vulpes vulpes* and *Urocyon cinereoargenteus*), mink (*Neovison vison*), and coyotes (*Canis latrans*). Raccoons have exhibited especially rapid increases in population density in urban environments and can cause nearly 100 percent mortality of turtle nests (Congdon et al. 2000, p. 572; U.S. Department of Agriculture 2020, p. 8). Predation by mesopredators on Blanding's turtle eggs in natural and agricultural landscapes can also be significant (Browne and Hecnar 2007, p. 427; King 2013, p. 32).

Turtle nests are particularly vulnerable to disturbance and predation by mesopredators, which may dig into nests and consume the eggs. Studies have found that nests are at highest risk of predation in the first 24 to 48 hours after nest construction (Congdon et al. 2000, p. 572; Congdon and Keinath 2006, p. 26; Compton 2007, p. 22; Byer et al. 2019, p. 47), but the risk levels out and remains relatively constant after day 5 (Congdon et al. 2000, p. 572). Since Blanding's turtles lay all their eggs in a single nest, predators may consume entire nests in a single predation event (King 2013, p. 32). Furthermore, as nesting habitat decreases, nests become more spatially concentrated (COSEWIC 2016, p. 18). Consequently, predators can more easily find nests, and population-level nest predation rates can markedly increase (MWPARC 2010, p. 17).

The risk for adult Blanding's turtles being seriously injured or killed by predators is low; however, there have been exceptions. Fifty-three Blanding's turtles in Ontario were depredated in a mass mortality event in the summer of 2012, likely caused by otters, resulting in the loss of half the population (Gasbarrini et al. 2021, pp. 471, 475, 477).

Alterations to natural habitat can increase the frequency and severity of predation events. Habitat loss can lead to higher concentrations of Blanding's turtles, making populations more susceptible to mass mortality events if depredation occurs (Gasbarrini et al. 2021, p. 476). Lower water levels may have made coastal marsh areas unsuitable and concentrated overwintering turtles in areas where they were more susceptible to otter

predation (Gasbarrini et al. 2021, p. 476). Additionally, wetland drawdowns can push Blanding's turtles into upland habitat, making them more susceptible to predation (Hall 2023, pers. comm.).

Conservation efforts such as nest protection and headstarting programs (the collection of Blanding's turtle eggs from natural nesting sites to incubate, hatch, and grow turtles for reintroduction into suitable habitats) have shown promising results for increasing juvenile survival. Although nest predation and hatchling mortality do not impact demographic rates as severely as adult and juvenile mortality (Compton 2007, p. 55), when recruitment is reduced, other key factors like environmental stochasticity and road mortality can have more pronounced impacts on demographics and resiliency.

Overall, increased predation is a substantial threat that affects Blanding's turtle rangewide and has the potential to strongly decrease resiliency of multiple populations. We expect this threat will continue to occur and potentially increase into the future. The magnitude of predation is unknown in Canada; however, predation is likely also occurring there above natural levels.

Increasing Temperatures and Changing Precipitation Patterns

As an ectotherm (an animal whose regulation of body temperature depends on external sources), the Blanding's turtle has a niche that is strongly controlled by climate (Rödder et al. 2013. p. 4) and inhabits a narrow latitudinal range (Ernst et al. 1994, p. 242; Compton 2007, p. 67). As discussed above in **Background**, the Blanding's turtle has one of the lowest thermal tolerances of any turtle species (39.5 °C) (103.1 °F) (Hutchison et al. 1966, p. 35), making it particularly sensitive to increasing temperatures. Under future projections in the range of the Blanding's turtle, temperatures are forecast to increase year-round and throughout the range of the species (Lyons et al. 2023, p. 41). Precipitation is also projected to change in the future, although the amount and timing vary depending on season and location within the range (Lyons et al. 2023, p. 41).

Impacts to Blanding's turtles from the effects of increasing temperatures and changing precipitation patterns include projected changes in cool and warm seasons.

In regard to projected cool season changes, winter temperatures (December–February) are projected to increase across the range of the Blanding's turtle with greater increases predicted in the north near the Great Lakes (Lyons et al. 2023, p. 9). Annual cool season precipitation (October–March) in general is projected to increase; however, some models project cool season precipitation will decline to levels less than were seen during 1971–2000 (Lyons et al. 2023, p. 9).

Winter precipitation is important for maintaining overwintering habitats for Blanding's turtles. Projected increases in precipitation could increase the amount of wetland habitat and its connectivity but could also deepen some historical overwintering wetlands, making them unsuitable (Lyons et al. 2023, p. 9). However, decreases in precipitation could lead to loss of habitat. Projected warmer temperatures could stimulate premature emergence and movement of overwintering individuals, which increases energy demands during this critical period of the annual cycle and puts individuals at risk of exposure if temperatures rapidly plummet (Newton and Herman 2009, pp. 299–300). With rising temperatures, extreme cold events are projected to occur less often, which may lessen the potential for mortality events (Lyons et al. 2023, p. 24). High levels of mortality have occurred from freezing when the substrate was exposed in late winter (NatureServe 2023, p. 5; Hall and Cuthbert 2000, pp. 645–647).

Blanding's turtle hatchlings are also at risk from projected changes in cold season environmental variables. Hatchlings utilize different overwintering habitat than adults and juveniles and will use nest cavities or terrestrial areas for hibernation (Lyons et al. 2023, p. 9). Although hatchlings have been found to tolerate winter temperatures of -2 °C (28.4 °F) for up to 48 hours (Packard et al. 1999, p. 370), hatchlings overwintering on land rely on snowpack for insulation; therefore, decreases in snowpack can increase cold

exposure and thermal stress (Nagle et al. 2000, p. 230; Congdon and Keinath 2006, p. 14).

In regard to projected warm season changes, although there is variability among models with some projecting increases in precipitation, most show future trends of decreasing precipitation during the warm season (April–September), especially in the central and western portion of the Blanding's turtle range (Lyons et al. 2023, p. 24). Temperature is projected to increase across the range (Lyons et al. 2023, p. 29).

Females dispersing to nesting sites utilize small waterbodies for feeding and sheltering (Lyons et al. 2023, p. 24). Although cold season increases in precipitation may lead to additional spring habitat in some places, the trend toward less precipitation and higher temperatures may result in a loss of habitat and increased potential for mortality of females (Beaudry et al. 2009, p. 643; Lyons et al. 2023, p. 24).

As previously discussed, Blanding's turtle embryos have a narrow thermal range for embryo development. It is unclear how much effect projected increases in temperature will have on Blanding's turtle nestlings, as several factors influence whether nests are exposed to increased temperatures (e.g., timing of nesting, vegetation near or over nesting sites, and the type of substrate the nest is in) (Lyons et al. 2023, p. 30). Many freshwater turtle species are known to adjust nesting behaviors in reaction to increased temperatures (Roberts et al. 2023, pp. 2649–2650). However, given that Blanding's turtles tend to choose warmer nesting locations with open canopy or on south-facing slopes (Congdon et al. 2000, p. 571; Ruane et al. 2008, p. 775), changes in nesting behavior may not offset projected increases in temperature, especially across the southern part of the range (Lyons et al. 2023, p. 30).

Changes in precipitation may also impact nesting success. Local heavy precipitation events could lead to flooding of nest sites or erosion of sandy soils, which may cause nest failure (Lyons et al. 2023, p. 30). Conversely, drier weather may make

nest construction more difficult and lead to desiccation of eggs and hatchlings (Lyons et al. 2023, p. 33).

During the summer, Blanding's turtles tend to aestivate when temperatures are too high, which limits feeding, reproduction, and overall fitness (COSEWIC 2016, p. 24). Given the projected increases in temperatures, especially in the southern part of the range, Blanding's turtles are more likely to spend more time aestivating, which may be very detrimental if they forgo foraging for too long (Lyons et al. 2023, p. 40). Also, if warm season trends lead to more extreme drought cycles spring through fall, there may be more extreme losses and degradation of wetland hydrology (King 2013, p. 37; Lyons et al 2023, p. 41). Consequently, there may also be an increased risk from road mortality as Blanding's turtles search for suitable wetland habitat (King 2013, p. 37).

The life history of the species may confound its ability to adapt to changing climatic conditions. Blanding's turtles exhibit strong site fidelity with individuals returning to overwintering sites (Walston et al. 2015, pp. 289–290) and females utilizing nesting habitat in consecutive years (Congdon et al. 1983, p. 421; Standing et al. 1999, p. 1611). Hatchlings also exhibit low dispersal (Reid et al. 2016a, p. 612). Although the Blanding's turtle exhibits the ability to increase movement when seeking wetland habitat (Hall and Cuthbert 2000, p. 332), changes in climatic conditions are likely to outpace its ability to shift to new habitats.

Our habitat suitability maps indicate that the Blanding's turtle faces a high potential for vulnerability to the effects of increasing temperatures and changing precipitation patterns, especially on its southern range boundary. Significant reduction of populations along the southern range limit is of particular concern for adaptive capacity because populations along the southern range limit typically are disproportionately important for the long-term conservation of genetic diversity, phylogenetic history, and evolutionary potential of the species (Hampe and Petit 2005, p. 461). While the species

cannot evolve over the timeframes assessed within the SSA report and this proposed rule, these populations may house unique genetic, phenotypic, or behavioral adaptations to warmer and drier conditions that could be important in terms of conservation and long-term evolutionary potential.

Potential responses of the Blanding's turtle to increasing temperatures and changing precipitation patterns include tracking, or following, its climate niche or adapting to new climate conditions, evolutionarily or behaviorally. However, multiple lines of evidence indicate that Blanding's turtles are more likely to respond in the future by attempting to disperse than by evolving to changing climate conditions. First, though increasing temperatures and changing precipitation patterns are projected to have large implications for Blanding's turtle habitat suitability by the end of the century (and sooner), evolutionary response is unlikely over this timeframe, as it represents only three generations for Blanding's turtles. Second, the capability of the Blanding's turtle to adapt to changing ecological conditions is likely limited by its low genetic diversity (Guinto et al. 2023, p. 1). Third, the Blanding's turtle moved north and east roughly 15,000 years ago after the Wisconsin glaciation to track its climate niche (Sethuraman et al. 2014, p. 61), indicating that niche tracking (i.e., dispersal) rather than niche evolution (i.e., evolving in place) has been the species' dominant process in response to changing climate, historically. Niche conservativism has been documented in the Emydinae subfamily of North American freshwater turtles (Stephens and Wiens 2009, p. 1), which means that species in this family, including the Blanding's turtle, have historically tended to track their climate niche rather than evolve to changing conditions. We, therefore, conclude that the Blanding's turtle is more likely to respond to the effects of increasing temperatures and changing precipitation patterns in the future by attempting to disperse rather than by adaptively evolving to changing climate conditions.

However, the Blanding's turtle's ability to disperse northward to track its shifting climate niche remains unclear. While the Blanding's turtle is certainly one of the more mobile freshwater turtle species, it is likely limited in its physical ability to track the shifting climate niche for several reasons. For one, the species is unlikely to be able to shift its range northward in many parts of the range due to poor landscape connectivity. In addition, projected loss of climatically suitable habitat is expected to occur at a rate that is generally much faster than the species could physically disperse via range shifts, even if there was perfect connectivity (Hamilton et al. 2018, p. 2). Thus, while some northward shift could occur, a significant degree of range shift is unlikely in the future. The species is also unlikely to move to higher altitudes to track shifting climate space (Byer et al. 2020a, p. 1224). Additionally, the Great Lakes also provide a barrier to northward dispersal in some parts of the range.

Several studies have investigated the species' ability to adapt in place to changing climate conditions via behavioral adjustments. As a dietary generalist, the Blanding's turtle should be able to adjust to shifts in available food sources. However, the species has multiple traits that limit its potential to behaviorally adapt to changing conditions, including a high degree of habitat specialization, narrow thermal tolerance, narrow climatic niche breadth, high site fidelity, and climatically controlled seasonal phenology. Furthermore, while plasticity in nest site choice is a possible adaptation, heritability of nest site choice is low in other, related freshwater turtle species, suggesting that microevolution of nest site choice to accommodate the rapidly increasing temperatures is implausible (Refsnider and Janzen 2016, p. 64). Turtles can sometimes cool their nests by digging them deeper; however, the degree of warming projected under future anthropogenic change is expected to be high enough through much of the Blanding's turtle's range such that it will likely not be able to fully offset temperature increases through this strategy (Reid and Peery 2014, p. 10).

In addition, the effects of increasing temperatures and changing precipitation patterns may exacerbate other threats to the species. Models are also forecasting increases in development in the Northeast (Ross and Johnson 2018, p. 21). Where increased development overlaps with Blanding's turtle populations, direct loss of wetland and upland habitat, increases in habitat fragmentation, road mortality, and predation of adults, juveniles, and nests are likely (Compton 2007, p. 53).

Overall, increasing temperatures and changing precipitation patterns are projected to change across the range of the Blanding's turtle, though the magnitude of this threat into the future is difficult to quantify due to the complexity of projected future changes. Given the species' physiological tolerances and the narrow latitudinal range it inhabits, the species may not be able to quickly adapt to changing climatic conditions. Projected increases in temperature, especially in the southern part of the range, may result in extreme temperature events approaching or exceeding the critical thermal maximum for the species (Lyons et al. 2023, p. 33). There are few regulatory mechanisms or conservation measures currently ameliorating the impacts of increasing temperatures and changing precipitation patterns.

Unauthorized Collection

Like many freshwater turtles, Blanding's turtle populations in the United States are at risk of unauthorized collection. A large population in southeastern Minnesota has declined from an estimated 2,500–4,600 adults to an estimated 1,000–2,760 adults (40–60 percent decline) over the last 15–20 years due to illegal collection and road mortality (Pappas 2023, pers. comm.). Land managers and local landowners have witnessed poaching activity during the nesting and hatchling seasons on a road bounding this population (Pappas 2023, pers. comm.). A population in northeastern Indiana has experienced heavy illegal collection with several people prosecuted by the Indiana Department of Natural Resources law enforcement (Kingsbury 2023, pers. comm.).

Motorists have been observed collecting gravid females on roads during nesting migrations (Congdon and Keinath 2006, p. 30). Collection for the pet trade has also been documented in Ohio (MWPARC 2010, p. 12). Besides these specific instances, most other States within the Blanding's turtle range consider unauthorized collection a threat to the species.

Collection for the pet, food, and traditional medicine trades in Canada and abroad is one of the main threats to Blanding's turtle populations in Canada (COSEWIC 2016, p. 39). Blanding's turtles are regularly being targeted for black market trafficking within and outside of Canada (COSEWIC 2016, p. 39) with the Canada Border Services Agency continuing to encounter attempts to smuggle Blanding's turtles into and out of the country (CITES 2013, p. 6). Beyond the pet trade, there is evidence that Blanding's turtles are also being harvested in Ontario for the food industry (CITES 2013, p. 6).

Individuals dealing in illegal trade of Blanding's turtles are being prosecuted through State and Federal laws. In 2010, the New York State Department of Environmental Conservation–Division of Law Enforcement charged 30 individuals and companies with felonies and misdemeanors for illegal commercialization of wildlife during "Operation Shellshock" (CITES 2013, p. 7). In 2005, an Ohio commercial reptile dealer pled guilty to illegally buying, selling, and transporting 53 Blanding's turtles (CITES 2013, p. 7).

The exact magnitude of the threat of collection to Blanding's turtles is unknown. Protection of location data by State agencies and prosecution of collectors has decreased the magnitude of impacts. However, the threat of collection is expected to remain and may increase as the species becomes rarer into the future.

Pollution

Given the overlap of occupied Blanding's turtle habitat with agricultural, urban, and suburban landscapes, Blanding's turtles are likely exposed to many types of chemical

pollutants. Studies have shown that turtle species react to contaminants in the environment with a decreased immune response, indicating higher rates of infectious diseases in populations exposed to pollution (Polo-Cavia et al. 2010, p. 256).

Although we found no studies evaluating impacts from chemical exposure to Blanding's turtles specifically, studies of other turtle species may be informative. The common snapping turtle is known to be a bioindicator of contamination (Pagano et al. 1999, p. 950; Bell et al. 2006, p. 458). High amounts of alkanes and total PAHs were measured in female common snapping turtles where they co-occurred at a Blanding's turtle population in Pennsylvania (Bell et al. 2006, p. 459). Lipophilic contaminants (those able to combine with or dissolve in lipids or fats), such as PCBs, PAHs, and pesticides, can be passed from female turtles to embryos (Pagano et al. 1999, p. 959; Bell et al. 2006, p. 959). PCBs are organochlorine pesticides and dioxins proven to accumulate in turtles (Overman and Krajicek 1995, pp. 689–695; De Solla et al. 2004, entire; Bell et al. 2006, pp. 457–465; Henning and Hinz 2016, p. 8). Embryo and hatchling deformities range from minor (bent, short, or curled tails) to more severe moderate or lethal deformities involving the spine, organs, or facial structure (Bell et al. 2006, p. 459).

There are some instances of chemical contaminants impacting Blanding's turtle populations. Mentor Marsh, a wetland near the suburbs of Cleveland, experienced an intrusion of sodium chloride from salt mining tailings in 1959, which caused a die-off of native vegetation and a proliferation of invasive *Phragmites australis*; overall, the combination of these impacts was so severe that Blanding's turtles no longer appear to be present at the site (Matson et al. 2017 p. 2). High levels of Blanding's turtle mortality have also occurred by poisoning from chemicals sprayed on an exposed lake bottom in Illinois (NatureServe 2023, p. 5).

Light and sound pollution are also of concern for Blanding's turtles as artificial light may interfere with turtle orientation and sound pollution may inhibit hatchling movements (Magyar 2009, p. 10; Henning and Hinz 2016, p. 8).

Though Blanding's turtles are likely exposed to many types of chemical and light pollutants across their range, the magnitude of the impact is difficult to measure. Some mass mortality events have been documented, but overall, the effect to the species is unknown.

Conservation Efforts and Regulatory Mechanisms

Several regulatory mechanisms reduce threats to the Blanding's turtle. The Blanding's turtle was added to Appendix II of CITES on June 12, 2013 (CITES 2013, p. 4). Appendix II includes all species that are not necessarily threatened with extinction now but may become so unless trade in specimens of such species is subject to strict regulation in order to avoid utilization incompatible with their survival. These species are controlled by export permits, which are granted only if trade will not be detrimental to the species' survival, and if specimens were legally acquired. Monitoring trade through CITES and the issuance of permits helps to monitor exports and decrease illegal trade of Blanding's turtles across international borders.

The Blanding's turtle is protected under State endangered species laws in most States within the range (Illinois, Indiana, Iowa, Maine, Massachusetts, Minnesota, Missouri, New Hampshire, New York, and Ohio) and has special status in all other States where extant populations occur. Where State listed, State endangered species laws provide protections prohibiting take and may protect habitat for the Blanding's turtle. However, specific regulatory protections differ from State to State throughout the range of the species (Service 2023, table 3-3).

In addition to State regulations, the Blanding's turtle in the United States is also protected by the Lacey Act (16 U.S.C. 3371–3378), which prohibits interstate

transportation and sale of fish, wildlife, or plant species that were collected in violation of State law or regulation. Specifically, it is unlawful for any person to import, export, transport, sell, receive, acquire, or purchase any fish or wildlife or plant taken, possessed, transported, or sold in violation of any law, treaty, or regulation of the United States or in violation of any Indian Tribal law. The law applies to the Blanding's turtle from wild populations, whether individual turtles are alive or dead, as well as from captive-bred populations if parent stock were illegally collected.

In Canada, the Blanding's turtle is listed at the national level as endangered under the Federal Species at Risk Act (S.C. 2002, p. 77). Prohibitions under the Species at Risk Act are similar to those of the United States' Endangered Species Act, with killing, harming, harassing, capturing, possessing, collecting, and buying, among other actions, prohibited (S.C. 2002, p. 19). In addition, the Species at Risk Act prohibits damaging or destroying the residence of one or more individuals of a species listed under the act (S.C. 2002, p. 19).

Blanding's turtle populations occur on protected land across the range (Service 2023, table 3-4). The largest population of Blanding's turtle, both in geographic size and population numbers, is protected and occurs in the Great Plains RPU within the boundary of a national wildlife refuge (Congdon et al. 2008, p. 015.7). Although most of the population is on protected land, road mortality within the refuge is a concern, but fences have been erected to control movement and have been successful at reducing impacts (Congdon et al. 2008, p. 015.7).

Conservation planning is occurring across the range of the Blanding's turtle and includes several notable examples. A comprehensive review of the status of the Blanding's turtle in the Northeast was conducted by Compton (2007, entire). Since 2003, the Northeast Blanding's Turtle Working Group (NEBTWG) has worked to conserve the Blanding's turtle in Maine, New Hampshire, Massachusetts, New York, and

Pennsylvania and collaborated on a comprehensive regional status assessment (Willey et al. 2021, p. 1). In 2011, the NEBTWG along with many State, Federal, and nongovernmental organization partners began a planning process to develop a standardized effort to monitor Blanding's turtle populations in New England (Willey at al. 2021, p. 3). The group also developed site-specific management plans for 36 of the highest priority populations (Willey at al. 2021, p. 3). The Revised Conservation Plan was published in 2021 (Willey et al. 2021, entire).

With funding through a cooperative State Wildlife Grant (SWG), the Illinois Department of Natural Resources is developing a Blanding's turtle recovery plan, which will include recovery criteria, management actions, needed research, and a State Species Status Assessment. Ohio and Michigan are also drafting a Blanding's turtle conservation plan for the Lake Erie Watershed as part of a SWG.

Conservation measures, such as nest protection and headstarting, are occurring across the species' range. Nest protection projects designed to exclude mesopredators from sensitive nesting areas, including placement of wire caging around individual nests and electric fencing around known nesting areas, have resulted in improved turtle nesting success (King 2013, p. 32). Similar projects have been successful in increasing juvenile survival rates in two large populations in Minnesota and other places across the range (Henning-Randa 2023, pers. comm.). Raccoon management has also been shown to drastically increase hatchling success (King 2013, p. 32). While nest protection efforts are occurring at some locations, the extent to which they are occurring rangewide is unclear.

Headstarting offers a potential avenue for bolstering Blanding's turtle populations in the wild, although the results from these programs have been mixed and their long-term success is unknown. Headstarting involves collecting Blanding's turtle eggs from natural nesting sites and incubating them in a controlled environment until hatching.

Once the hatchlings emerge, they are provided with optimal conditions for growth and development before being reintroduced into suitable habitats.

Headstarting programs are challenging and expensive, and measuring success is complicated due to the difficulties in marking hatchlings and the effort involved in monitoring them after release and into the future (King 2013, p. 61; Thompson et al. 2020, p. 65). In addition, headstarting is most useful in populations with high predation of hatchlings and juveniles and is likely to be only minimally successful if threats to adults are not ameliorated (Compton 2007 p. 80; Thompson et al. 2020, p. 64). Blanding's turtle headstarting programs have occurred or are ongoing in Iowa, Massachusetts, Michigan, Ohio, Wisconsin, Nova Scotia, Ontario, and Illinois (King 2013, p. 59; Hazelton 2023, pers. comm.; Wijewardena et al. 2023, entire). Some programs have shown success in increasing population numbers or survival rates (King 2013, p. 60; Thompson et al. 2020, pp. 61, 64). Other programs have been much less successful (VanDeWalle and Otten 2022, p. 667).

For populations where headstarting is the only conservation measure being used, it is unlikely that declining populations of Blanding's turtle will become self-sustaining unless the causes of decline are ameliorated (Dodd and Siegel 1991, p. 345). In addition, for long-lived species such as the Blanding's turtle, implementing monitoring on a long-term scale that can show success is very difficult. Given the complexity of headstarting programs and the limited positive effect for populations that continue to face challenges from road mortality, predation, and loss of habitat, the conservation benefits of these programs to the species in the long term are unclear.

Cumulative Effects

By using the SSA framework to guide our analysis of the scientific information documented in the SSA report, we have analyzed the cumulative effects of identified threats and conservation actions on the species. To assess the current and future condition

of the species, we evaluate the effects of all the relevant factors that may be influencing the species, including threats and conservation efforts. Because the SSA framework considers not just the presence of the factors, but to what degree they collectively influence risk to the entire species, our assessment integrates the cumulative effects of the factors and replaces a standalone cumulative-effects analysis.

Methodology for Current and Future Conditions Analysis

In this section, we present a concise summary of our methods and results for delineating AUs and RPUs, evaluating the change from historical condition, assessing the resiliency of AUs, assessing connectivity between units, and projecting our analysis into the foreseeable future. For much greater detail on all methodology and results, please see the SSA report for the Blanding's turtle (Service 2023, pp. 48–124; appendices B–E).

Overall, we considered available information on the species' occurrence, life history, and factors affecting viability. Where available, we also considered demographic information. However, for most populations in the United States, little information beyond presence/absence was available. Therefore, we evaluated the resiliency of populations primarily based on the degree of threats acting on populations. Because we do not have occurrence data for populations in Canada, we reviewed available literature, including the COSEWIC report, to assess the status of populations.

Because we are unable to determine exact boundaries for every Blanding's turtle population, we first delineated AUs to represent the area in which groups of Blanding's turtles are likely to interact and breed. We divided AUs into separate units when separated by barriers preventing movement and gene flow, such as highways with high traffic volume or high-intensity urban development. As noted above, we did not have access to occurrence data in Canada and were unable to delineate AUs within occupied provinces. We use AUs for the results of our resiliency analysis.

We defined populations with documented occurrences prior to 1990 as "historical" and those with records from 1990 or later as "extant." We selected a roughly 35-year period (1990 to 2023) to represent the current condition because we expect it could take at least one generation (approximately 37 years, Congdon et al. 1993, p. 829) for population changes to be discernible. We also selected this timeframe because documenting Blanding's turtles requires a relatively large level of search effort, and many records are from opportunistic observations.

To assess the resiliency of each extant Blanding's turtle AU, we evaluated road mortality risk, availability of suitable habitat, and population size under different levels of nest predation. Extent of suitable habitat did not have a large effect on the outcomes of our analysis (Service 2023, pp. 81–82). For AUs with estimated population sizes (3 percent of all AUs), we also evaluated the ability of the AU to withstand environmental and demographic stochasticity. Because information is not available on the amount of nest predation within each AU, we created modest and high nest predation scenarios to represent the range of plausible nest predation (species experts consider a low nest predation scenario not plausible without active management). For our future condition analysis, we created two additional scenarios to represent the plausible range of future climate and habitat conditions and their effects on future resiliency of AUs. Although conservation and management activities are important to the species, we did not consider them in our resiliency analysis because they do not occur on a rangewide scale.

To assess the amount of suitable habitat currently and in the future, we developed a rangewide habitat suitability map using factors known to drive the distribution, demographics, and fitness of Blanding's turtles, such as wetlands and open water, elevation (a proxy for other variables like topographic relief, soil, and wetland hydrology), land cover, and climate variables known to affect the Blanding's turtle's distribution, physiological health, and reproduction.

To assess road mortality risk, we developed a rangewide road mortality map that estimates annual road mortality of each AU. The estimated road mortality rates are based on distance to the closest road, traffic volume of the closest road, and annual movement patterns of Blanding's turtles.

To assess the resiliency of AUs at each time step, we defined resiliency categories based on the estimated amount of suitable habitat and road mortality, and population size (where available), under different levels of nest predation. Though we did not quantitatively estimate the probability of quasi-extirpation for AUs, we defined resiliency categories in terms of the chance of quasi-extirpation and the degree of certainty in the resiliency classification (quasi-extirpation represents an abundance greater than zero below which demographic, genetic, and environmental stochasticity synergistically interact, resulting in irreversible declines and eventual extinction for a population). The resiliency categories do not incorporate catastrophic factors, connectivity, or representation. The categories are excellent, good, fair, fair to poor, extirpation likely, extirpation very likely, and extirpated.

Although we provide the number of AUs in each resiliency category, we specifically highlight the AUs in fair, good, and excellent condition (hereafter referred to as "healthy" AUs). Based on our biological definitions of resiliency (Service 2023, pp. 48–66), these "healthy" AUs have: (1) enough turtles to withstand stochasticity, at least 20 ha (49.4 ac) of suitable habitat, and road mortality rates unlikely to lead to population extirpation over the next generation; or (2) populations with unknown abundance, but adequate suitable habitat (at least 100 ha (247 ac)), and road mortality rates compatible with stable population growth (adult survival over 92–95 percent, depending on the RPU). In other words, healthy AUs are either ones we know have a sizable population and are not facing severe habitat limitation and severe road mortality or that have an unknown population size but have adequate habitat and low enough road mortality that

population growth rates could be stable or increasing. These healthy AUs are therefore the most likely to contribute to the overall viability of the species.

We did not include AUs characterized as having "fair to poor" resiliency in our tally of healthy AUs because 99.7 percent of AUs in this resiliency category have estimated road mortality rates high enough to result in population decline. Thus, it is unlikely that AUs with "fair to poor" resiliency will meaningfully contribute to the overall viability of the species.

To assess connectivity among AUs, we considered land cover, distance between individual AUs, and road mortality risk when moving between AUs. We limited our analysis to AUs with resiliency categories of fair to poor, fair, good, and excellent because sites with resiliency lower than "fair to poor" are less likely to have substantial populations, and thus, are less likely to contribute to overall gene flow and colonization for other sites.

To consider the future condition of the Blanding's turtle, we assessed threats and the species' response to those threats to the year 2100, as this is the timeframe over which we could reliably project how the effects of increasing temperatures and changing precipitation patterns will impact habitat suitability. This timeframe also reflects roughly three generations (as previously discussed, one generation = 37 years) and thus allowed us to estimate demographic response to current road mortality threat over a meaningful timeframe for the species. Thus, we consider this timeframe to be the foreseeable future for the Blanding's turtle. We considered two future scenarios. We used SSP2–4.5 (intermediate emissions) for the lower bound scenarios and SSP5–8.5 (high emissions) for the upper bound scenarios (Service 2023, table 4-2).

We projected habitat suitability to mid- and late century. The land cover data used in the analyses includes road cover, so the impact of potential road expansion on habitat suitability is accounted for in our analysis. However, we did not project road mortality

risk as increasing into the future. We held traffic at current levels when developing the road mortality map, as the computational time to project traffic and road mortality risk into the future would be high, and the effort would yield limited additional value given that the species is projected to be heavily impacted under current traffic levels. Thus, annual road mortality risk is held at current estimated levels for all future scenarios.

Current Condition

In this section, we summarize the results of our current condition analysis as presented in the SSA report (Service 2023, pp. 67–94; appendix F, appendix G). We describe available information on populations, the current condition of each RPU in the United States, and the status of populations in Canada. Based on our analysis, the Blanding's turtle currently occurs in 1,810 AUs rangewide and is estimated to occupy 55,337 km^2 (24,803 mi^2), a 14 percent decrease from historical conditions (circa 1960–1990).

As outlined earlier, the Blanding's turtle's longevity and delayed sexual maturity mean that the threats currently acting on the species will take at least one generation (or roughly 37 years) to manifest demographically. Below we describe the viability of each RPU.

Great Plains RPU

The largest known Blanding's turtle population occurs within the Great Plains RPU in central Nebraska and is estimated to contain more than 100,000 individuals. Though intensive sampling has not been conducted since the early 2000s, recent surveys indicate that abundance within the population has remained high, likely due to expansive habitat that is protected as a national wildlife refuge.

Given the current threat levels, the Great Plains RPU is expected to retain the highest proportion of healthy AUs over the next generation under both nest predation scenarios. This RPU is on average exposed to the lowest road mortality (1.2 percent) and

consequently, we estimate that 27–78 percent of AUs are currently experiencing road mortality rates low enough to permit stable population growth. In total, this RPU is expected to retain 16–53 healthy AUs over the next generation, depending on nest predation scenario. In addition, no AUs are expected to face extirpation over the next generation due to road mortality, suitable habitat is projected to remain well distributed across AUs, and connectivity is expected to remain high. While abundance is not well-documented in general across the Great Plains RPU, one AU in this RPU is well studied, and contains the largest population of Blanding's turtle rangewide, estimated in 2004 to number more than 100,000 individuals (Lang 2004, p. 31). Recent surveys indicate that abundance at this large AU has remained high, despite appreciable road mortality in some locations where a large road passes through the AU (Lang 2022, pers. comm.). The population is likely stable because there is also an extensive amount of habitat that is not near roads (Lang 2004, p. 31; Lang 2022, pers. comm.), and we expect this AU will maintain excellent resiliency over the next generation.

Our connectivity analysis suggests that the Great Plains RPU will retain a relatively high degree of connectivity between AUs over the next generation. We estimated that 74 percent of the AUs in this RPU have better than poor resiliency and are connected to at least one other such AU (hereafter termed "connected") (Service 2023; table 5-10, figure 5-12). The median distance between connected AUs is relatively large given the species' typical dispersal patterns, but the risk of road mortality is relatively low between connected AUs. This finding indicates a potential for at least moderate levels of gene flow and recolonization in this RPU.

Given the relatively low level of urbanization in the Great Plains RPU, the moderate nest predation scenario may be more representative of current circumstances within this RPU since there is evidence that raccoon density is significantly higher in urban and suburban areas than in rural areas (Prange et al. 2003, p. 324). Indeed, although

nest predation can be significant even in natural and agricultural landscapes (Browne and Hecnar 2007, p. 427; King 2013, p. 32), raccoon predation on Blanding's turtle eggs is thought to be especially high in human-dominated urban landscapes (King 2013, p. 32). Based on data from the Integrated Climate and Land Use Scenarios project (U.S. Environmental Protection Agency 2016, entire), we estimate that urban development constitutes only 0.1 percent of the land in the Great Plains AUs in 2020. Though urbanization rates are only a coarse proxy of raccoon density and raccoons are not the sole nest predator of Blanding's turtles, a low level of urban development in AUs provides some evidence that the moderate nest predation scenario may be more common in the Great Plains RPU. Thus, the number of healthy AUs in this RPU may be closer to 53 (72 percent of the total) than 16 (22 percent of the total). Consequently, minimal loss of resiliency, redundancy, and representation is expected in the Great Plains RPU over the next generation.

North Central RPU

Given the current threat levels, the North Central RPU is expected to retain 25–185 healthy AUs over the next generation, which constitutes 5–34 percent of the total AUs in the RPU. Suitable habitat is expected to remain well distributed across AUs in the North Central RPU, and connectivity between AUs is expected to remain relatively high. This finding indicates a potential for at least moderate levels of gene flow and recolonization. However, AUs in this RPU are exposed to 3.2 percent annual road mortality on average, which is consequential because even a small decline in adult survival rate (2–3 percent) can lead to population decline for Blanding's turtle (Congdon et al. 1993, p. 831). While we estimate that road mortality rates in 6–39 percent of AUs are low enough to permit stable population growth, we estimate that 13–23 percent of AUs experience road mortality rates high enough to lead to quasi-extirpation over the next generation, and road mortality is considered a substantial threat to Blanding's turtle

populations in two of the three States within the RPU (NatureServe 2023, p. 3; MWPARC 2010, p. 21).

Abundance is not well-documented across the North Central RPU; however, the three well-studied populations have a median abundance of 308 individuals (Service 2023, table 6-8) and are above the minimum required population size needed to withstand environmental and demographic stochasticity one generation into the future. These three populations are all estimated to be healthy in the current condition. The connected AU clusters in the North Central RPU contain large numbers of AUs on average (96–192), which can boost the potential for recolonization following catastrophic events over the next generation.

Nest predation levels are not comprehensively documented across the RPU; however, some evidence suggests that moderate nest predation rates may be more prevalent (Service 2023, pp. 130–131). If this is indeed the case, the number of AUs remaining healthy over the next generation may be upwards of 34 percent. This estimate would represent a reduction in the Blanding's turtle's resiliency, distribution, and range extent, which could reduce the species' ability to withstand catastrophic factors. However, a large number of AUs (185) may remain healthy, and AUs are expected to retain a relatively high level of connectivity over the next generation, which could facilitate recolonization following catastrophic events.

South Central RPU

The second largest known Blanding's turtle population is located in southeastern Minnesota and in 2000 was estimated to consist of 2,500–4,600 individuals. However, the population is estimated to have declined by 40–60 percent since then, due to illegal collection and road mortality, particularly of nesting females. Another large population occurs on the Wisconsin–Illinois border within the South Central RPU and is estimated to consist of 800 adults. With nest protection efforts, this population appears to have

remained stable, as has a population in Wisconsin in the North Central RPU at which habitat restoration has occurred. A fourth large population is in southern Michigan and is estimated to contain roughly 100–250 individuals. Though recent population estimates have not been reported, the population appears to have remained stable, likely in part due to nest protection efforts and its occurrence within an area with limited access to the public such that unauthorized collection is minimized. Beyond the populations described above, limited information is available on the number and health of large populations (those containing more than 100 individuals).

Some States, such as Minnesota, Michigan, and Wisconsin, have numerous element occurrence (EO) records (over 500), indicating a wide distribution of Blanding's turtles in these States (Service 2023, table 5-1). The proportion of EOs at which Blanding's turtles have been confirmed since 1990 is very high in many States, and some States have even assigned viability ranks to EO records based on the amount of suitable habitat, land protection, and proximity to roads.

Given the current threat levels, the South Central RPU is expected to retain 40–174 healthy AUs over the next generation (4–19 percent). Suitable habitat is expected to remain well distributed across AUs. However, AUs in the South Central RPU experience an estimated 7.5 percent annual road mortality on average, which can have important consequences given that a 2–3 percent drop in adult mortality can lead to population decline (Congdon et al. 1993, p. 831). As a result, while we estimate that 4–22 percent of AUs experience road mortality rates low enough to permit stable population growth, 44–58 percent of AUs are experiencing road mortality rates high enough to cause quasi-extirpation in a population of 200 turtles in the current condition.

Road mortality, therefore, poses a substantial threat in the South Central RPU, which is consistent with documented road mortality for this region. Blanding's turtle sites in Illinois are either partially or fully surrounded by roads or bisected by roads and rail

lines (MWPARC 2010, p. 21), and proximity to roads with high traffic volumes (as well as railways) poses a significant risk for many Blanding's turtle populations in Illinois (King 2013, p. 35; King 2023, pers. comm.). Populations in the Chicago area are at particularly high risk given the high density of roads (Thompson et al. 2018, p. 12). Though road mortality rates are not well studied in Iowa, increased mortality from roads is estimated to occur at most, if not all, populations (MWPARC 2010, p. 23). Most populations in Indiana are also thought to be in decline, with road mortality considered one of the threats (Kingsbury et al. 2021, p. 36). In Wisconsin, road densities are highest in the southern portion of the State, and these areas of high density are associated with male-skewed sex ratios, likely due to mortality of females during nesting movements (Reid and Peery 2014, p. 6).

While many sites with known abundance in this RPU are relatively small, three large populations are documented, all of which are considered healthy in our current condition analysis. Although abundance did not directly impact the outcome of our resiliency assessment in any of the AUs in this RPU, the South Central RPU had the highest proportion of populations with known abundance that are also estimated to be at risk of quasi-extirpation over the next generation due to environmental and demographic stochasticity (24–48 percent). We classified resiliency as fair if abundance was unknown but habitat was abundant and road mortality did not pose a threat. However, if abundance estimates at well-studied sites are representative of population size across the RPU, some AUs in the South Central RPU categorized as fair may have populations small enough that demographic and environmental stochasticity could lead to quasi-extirpation in the current condition. Thus, small population size may be an important, but under-represented factor impacting resiliency in the South Central RPU.

Nest predation levels are not comprehensively documented in the South Central RPU; however, several lines of evidence suggest that high nest predation rates may be

more common. Under the high nest predation scenario in the South Central RPU, 174 healthy AUs, at most, will remain over the next generation (19 percent), with projections closer to 40 healthy AUs (4 percent) being more likely. The South Central RPU could, therefore, experience a considerable decline in resiliency, geographic distribution, and range extent over the next generation, which could reduce the species' ability to withstand catastrophic factors.

Connectivity in this RPU is expected to be moderate with 27–41 percent in the South Central RPU remaining connected. However, individuals in these RPUs must cross 8.9–9.6 km on average to facilitate gene flow or recolonization, which is large relative to the species' typical dispersal patterns. Thus, the potential for recolonization following catastrophic events is expected to be reduced, but still present, even under the high nest predation scenario (in which 27 percent of AUs are projected to remain connected). However, given that a relatively small proportion of AUs is expected to remain healthy, there is the potential for loss of adaptative capacity and raw genetic materials over the next generation. Coupled with reduced connectivity and gene flow, this could compromise the Blanding's turtle's ability to cope with changing environmental conditions through mechanisms like behavioral and phenotypic plasticity.

New York and New England RPUs

Given the current threat levels, we estimate that only 2–6 AUs (3–9 percent) in the New York RPU and 7–8 AUs (4 percent) in the New England RPU may remain healthy over the next generation. In addition, nearly all remaining healthy AUs are expected to be in fair, rather than good or excellent, condition. The low resiliency in these RPUs is primarily driven by road mortality, with less than 1 percent of AUs in the New England RPU and less than 5 percent in the New York RPU estimated to currently experience road mortality rates compatible with stable population growth. Thus, many populations in these RPUs are likely experiencing population declines due to road

mortality. In fact, road mortality may currently be high enough to result in quasi-extirpation of 37–52 percent of populations in the New York RPU and 80–86 percent of populations in the New England RPU in the current condition. These results are consistent with previous studies that identify road mortality as one of the most important threats to Blanding's turtle in many parts of the Northeast (Compton 2007, p. 56; Ross and Johnson 2018, p. 19; Willey et al. 2021, p. 12).

The NEBTWG has also documented recent loss of wetland habitats and increases in urbanization, road development, and habitat fragmentation within priority Blanding's turtle sites in New England and New York (Willey et al. 2021, p. 10). Thus, while road mortality is likely the biggest driver of resiliency, ongoing habitat loss may also be important in the New England and New York RPUs.

Comprehensive and standardized surveys have occurred throughout much of the New England and New York RPUs, producing abundance estimates for all sizable populations and some smaller populations (Willey et al. 2021, p. 12). Median abundance at sites with population estimates is 39 turtles in the New York RPU and 68 turtles at sites in the New England RPU. The largest population in New England, estimated at approximately 570 (±38) individuals, is estimated to currently be in excellent resiliency, as it is in a protected refuge and is fenced to minimize road mortality.

Due to the magnitude of the road mortality threat, the estimated resiliency of AUs within the New York and New England RPUs does not differ widely between the high and moderate nest predation scenarios. However, available information indicates that the actual extent of nest predation may be closer to the high nest predation scenario than the modest nest predation scenario given the relatively high urban cover in AUs (41 percent in the New England RPU and 67 percent in the New York RPU), which can correspond with higher raccoon densities.

Collectively, these results suggest that current threats are leading to a continued decline in abundance, number of populations, geographic distribution, and range extent in the New England and New York RPUs over the next generation. The Blanding's turtle is therefore at risk of diminished redundancy in the northeastern portion of its range, particularly in the New England RPU, where connectivity is expected to be substantially reduced over the next generation. As populations in this region continue to decline, they are likely to be more vulnerable to stochastic factors and processes like genetic drift and inbreeding (Caughley 1994, pp. 217–224; Godwin et al. 2020, p. 4227). In addition, when populations are isolated, demographic and genetic rescue effects from nearby populations can be diminished.

There may also be a continued decline of adaptive capacity and genetic diversity within the RPUs over the next generation. Populations in the Northeast (east of the Appalachians) have been identified as an evolutionarily significant unit (species that are on a separate evolutionary trajectory; Mockford et al. 2007, p. 209), and populations in New York are genetically divergent from others across the U.S. range (Mockford et al. 2007, p. 214). Thus, loss of this unique genetic diversity can reduce adaptive capacity. Furthermore, within the Northeast (Maine, New Hampshire, Massachusetts, New York, and Pennsylvania), the NEBTWG has delineated 12 ecologically significant units, which in addition to genetic data (as is typically used to define an evolutionarily significant unit) were also delineated based on biogeography, and ecoregional uniqueness (Willey et al. 2021, p. 56). Loss of representation across these unique ecoregions, in combination with low connectivity and gene flow, could compromise the species' ability to cope with changing environmental conditions through mechanisms like behavioral and phenotypic plasticity.

Blanding's Turtle Populations in Canada

We were unable to obtain locality data for populations in Canada, and thus, we could not quantitatively assess the amount of suitable habitat and road mortality risk of populations. Therefore, provided below is a narrative summary of the status of Blanding's turtle populations in Canada.

In Canada, the Blanding's turtle occurs in Ontario and Québec (which we define as the Central Canada RPU) and Nova Scotia (the Nova Scotia RPU). In Ontario, the species occurs mainly in the southeastern portion of the province, and its distribution is not continuous, with few to no records in large portions of the province (COSEWIC 2016, p. 10). Within Québec, the Blanding's turtle occurs mainly within the far southwestern portion, but the spatial extent of the subpopulation continues to expand with additional sampling (COSEWIC 2016, pp. 10, 15; QTRT 2020, p. 5). In Nova Scotia, the distribution of Blanding's turtles appears to be restricted to a few watersheds in the southwestern portion of the province (COSEWIC 2016, p. 7).

In Ontario, genetic analyses indicate there are at least two genetically distinct Blanding's turtle populations (Davy et al. 2014, pp. 323–325), with the two populations further divided into 20 different subpopulations (COSEWIC 2016, pp. 29–31). Of the 9 subpopulations with size estimates, only 4 are estimated to contain more than 100 adults, and only 2 of these are estimated to contain more than 500 adults (estimated sizes of 690 and 818) (COSEWIC 2016, pp. 12–13).

Of the 20 known subpopulations within Ontario, large population declines have been observed in 6, with up to 50–95 percent declines reported at some sites over the last 10 to 30 years (less than 1 generation) (COSEWIC 2016, p. 28). Large declines are also inferred and projected for another 11 subpopulations based on threats, with annual road mortality estimated at 6–23 percent of the estimated population size (COSEWIC 2016, pp. 28–31). Thus, 80 percent of the subpopulations within Ontario have likely

experienced population declines. The population trend is unknown for the remaining four subpopulations (COSEWIC 2016, pp. 28–31).

The size of the one known Blanding's turtle subpopulation in Québec has not been estimated (COSEWIC 2016, p. 13). However, 188 different adults were captured from 1996 to 2013 (COSEWIC 2016, p. 13). The Blanding's turtle subpopulation in Québec is considered to be declining based on historical loss of habitat for agricultural uses (COSEWIC 2016, p. 32).

In Nova Scotia, the majority of known Blanding's turtle locations occur in three main subpopulations within two watersheds (COSEWIC 2016, p. 10). In 2012, three small concentrations of individuals (three to eight adults) were confirmed near these subpopulations, but it is unclear if these individuals are part of one or more of the subpopulations (COSEWIC 2016, p. 10). A fourth Blanding's turtle subpopulation was recently discovered in Nova Scotia in 2016 (COSEWIC 2016, p. 10). However, the relationship of this subpopulation to the other three subpopulations is unknown (COSEWIC 2016, p. 7). The 3 main subpopulations have estimated sizes of 76, 118, and 131 adults (COSEWIC 2016, pp. 13–14). The size of the recently discovered fourth subpopulation is unknown (COSEWIC 2016, p. 10). However, 32 individuals were captured during 2 months of sampling, suggesting it may be a sizable subpopulation (COSEWIC 2016, p. 14).

One of the known Blanding's turtle subpopulations within Nova Scotia is inferred to have declined based on the large number of females collected historically for scientific purposes (COSEWIC 2016, p. 32). This subpopulation is projected to continue to decline (COSEWIC 2016, p. 32). The population trend is unknown for the remaining two subpopulations (COSEWIC 2016, p. 32).

Current Condition Summary

Collectively, the available information does not allow a conclusive rangewide assessment of the overall historical condition of Blanding's turtle populations and how the historical condition affects our understanding of current condition. Despite this uncertainty, a few conclusions are clear. First, while some populations are considered stable and doing well, many populations appear to have declined, and observations of the species have decreased in many areas of the range. Second, the extensive research on the species has demonstrated a clear demographic response to key threats including habitat loss and road mortality. Third, throughout the literature, researchers note increased rates of nest predation by mesopredators. While nest predation can vary substantially among sites and years, chronic increases in nest and hatchling mortality will ultimately result in population declines. Fourth, it is very difficult to discern population trends without long-term extensive monitoring, and the continued presence of adults is not necessarily indicative of a healthy population. Lastly, results of many studies indicate that genetic diversity in Blanding's turtle populations has declined and is attributed to reduced gene flow among populations due to road mortality (particularly of females), habitat fragmentation, and the presence of crop fields that reduce nest success.

Under current threat levels, we estimate that 5–24 percent of the AUs across the species' range will remain healthy over the next generation; however, the number of healthy AUs differs markedly between RPUs (table 2). Consequently, Blanding's turtle resiliency, redundancy, representation, connectivity, and viability will likely continue to decline over the next generation in our current condition timeframe, though at different rates across the RPUs.

Table 2—Blanding's Turtle Resiliency Across the U.S. Representation Units

[Numbers depict the AUs in each resiliency class, with the range in values representing the different nest predation scenarios. Categories in which AUs are considered healthy are in bold. The total number of AUs and the percent of AUs classified as healthy are shown for each U.S. RPU and rangewide.]

Resiliency	Great Plains RPU	North Central RPU	South Central RPU	New York RPU	New England RPU	Range-wide
Excellent	1	0–2	1–9	0	1	3–13
Good	0	0	0–1	0	0	0–1
Fair	15–52	25–183	39–164	2–6	7–8	88–413
Fair to Poor	13–50	231–340	261–274	27–33	19–30	568–710
Poor	2–5	6–19	6–21	0–0	3–4	17–49
Extirpation likely	2–5	84–147	381–506	24–34	183–191	674–883
Extirpation very likely	0	6–7	52–63	1	15–20	74–91
Extirpated	0	4	4	0	0	8
Total healthy AUs	16–53	25–185	40–174	2–6	8–9	91–427
Total AUs	74	530	897	66	243	1,810
Percent healthy AUs	22–72%	5–34%	4–19%	3–9%	4%	5–24%

Future Conditions

In this section, we present results from our analysis of the Blanding's turtle's future condition at mid and late century, under two climate and land use change scenarios and two nest predation scenarios. These results reflect the projected condition of the species into the future in the absence of management and conservation activities, given that we do not have adequate information to forecast them. The mid-century future projections represent two generations of Blanding's turtles, and the late century projections represent three generations of Blanding's turtles.

As with our current condition analysis, we focus our discussion on healthy AUs. These are the AUs that are not projected to experience severe road mortality or severe habitat limitation and are not at risk of quasi-extirpation due to small population size. These AUs represent the sites most likely to contribute to the overall viability of the species. At both mid and late century, over 93 percent of AUs classified as having fair to poor resiliency are projected to have road mortality rates high enough to cause population

declines. We, therefore, assume that AUs classified in the fair to poor resiliency category do not contribute meaningfully to the overall viability of Blanding's turtles.

We have limited information on populations in Canada to project future conditions in that part of the range. The COSEWIC estimated that the Blanding's turtle has at least a 20 percent probability of extinction within 20 years in Ontario and also has a 20 percent probability of extinction within 20 years in Nova Scotia (COSEWIC 2016, p. xv). Probability of extinction was not estimated for Québec populations.

Great Plains RPU

Given current road mortality threats and future projections in habitat suitability, the Great Plains RPU is expected to retain 4–22 healthy AUs at mid and late century, representing 5–30 percent of the total AUs in this RPU. Even if the moderate nest predation scenario is most representative in this RPU, this estimate represents a 59 percent decline in the number of sufficiently resilient AUs at mid-century compared to current condition with minimal subsequent loss at late century. The projected declines in resiliency are mainly driven by changes in habitat suitability, though road mortality also is a factor. A reduction in connectivity is also projected in this RPU, driven by a decline in the number and distribution of sufficiently resilient populations.

However, the Great Plains RPU contains the Nebraska Sandhills region, which in the short term is likely to be buffered from drought to some degree by groundwater stores (Whitcomb 1989, p. 61), particularly in areas where there is limited irrigation pressure, including the large population in central Nebraska. This expected drought resistance could modestly buffer some of the projected declines in habitat suitability in the short term and may provide some microclimate holdouts (temporary refugia) that may allow Blanding's turtle populations to remain temporarily on the landscape in small pockets, even in areas projected to otherwise experience loss of climatically suitable habitat. However, long-term microrefugia are expected to be rare in the future due to the

sustained trajectory of increasing temperatures (Hannah et al. 2014, pp. 392–393, 395), which may limit the potential for long-term microrefugia for the species.

The Great Plains RPU also contains the largest population of Blanding's turtles across the range, which we expect to remain in excellent condition at mid and late century. This population is in a protected national wildlife refuge and may be particularly buffered from habitat loss into the future due to limited irrigation pressure. However, outside this large population, some loss of representation and redundancy may occur in the Great Plains RPU by mid-century, given the projected decline in the number and distribution of healthy AUs. Nebraska has designated a set of "Biologically Unique Landscapes" within the State across which Blanding's turtles are currently distributed (Panella and Rothe-Groleau 2023, p. 5), and loss of demographically and genetically robust populations within any of these regions could result in diminished representation and redundancy in this RPU. Furthermore, populations in Nebraska exhibit unique demographic traits that may contribute importantly to overall species' viability, such as a lower age of first reproduction (King et al. 2021, p. 125), which can increase lifetime fecundity, and large egg size, which may increase the ability of eggs and hatchlings to avoid desiccation (Ruane et al. 2008, p. 776). These adaptive-capacity traits may be important to the species' ability to persist and evolve (over time scales much longer than those assessed in the SSA report and this proposed rule), particularly given projected changes in climate.

North Central RPU

Over the next two generations at mid-century, the number of healthy AUs in the North Central RPU is expected to modestly increase compared to current estimates due to a small projected increase in suitable habitat in AUs at more northern latitudes; healthy AUs are projected to increase from 25–185 to 27–192 (under moderate and high nest predation scenarios). No further changes to the number of healthy AUs are projected over

the subsequent generation at late century. In addition, up to 64 percent of sites are projected to remain connected over the next two generations, and up to 60 percent over the next three generations, which can facilitate recolonization following catastrophic events. Thus, while some loss of resiliency and redundancy is expected in this RPU over one generation, no additional loss of resiliency is expected to occur over the subsequent two generations, assuming nest predation remains moderate. However, if hatchling recruitment is reduced in the future due to increased nest predation or some other threat, a subsequent loss of resiliency could occur over two and three generations.

South Central RPU

In the South Central RPU, healthy AUs are projected to represent 3–18 percent of the total by mid-century, and 3–16 percent by late century, suggesting modest subsequent declines in resiliency, redundancy, and representation compared to current conditions. If the high nest predation scenario is most likely in this RPU in the foreseeable future, the RPU is projected to experience a 23 percent loss of healthy AUs, relative to the current situation, over two generations (40 healthy AUs to 30) and a 32 percent loss over 3 generations (40 healthy AUs to 27). While a large majority of healthy AUs are projected to be in fair, rather than good or excellent, resiliency at mid- and late century, the South Central RPU does maintain the largest number of sites in excellent resiliency into the future. However, road mortality is projected to remain a key threat for the South Central RPU compared to current conditions, and the region is projected to experience a 35–46 percent and a 51–75 percent decline in the amount of suitable habitat by mid-century and late century, respectively. In addition, the South Central RPU is also projected to experience an ongoing reduction in connectivity into the future, driven by changes in the distribution and number of healthy AUs.

Effects associated with small population size may be an important factor influencing the future resiliency of Blanding's turtles in the South Central RPU. For

instance, under the high nest predation scenario, 74 percent of populations with abundance estimates are projected to be at risk of quasi-extirpation after two generations due to environmental and demographic stochasticity, and 84 percent after three generations. Because we have abundance data for only 31 of 897 AUs in the South Central RPU, small population size reduced the resiliency rankings in our analysis for only a small number of RPUs, and sites with unknown abundance and no severe threats were optimistically estimated to have fair resiliency. Small populations are more vulnerable to processes like genetic drift and inbreeding, which can synergistically interact to further reduce population sizes (Caughley 1994, pp. 217–224; Godwin et al. 2020, p. 4227). Genetic analyses suggest that Blanding's turtle populations in portions of Ohio, Indiana, and Michigan could be at risk of losing up to 50 percent of the observed genetic diversity in the next 200 years due to subsequent declines (Guinto 2021, p. 60).

New England and New York RPUs

Given current road mortality threats and projected changes in habitat suitability, we estimate that four to seven AUs (2 to 3 percent) will remain healthy in the New England RPU and at most five in the New York RPU at mid-century. Between the two RPUs, only one AU is projected to be in excellent resiliency at mid-century (in the New England RPU), and none are expected to be in excellent resiliency by late century (in either RPU). The New England RPU is projected to experience a 55–84 percent decline and the New York RPU a 20–33 percent decline overall in suitable habitat by mid-century relative to current conditions. Both RPUs are also projected to experience a substantial decline in connectivity by mid-century, driven by a reduction in the number and distribution of healthy populations. By late century, at most three AUs are projected to remain healthy in the New England RPU, and at most four AUs in the New York RPU. Connectivity is projected to be severely reduced in both RPUs by late century.

Our results, therefore, indicate that historical reductions in representation and redundancy already evident in the New England and New York RPUs will continue into the foreseeable future. Furthermore, while catastrophic events like severe drought, pollution, or disease are low-probability events, the cumulative risk of these events compounds over time, and with the loss of redundancy, there would be fewer populations in the Northeast to insure against catastrophic events.

Future Temperature and Precipitation Changes and Adaptive Capacity

Our habitat suitability maps indicate that by mid-century the Blanding's turtle will experience a 22–32 percent reduction in suitable habitat rangewide compared to current conditions and a 37–63 percent reduction rangewide by late century, with much of this loss occurring along the southern range limit. These results suggest that Blanding's turtles will face high exposure to changing temperature and precipitation impacts, particularly in more southern populations, a finding echoed by other studies (King and Niiro 2013, p. 38; Hamilton et al. 2018, p. 1; Byer et al. 2020b, pp. 398–399). However, our projections of habitat suitability are more optimistic than previous studies. For instance, King and Niiro (2013, p. 38) projected much more dramatic loss of suitable habitat on the range margins in Nebraska and Massachusetts. In addition, other studies focused on just Wisconsin project more drastic declines in habitat suitability in the northern portion of the range (Byer et al. 2020a, pp. 398–400; Hamilton et al. 2018, pp. 80–81). Thus, our estimates of habitat suitability may be overly optimistic, particularly in the Great Plains, New England, and North Central RPUs.

Future Condition Summary

By mid-century under our future projections (table 3, table 4), less than 25 percent of AUs within the Blanding's turtle's range are expected to remain healthy. The proportion of healthy AUs is expected to decline further by late century. These results indicate that an irretrievable loss of adaptive capacity is likely to occur, particularly in the

Northeast, and that the Blanding's turtle's ability to withstand stochasticity, changing conditions, and catastrophes may be substantially compromised in the foreseeable future. Additionally, given already restricted gene flow and limited potential for recolonization, fragmentation will likely further reduce the species' viability, particularly in the New York and New England RPUs.

Relative to our current conditions analysis, we project continued decreases to mid-century in all RPUs except the North Central RPU. Given estimated current road mortality levels and projections of habitat suitability out to mid-century, we estimate that 4–21 percent of AUs rangewide will remain healthy over the next two generations (at mid-century). This includes maximum estimates (across scenarios) of 36 percent healthy AUs in the North Central RPU, 30 percent in the Great Plains RPU, 18 percent in the South Central RPU, 8 percent in the New York RPU, and 2 percent in the New England RPU over the next two generations.

From mid to late century across the RPUs, we project minimal additional change in the number of healthy AUs; the largest decline from mid-century is projected in the New England RPU. Given current road mortality levels and projections of habitat suitability out to late century, we estimate that 4–21 percent of AUs rangewide will remain healthy over the next three generations. This projection includes maximum estimates (across scenarios) of 36 percent healthy AUs in the North Central RPU, 30 percent in the Great Plains RPU, 15 percent in the South Central RPU, 6 percent in the New York RPU, and 1 percent in the New England RPU over the next three generations (table 5, table 6).

Consequently, the resiliency, redundancy and representation of Blanding's turtle will likely continue to decline over the next three generations in all but the North Central RPU. The largest decline from current to mid-century is projected to occur in the Great

Plains RPU, and the largest decline from mid to late century in the New York and New England RPUs.

Over the next three generations, at late century, loss of genetic diversity may compound projected declines in resiliency, redundancy, and representation. As populations decline in abundance due to ongoing road mortality threats and habitat loss, they become at greater risk of losing genetic diversity. Blanding's turtle populations are estimated to need at least 100–200 adult individuals to retain at least 95 percent of existing genetic diversity over 100 years (King et al. 2021, p. 124), and the median population size of AUs with abundance estimates is currently much lower than this threshold in all but the North Central and Great Plains RPUs. Given that we estimate only 4–25 percent of AUs rangewide are currently exposed to road mortality rates low enough to permit stable population growth rate, population size is more likely to decline into the future at most sites, rather than increase, posing a risk of loss of genetic diversity over the next three generations.

Table 3—Blanding's Turtle Resiliency in the United States After Two Generations Under Lower Impacts

[Numbers depict the AUs after two generations within each RPU in each resiliency class under the lower impact scenario (SSP2–4.5), with the range in values representing the different nest predation scenarios. Categories in which AUs are considered healthy are in bold.]

Resiliency	Great Plains RPU	North Central RPU	South Central RPU	New York RPU	New England RPU	Total
Excellent	1	0–2	1–9	0	1	3–13
Good	0	0	0–1	0	0	0–1
Fair	3–21	27–189	32–147	0–5	5–6	67–368
Fair to Poor	10–20	156–185	116–153	3–20	2–16	297–384
Poor	14–30	7–16	11–34	0	0–1	32–81
Extirpation likely	9–24	131–333	401–553	28–44	140–146	709–1,100
Extirpation very likely	0–9	6	137–169	11–17	77–87	288–231
Extirpated	2	0	11	0	0	13
Total healthy AUs	4–22	27–191	33–157	0–5	6–7	70–382
Total AUs	74	530	897	66	243	1,810
Percent healthy AUs	5–30%	5–36%	3–18%	0–8%	2–3%	4–21%

Table 4—Blanding's Turtle Resiliency in the United States After Two Generations Under Higher Impacts

[Numbers depict the AUs after two generations within each RPU in each resiliency class under the higher impact scenario (SSP5–8.5), with the range in values representing the different nest predation scenarios. Categories in which AUs are considered healthy are in bold.]

Resiliency	Great Plains RPU	North Central RPU	South Central RPU	New York RPU	New England RPU	Total
Excellent	1	0–2	1–9	0	0	2–12
Good	0	0	0–1	0	0	0–1
Fair	3–21	27–190	30–139	0–5	4–5	64–360
Fair to Poor	10–20	157–184	111–148	3–20	2–8	293–370
Poor	14–30	6–16	15–38	0	1–6	36–90
Extirpation likely	9–24	131–333	371–510	24–40	77–79	614–984
Extirpation very likely	0–9	6	171–210	15–21	143–157	335–403
Extirpated	2	0	16	0	0	18
Total healthy AUs	4–22	27–192	31–149	0–5	4–5	66–373
Total AUs	74	530	897	66	243	1,810
Percent healthy AUs	5–30%	5–36%	3–17%	0–8%	2%	3–21%

Table 5—Blanding's Turtle Resiliency in the United States After Three Generations Under Lower Impacts

[Numbers depict the AUs after three generations within each RPU in each resiliency class under the lower impact scenario (SSP2–4.5), with the range in values representing the different nest predation scenarios. Categories in which AUs are considered healthy are in bold.]

Resiliency	Great Plains RPU	North Central RPU	South Central RPU	New York RPU	New England RPU	Total
Excellent	1	0–2	1–9	0	0	2–12
Good	0	0	0–1	0	0	0–1
Fair	3–21	27–189	27–133	0–4	0–3	57–350
Fair to Poor	9–10	38–160	41–118	0–15	1–4	89–307
Poor	11–30	6–16	7–39	0	0–5	24–90
Extirpation likely	8–29	154–450	375–546	26–42	58–63	626–1,125
Extirpation very likely	1–18	8	200–253	19–22	166–182	394–483
Extirpated	2	0	18	0	0	20
Total healthy AUs	4–22	27–191	28–143	0–4	0–3	59–363
Total AUs	74	530	897	66	243	1,810
Percent healthy AUs	5–30%	5–36%	3–16%	0–6%	0–1%	3–20%

Table 6—Blanding's Turtle Resiliency in the United States After Three Generations Under Higher Impacts

[Numbers depict the AUs after three generations within each RPU in each resiliency class under the higher impact scenario (SSP5–8.5), with the range in values representing the different nest predation scenarios. Categories in which AUs are considered healthy are in bold.]

Resiliency	Great Plains RPU	North Central RPU	South Central RPU	New York RPU	New England RPU	Total
Excellent	1–1	0–2	1–9	0	0	2–12
Good	0	0	0–1	0	0	0–1
Fair	3–17	27–178	26–128	0–4	0–1	56–328
Fair to Poor	8–10	35–149	40–105	0–9	1–1	84–274
Poor	11–34	8–30	7–47	0–2	0–6	26–119
Extirpation likely	8–27	144–418	257–407	18–26	17–30	457–895
Extirpation very likely	1–21	24–39	318–384	31–38	203–223	577–705
Extirpated	2	2	28	0	0	32
Total healthy AUs	4–18	27–180	27–138	0–4	0–1	58–341
Total AUs	74	530	897	66	243	1,810
Percent healthy AUs	5–24%	5–34%	3–15%	0–6%	0–0.4%	3–19%

Determination of Blanding's Turtle Status

Section 4 of the Act (16 U.S.C. 1533) and our regulations at 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 Its Range

Blanding's turtles need multiple healthy populations that are distributed across the species' range to reduce the risk of extinction. To determine whether the Blanding's turtle may be endangered throughout all of its range, we reviewed the best scientific and

commercial data regarding threats to the species, the species' responses to those threats, and any associated conservation measures under the Act's section 4(a)(1) factors. We determined that the species has experienced a deterioration in resiliency, redundancy, and representation relative to historical conditions, due primarily to habitat loss (Factor A), road mortality (Factor E), and reduced recruitment due to nest predation (Factor C). The Blanding's turtle is also facing threats associated with increasing temperatures and changing precipitation patterns (Factor E), pollution (Factor E), and unauthorized collection (Factor B). Though some regulatory mechanisms and conservation measures locally address some threats, such as nest predation and road mortality, these measures are not occurring at such a level that they are significantly reducing the magnitude of threats rangewide.

While the Blanding's turtle has experienced loss of habitat since the 1700s, and results of our analyses indicate that its distribution decreased 14 percent in the period 1960–1990, the species currently occurs throughout much of its historical range throughout all 5 RPUs. To assess the near term risk of extinction, we estimated viability out one generation. We found that 5–24 percent (91–427) of Blanding's turtle AUs are currently healthy. Road mortality is currently the factor most heavily impacting resiliency, particularly within the South Central, New York, and New England RPUs. However, the North Central and Great Plains RPUs maintain multiple healthy, connected populations in the near term. In addition, connectivity remains high in these RPUs. We estimated that 74 percent (55) of the AUs in the Great Plains RPU and 64–74 percent (339–392) of the AUs in the North Central RPU have better than poor resiliency and are connected to at least one other such AU. This estimate indicates a potential for at least moderate levels of gene flow and recolonization in these RPUs even for populations currently ranked as unhealthy, particularly in the Great Plains RPU where estimated road mortality is 7 percent and the distance between AUs is 8.3 km (5.2 miles). Moreover, the

connected AU clusters in the North Central RPU contain a large number of AUs on average (96–192 AUs, depending on the nest predation scenario), which can boost the potential for recolonization following catastrophic events.

While the South Central RPU is facing higher levels of road mortality and nest predation than the North Central and Great Plains RPUs, it also has the highest number of healthy populations (40–174 AUs) across the range within the near term and contains several large populations. Suitable habitat is expected to remain well-distributed across the RPU. The potential for recolonization following catastrophic events is expected to be reduced, but still present for this RPU, even under the high nest predation scenario. However, the number of healthy populations has decreased compared to historical levels, given a high annual percentage of road mortality (7.4 percent on average), and high nest predation rates may be common. The New England and New York RPUs are also currently experiencing high amounts of road mortality which is anticipated to result in a near term loss of resiliency, redundancy, and representation within these two RPUs.

Overall, while the Blanding's turtle faces impacts from nest predation, road mortality, and other threats, multiple healthy populations remain extant in all RPUs across the range of the species, with the highest number in the North Central, Great Plains and South Central RPUs. Thus, the species retains genetic and environmental representation. Though species redundancy and population resiliency are reduced as compared to historical condition, the Blanding's turtle currently retains the ability to withstand demographic stochasticity and catastrophic events. Thus, given the number of healthy AUs within each RPU across the range, in the near term, these threats are not of such a magnitude that the species is in danger of extinction.

However, we project that the magnitude of threats will continue to increase into the foreseeable future. As discussed in *Future Conditions*, we consider the foreseeable future for this species to be approximately until the year 2100. This is the timeframe over

which we could reliably project how future changes in temperature and precipitation will impact habitat suitability and how the species will respond to these threats. It also represents approximately three generations of Blanding's turtles, which allowed us to estimate the demographic response to the threat of road mortality over a meaningful timeframe for the species. In the foreseeable future, we project that the Blanding's turtle will experience additional declines as the species responds to ongoing road mortality and habitat loss due to temperature, precipitation, and land use changes. Over the next two generations, we anticipate losses of resiliency, redundancy, and representation in the Great Plains RPU, and additional loss of resiliency, redundancy, and representation in the New England, New York, and South Central RPUs. Declines in the Great Plains RPU are projected to be driven by limitations in suitable habitat, with 54 percent (40) of AUs projected to be impacted. Near complete loss of ecologically significant units in the New England RPU and in the New York RPU could occur within three generations, and increasing fragmentation in those RPUs will further reduce the species' viability. While healthy populations are projected to remain over the next three generations within the South Central, North Central, and Great Plains RPUs, these populations account for a relatively small percentage of the total AUs in each RPU. Though the North Central RPU may experience an increase in healthy populations over the next two generations, the number of healthy populations will decline at late century. In the New York RPU, five AUs at most (≤ 8 percent) are expected to remain healthy, and in the New England RPU, only one to three AUs (≤ 1 percent) are projected to remain healthy.

By mid-century, we project the Blanding's turtle will experience a 22–32 percent reduction in suitable habitat rangewide, and we project that by late century, the species will experience a 37–63 percent reduction in suitable habitat. Though we have limited information about populations in Canada, we expect that they will also continue to face increasing threats into the foreseeable future. Given current road mortality levels and

projected habitat suitability at late century, we estimate that only 4–21 percent (72–380) of AUs in the United States will remain healthy after three generations.

As a result of these declines, within the foreseeable future we anticipate loss of important genetic resources and diminished ability for the species to withstand catastrophic events like drought, unauthorized collection for the pet trade, or disease. These results indicate that an irretrievable loss of adaptive capacity is likely to occur, particularly in the Northeast, and that the Blanding's turtle's ability to withstand stochasticity, changing conditions, and catastrophes may be substantially compromised in three RPUs in the future as early as mid-century, even under the lowest future change scenario. In addition, decreased connectivity between remaining populations will make the species less likely to recover from stochastic and catastrophic events.

After evaluating threats to the species and assessing the cumulative effect of the threats under the Act's section 4(a)(1) factors, we find that though the Blanding's turtle has had a decrease in viability compared to historical condition, the species maintains redundancy and representation across its range and has enough resilient populations in the Great Plains, North Central, and South Central RPUs such that the species is not currently in danger of extinction throughout all of its range. However, within the foreseeable future, the effects of habitat loss and fragmentation, road mortality, nest predation, and increasing temperatures and changing precipitation patterns are expected to increase such that resiliency, redundancy, and representation will be substantially reduced. Thus, after assessing the best scientific and commercial data available, we conclude that the Blanding's turtle is not in danger of extinction but is likely to become in danger of extinction within the foreseeable future throughout all of its range.

Status Throughout a Significant Portion of Its Range

Under the Act and our regulations, a species may warrant listing if it is in danger of extinction or likely to become so within the foreseeable future throughout all or a

significant portion of its range. The court in *Center for Biological Diversity* v. *Everson*, 435 F. Supp. 3d 69 (D.D.C. 2020) (*Everson*) vacated the provision of the Services' 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" (hereafter "Final Policy"; 79 FR 37578, July 1, 2014) that provided 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.

Therefore, we proceed to evaluating whether the species is endangered throughout a significant portion of its range—that is, whether there is any portion of the species' range for which both (1) the portion is "significant"; and (2) the species is in danger of extinction in that portion. We can choose to address either question first. Regardless of which question we address first, if we reach a negative answer with respect to the first question that we address, we do not need to evaluate the other question for that portion of the species' range.

Following the court's holding in *Everson*, we now consider whether the species is in danger of extinction throughout a significant portion of its range. In undertaking this analysis for the Blanding's turtle, we began by identifying portions of the range where the biological status of the species may be different from its biological status elsewhere in its range.

The range of a species can theoretically be divided in an infinite number of ways. For the SSA report and this final rule, we first grouped the species into AUs based on which groups of Blanding's turtles are likely to interact and breed. We further delineated the AUs into RPUs for based on genetic, phenotypic, and ecological differences, as well as geographic separation. We also analyzed how threats and species condition vary in each RPU rather than in each AU. Therefore, we found the RPU scale to be most appropriate scale for the Blanding's turtle for this analysis.

We examined the following threats: habitat loss, road mortality, increased predation, increasing temperatures and changing precipitation patterns, unauthorized collection, disease, and pollution, including cumulative effects.

We found one biologically meaningful portion of the Blanding's turtle's range where the biological condition of the species differs from its condition elsewhere in its range such that the regulatory status of the species in that portion may differ from the rest of the species' range (e.g., where the species might be in danger of extinction). Our analysis indicates that the populations in the New York and New England RPUs are declining such that the Blanding's turtle may be in danger of extinction in this portion of the range. These RPUs have experienced the greatest loss of populations compared to historical condition, with only 2–6 populations in the New York RPU and 8–9 populations in the New England RPUs. They are also experiencing high levels of road mortality and nest predation. Though the South Central RPU is also currently experiencing high levels of road mortality and nest predation, it still has multiple populations distributed across the RPU (40–174 populations), including several large, healthy populations.

After identifying a portion (New York and New England RPUs) with a potentially different status than the remainder of the range (in other words, a portion of the range where the species *may* be in danger of extinction), we considered whether or not the portion is a "significant portion of the range" of the Blanding's turtle. The Service's most recent definition of "significant" within the Final Policy has been invalidated by court order (see *Desert Survivors* v. *U.S. Department of the Interior*, 321 F. Supp. 3d 1011, 1070-74 (N.D. Cal. 2018)). Therefore, in light of the court decision, for the purposes of this analysis when considering whether this portion is significant, we considered whether the portion may (1) occur in a unique habitat or ecoregion for the species; (2) contain

high-quality or high-value habitat relative to the rest of the range; or (3) contain a large geographic proportion of the suitable habitat for the species.

Collectively, these two units make up 4.6 percent of the Blanding's turtle range. They do not contain high-quality or high-value habitat relative to the remainder of the range. They also do not contain any unique or unusual habitat for the taxon. In consideration of those factors, we concluded that this portion is not a significant portion of the range.

As a result of our finding that this portion of the range is not "significant," we do not need to determine whether the Blanding's turtle is in danger of extinction throughout this portion of the range. Therefore, no portion of the species' range provides a basis for determining that the species is in danger of extinction throughout a significant portion of its range. This does not conflict with the courts' holdings in *Desert Survivors* v. *U.S. Department of the Interior*, 321 F. Supp. 3d 1011, 1070-74 (N.D. Cal. 2018) and *Center for Biological Diversity* v. *Jewell*, 248 F. Supp. 3d 946, 959 (D. Ariz. 2017) because, in reaching this conclusion, we did not apply the aspects of the Final Policy, including the definition of "significant" that those court decisions held to be invalid.

Determination of Status

Based on the best scientific and commercial data available, we determine that the Blanding's turtle meets the Act's definition of a threatened species because it is likely to become in danger of extinction within the foreseeable future throughout all of its range. Therefore, we propose to list the Blanding's turtle as a threatened species in accordance with sections 3(20) and 4(a)(1) of the Act.

Available Conservation Measures

Conservation measures provided to species listed as endangered or threatened species under the Act include recognition as a listed species, planning and implementation of recovery actions, requirements for Federal protection, and prohibitions

against certain practices. Recognition through listing results in public awareness and conservation by Federal, State, Tribal, and local agencies, foreign governments, 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 directs us to develop and implement recovery plans for the conservation and survival of endangered and threatened species unless we determine that such a plan will not promote the conservation of the species. Under section 4(f)(1)(B)(ii), recovery plans must, to the maximum extent practicable, include objective, measurable criteria which, when met, would result in a determination, in accordance with the provisions of section 4 of the Act, that the species be removed from the Lists of Endangered and Threatened Wildlife and Plants.

Recovery plans provide a roadmap for us and our partners on methods of enhancing conservation and minimizing threats to listed species, as well as measurable criteria against which to evaluate progress towards recovery and assess the species' likely future condition. However, they are not regulatory documents and do not substitute for the determinations and promulgation of regulations required under section 4(a)(1) of the Act. A decision to revise the status of a species, or to delist a species, is ultimately based on an analysis of the best scientific and commercial data available to determine whether a species is no longer an endangered species or a threatened species, regardless of whether that information differs from the recovery plan.

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 and other experts, including those from Federal and State agencies, Tribes, the academic community, or nongovernmental organizations) may be established to develop or implement recovery plans. 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 Illinois–Iowa 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 ranges may occur primarily or solely on non-Federal lands. Recovery of these species requires cooperative conservation efforts on private, State, and Tribal lands.

If this species is listed, funding for recovery actions may be available from a variety of sources, including Federal budgets, State programs, and cost-share grants for non-Federal landowners, the academic community, and nongovernmental organizations. In addition, pursuant to section 6 of the Act, the States of Illinois, Indiana, Iowa, Maine, Massachusetts, Michigan, Minnesota, Missouri, Nebraska, New Hampshire, New York, Ohio, Pennsylvania, and Wisconsin would be eligible for Federal funds to implement management actions that promote the protection or recovery of the Blanding's turtle.

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

Section 7 of the Act is titled, "Interagency Cooperation," and it 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 destroy 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) of the Act.

Examples of discretionary actions for the Blanding's turtle that may be subject to conference and consultation procedures under section 7 of the Act are management of Federal lands administered by the Service (national wildlife refuges), U.S. Forest Service, National Park Service, and Department of War (DoW) installations, as well as actions 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 actions funded by Federal agencies such as the Natural Resources Conservation Service, 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 Illinois–Iowa Ecological Services Field Office (see **FOR FURTHER INFORMATION CONTACT**) with any specific questions on section 7 consultation and conference requirements.

Section 9 of the Act provides a specific list of prohibitions for endangered species but does not provide these same prohibitions for threatened species. Instead, pursuant to section 4(d) of the Act, for any species listed as a threatened species, the Secretary must issue protective regulations that are "necessary and advisable to provide for the conservation of such species" (these are referred to as "4(d) rules"). Additional measures

for the Blanding's turtle are described below (see **Protective Regulations Under Section 4(d) of the Act**, below).

We may issue permits to carry out otherwise prohibited activities involving threatened wildlife under certain circumstances. Regulations governing permits for threatened wildlife are codified at 50 CFR 17.32, and general Service permitting regulations are codified at 50 CFR part 13. With regard to threatened 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.

II. Protective Regulations Under Section 4(d) of the Act

Background

As discussed in **Available Conservation Measures**, section 9 of the Act provides a specific list of prohibitions for endangered species but does not provide these same prohibitions for threatened species. Instead, pursuant to section 4(d) of the Act, for any species listed as a threatened species, the Secretary must issue protective regulations that are "necessary and advisable to provide for the conservation of such species." Section 4(d) of the Act contains two sentences. The first sentence states that the Secretary shall issue such regulations as they deem necessary and advisable to provide for the conservation of species listed as threatened species. Conservation is defined in the Act to mean the use of all methods and procedures which are necessary to bring any endangered species or threatened species to the point at which the measures provided pursuant to the Act are no longer necessary. Additionally, the second sentence of section 4(d) of the Act states that the Secretary may by regulation prohibit with respect to any threatened species any act prohibited under section 9(a)(1), in the case of fish or wildlife, or section 9(a)(2), in the case of plants. With these two sentences in section 4(d), Congress delegated broad

authority to the Secretary to determine what protections would be necessary and advisable to provide for the conservation of threatened species.

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

Under our section 4(d) authorities, we put in place protections intended to both prevent a threatened species from becoming an endangered species and to promote its recovery. Section 4(d) rules explain what is prohibited for a threatened species, thus making the activity unlawful without a permit or authorization under the Act for the prohibited activity unless otherwise excepted in the 4(d) rule and may also include affirmative requirements. Section 4(d) rules are therefore directly related to what actions may require permits in the future. As discussed in **Available Conservation Measures**, permits may be issued for purposes described in our threatened species permitting regulations at 50 CFR 17.32, including for recovery actions, conservation benefit agreements (previously referred to as candidate conservation agreements with assurances

and safe harbor agreements), or HCPs. We may also except otherwise prohibited activities through a 4(d) rule itself, in which case threatened species permits would not be required for those activities. For example, there are two categories of exceptions that we frequently include in 4(d) rules, and these are for otherwise prohibited acts or forms or amounts of "take" that are: (1) unavoidable while conducting beneficial actions for the species, or (2) considered inconsequential (de minimis) to the conservation of the species. For otherwise prohibited take or activities that require permits under section 10 of the Act, programmatic approaches—such as general conservation plans and template habitat conservation plans—may be available as another way for project proponents to comply with prohibitions or requirements applicable to one or more species while reducing the time that would otherwise be associated with developing individual permit applications. In addition, the Service and project proponents can reduce the need for such permits by developing standardized conservation measures that avoid the risk of "take."

The provisions of this species' proposed protective regulations under section 4(d) of the Act are one of many tools that we would use to promote the conservation of the Blanding's turtle. The proposed protective regulations would apply only if and when we make final the listing of the Blanding's turtle as a threatened species and finalize the 4(d) rule. Nothing in 4(d) rules changes in any way the recovery planning provisions of section 4(f) of the Act or the consultation requirements under section 7 of the Act. As mentioned above under **Available Conservation Measures**, section 7(a)(2) of the Act requires Federal agencies, including the Service, to ensure that any action they authorize, fund, or carry out is not likely to jeopardize the continued existence of any endangered species or threatened species or result in the destruction or adverse modification of designated critical habitat of such species. In addition, even before the listing of any species or the designation of its critical habitat is finalized, 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 critical habitat proposed to be designated for such species. These requirements are the same for a threatened species regardless of what is included in its 4(d) rule.

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

At the end of a formal consultation, the Service issues a biological opinion, containing its determination as to whether the Federal action is likely to jeopardize the continued existence of a listed species or result in the destruction or adverse modification of critical habitat (a "jeopardy" biological opinion) (50 CFR 402.14(h)). If the Service determines in its biological opinion that the action is likely to jeopardize listed species or destroy or adversely modify critical habitat, it shall include reasonable and prudent alternatives, if any exist, it believes would avoid the likelihood of jeopardy or destruction or adverse modification (50 CFR 402.14(h)). In accordance with 50 CFR 402.14(i), when there is a "no jeopardy" biological opinion but "take" of a listed species is reasonably certain to occur, the Service is required to issue an incidental take statement that specifies those reasonable and prudent measures (RPMs) the Service considers necessary or appropriate to minimize the impact of the incidental take and terms and conditions (TCs)

that must be complied with to implement those measures. These requirements exist regardless of what is included in a 4(d) rule. However, we recognize that whether or not take associated with certain activities is prohibited by a 4(d) rule may be relevant to our consideration of the extent of RPMs we may consider necessary or appropriate. In most situations, we would not consider RPMs necessary or appropriate to minimize the impact of take that is not prohibited or that is excepted by a 4(d) rule. Regardless, the RPMs/TCs cannot alter the basic design, location, scope, duration, or timing of the action and may involve only minor changes (50 CFR 402.14(i)(2)). They should not prevent the action subject to consultation from proceeding as essentially proposed (89 FR 24268, April 5, 2024).

Because consultation obligations and processes are unaffected by 4(d) rules, we may consider developing tools to streamline future intra-Service and interagency consultations for actions that result in forms of take that are not prohibited by the 4(d) rule (but that still require consultation). These tools may include consultation guidance, online consultation processes via the Service's digital project planning tool (Information for Planning and Consultation; https://ipac.ecosphere.fws.gov/), template language for biological opinions, or programmatic consultations.

Provisions of the Proposed 4(d) Rule

Exercising the Secretary's authority under section 4(d) of the Act, we have developed a proposed rule that is designed to address the Blanding's turtle's conservation needs. Section 4(d) requires the Secretary to issue such regulations as they deem necessary and advisable to provide for the conservation of each threatened species and authorizes the Secretary to include among those protective regulations any of the prohibitions that section 9(a)(1) of the Act prescribes for endangered species (*In re: Polar Bear Endangered Species Act Listing and 4(d) Rule Litigation*, 818 F. Supp. 2d 214, 228 (D.D.C. 2011) *(citing Sweet Home Chapter of Cmtys. for a Great Or.* v. *Babbitt,*

1 F.3d 1, 8 (D.C. Cir. 1993), *rev'd on other grounds,* 515 U.S. 687 (1995))). Our necessary and advisable determination includes consideration of conservation and economic impacts *(Kansas Natural Resources Coalition, et al.* v. *USFWS, et al.,* 780 F. Supp. 3d 650 (W.D. Tex. 2025)) (hereafter "*Kansas*") (see also 91 FR 45723, July 21, 2026). We explain below why we find that, if finalized, the prohibitions and exceptions in this proposed rule as a whole satisfy the requirement in section 4(d) of the Act to issue regulations deemed necessary and advisable to provide for the conservation of the Blanding's turtle.

As discussed above under **Summary of Biological Status and Threats**, we have concluded that the Blanding's turtle is likely to become in danger of extinction within the foreseeable future primarily due to habitat loss, road mortality, increased predation, increasing temperatures and changing precipitation patterns, unauthorized collection, and pollution. In addition, there is demand for the Blanding's turtle in the pet trade. Therefore, prohibiting take, and activities associated with import, export, trade, commerce, and sale is intended to help prevent further collections from the wild, that could result in population-level impacts to the species.

The protective regulations we are proposing for the Blanding's turtle incorporate prohibitions from section 9(a)(1) to address the threats to the species. We propose to include the following prohibitions of section 9(a)(1) of the Act, and implementing regulations codified at 50 CFR 17.21, which make it illegal for any person subject to the jurisdiction of the United States to commit, to attempt to commit, to solicit another to commit or to cause to be committed any of the following acts with regard to any endangered wildlife: (1) import into, or export from, the United States; (2) take (which includes harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct) within the United States, within the territorial sea of the United States, or on the high seas; (3) possess, sell, deliver, carry, transport, or

ship, by any means whatsoever, any such wildlife that has been taken illegally; (4) deliver, receive, carry, transport, or ship in interstate or foreign commerce, by any means whatsoever and in the course of commercial activity; or (5) sell or offer for sale in interstate or foreign commerce. This protective regulation includes these prohibitions because the Blanding's turtle likely to become in danger of extinction within the foreseeable future and putting these prohibitions into place is intended to prevent further declines, preserve the species' remaining populations, slow its rate of decline, and decrease synergistic, negative effects from other ongoing or future threats.

Under the Act, "take" means to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct. Harass has been further defined in regulations at 50 CFR 17.3. Take can result knowingly or otherwise, intentionally or incidentally. Regulating take is intended to help preserve the species' remaining populations, slow their rate of decline, and decrease cumulative effects from other ongoing or future threats. Therefore, we propose to prohibit take of the Blanding's turtle, except for take resulting from those actions and activities specifically excepted by the 4(d) rule.

The proposed 4(d) rule would also provide for the conservation of the species by allowing exceptions that are intended to incentivize conservation actions or actions that are not expected to rise to the level that would have a negative impact (i.e., would have only de minimis impacts) on the species' conservation. Exceptions to the prohibitions include the exceptions to the prohibition for endangered wildlife, as set forth in 50 CFR 17.21(c)(2)–(4) and (d)(2), and exceptions for threatened wildlife at 50 CFR 17.31(c). This includes allowing law enforcement to possess and conduct other acts with illegally taken Blanding's turtles.

To further the conservation of the species, any employee or agent of the Service, any other Federal land management agency, the National Marine Fisheries Service, a

State conservation agency, or a federally recognized Tribe, who is designated by their agency or Tribe for such purposes, may, when acting in the course of their official duties, take threatened wildlife without a permit if such action is necessary to: (i) aid a sick, injured, or orphaned specimen; or (ii) dispose of a dead specimen; or (iii) salvage a dead specimen that may be useful for scientific study; or (iv) remove specimens that constitute a demonstrable but nonimmediate threat to human safety, provided that the taking is done in a humane manner. Such taking may involve killing or injuring only if it has not been reasonably possible to eliminate such threat by live capturing and releasing the specimen unharmed, in an appropriate area. Any taking must be reported in writing to the Office of Law Enforcement, via contact methods listed at https://www.fws.gov, within 5 calendar days. The specimen may only be retained, disposed of, or salvaged under directions from the Office of Law Enforcement.

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

In addition, any employee or agent of the Service or of the National Marine Fisheries Service, who is designated by their agency for such purposes, may, when acting in the course of their official duties, take the Blanding's turtle.

The proposed 4(d) rule would also provide for the conservation of the species by including additional exceptions that are intended to incentivize conservation actions or that, while they may have some minimal level of take of the Blanding's turtle, are not expected to rise to the level that would have a negative impact (i.e., would have only de minimis impacts) on the species' conservation. The proposed additional exceptions to prohibitions include (1) possession and handling of unlawfully taken Blanding's turtles by State-licensed wildlife rehabilitators, zoos, and aquariums;

(2) take associated with individuals moving the turtles out of the path of vehicles or heavy machinery; (3) for a period of 1 year from the effective date of this rule, purposeful take associated with conducting research for the Blanding's turtle. These activities are expected to have negligible impacts to the Blanding's turtle.

The first activity is related to possession of unlawfully taken Blanding's turtles by State-licensed wildlife rehabilitation facilities, zoos, and aquariums. These organizations may provide medical care or housing for abandoned Blanding's turtles or for those confiscated by law enforcement and may also hold Blanding's turtles unfit for release for educational or exhibition purposes.

The second activity is associated with an individual moving a turtle that is in the path of an automobile or other heavy machinery. Moving turtles out of the path of automobiles and heavy machinery to a safe location in the immediate vicinity is considered beneficial in preventing fatalities of all age classes of Blanding's turtle.

The third activity, for a limited period of 1 year from the effective date of the final rule, we propose to incentivize conservation for the Blanding's turtle related to research activities. This proposed exception is intended to promote and encourage the gathering of

information that would help conserve and recover the Blanding's turtle. This proposed exception would apply only to those individuals permitted to conduct these same activities by the State wildlife agencies in the States in which the activities will be conducted. The rationale for this limited time period is that a final listing decision and associated 4(d) rule may become effective in the middle of the Blanding's turtle field season, and it would be difficult to amend all permits in time. After 1 year following the effective date of the final 4(d) rule, a permit pursuant to section 10(a)(1)(A) of the Act would be required for these conservation and research activities for the Blanding's turtles.

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

Additionally, we recognize that certain actions promote or are inconsequential to the conservation of the species. These include activities associated with conducting conservation and restoration efforts for Blanding's turtles when implementing State-approved best management practices (BMPs); routine agricultural activities; and forestry practices that implement Federal or State-approved forestry BMPs. If these activities are subsequently determined to result in incidental take of Blanding's turtle, such take is excepted from the prohibitions under section 9 of the Endangered Species Act that are made applicable to Blanding's turtle by this rule.

We recognize that certain conservation and restoration efforts benefit Blanding's turtles, including creating, restoring, and maintaining Blanding's turtle nesting or wetland habitat, installing fencing to reduce road mortality, and mechanically controlling invasive plants and removing woody vegetation to improve habitat connectivity and nesting habitat. For example, restoration efforts include implementation of conservation practices and associated BMPs by the Natural Resources Conservation Service for Blanding's turtle as described for the Northeast Turtles and Blanding's Turtles Working Land for Wildlife programs, as well as conservation efforts for Blanding's turtles described in current DoW integrated natural resources management plans or implementation of Blanding's turtle BMPs by the Partners for Amphibian and Reptile Conservation partnership program (DoW Partners in Amphibian and Reptile Conservation 2019).

This activity includes wetland/stream restoration activities, provided that State-approved BMPs (many of which have been developed specifically for the Blanding's turtle) are implemented. Proper implementation of these BMPs will help conserve the Blanding's turtle by avoiding and/or minimizing impacts in areas that support Blanding's turtles.

For wetland and stream restoration for Blanding's turtles, activities can include but are not limited to wetland excavation, berm creation, grading, removing drain tile, filling drainage ditches, installing water control structures, and stream bank stabilization when implementing BMPs developed by the States. These activities would encourage Blanding's turtle conservation through creation and enhancement of habitat, while avoiding and minimizing impacts to the extent practicable through the implementation of BMPs.

Activities that are conducted during the continuation of routine agricultural practices, as specified below, on cultivated lands that are in row crop, seed-drilled untilled crop, hay, or forage production are inconsequential to the conservation of the

Blanding's turtle. Impacts are inconsequential when these lands meet the definition of cropland as defined in 7 CFR 718.2, and, in addition, have been cultivated, meaning tilled, planted, or harvested, within the 5 years preceding the proposed routine agricultural practice..

Routine agricultural activities include:

(a) Plowing, drilling, disking, mowing, or other mechanical manipulation and management of lands.

(b) Routine activities in direct support of cultivated agriculture, including replacement, upgrades, maintenance, and operation of existing infrastructure such as buildings, irrigation conveyance structures, fences, and roads.

While Blanding's turtles may traverse agricultural fields as they move among wetlands and females may occasionally use these areas opportunistically as nesting sites, these lands generally do not provide the habitat necessary to support the full suite of life history functions of the species.

Forest management that implements Federal or State-approved forestry BMPs. Forest landowners who properly implement these BMPs are helping conserve the Blanding's turtle.

Forestry operations are widely implemented in accordance with industry and State-approved BMPs (Cristan et al. 2018, entire), and that adherence to these BMPs broadly preserves water quality standards, particularly related to sedimentation (Cristan et al. 2016, entire; Warrington et al. 2017, entire). Proper implementation of these BMPs will help conserve the Blanding's turtle.The 4(d) rule provides for the conservation of the Blanding's turtle because it would regulate take and activities that pose a threat to the species or that may become a threat in the future. However, it also helps to incentivize conservation actions for several activities that are expected to have negligible impacts to the Blanding's turtle, as discussed above.

We considered the economic impacts of the implementation of the 4(d) rule. We found that there may be costs associated with the regulation of Blanding's turtles related to the pet trade, primarily a select set of reptile breeders and dealers that engage in commercial activities (e.g., interstate commerce, export) with Blanding's turtles. However, these activities are already regulated to some extent in a number of States within the species' range, indicating both the importance of regulating these activities and a limited economic impact where these activities are already regulated. Please see our November 2026 "Consideration of Economic Impacts for the 4(d) Rule for the Blanding's Turtle" on https://www.regulations.gov for our consideration of economic impacts. After consideration of the conservation and economic impacts of the 4(d) rule, and based on the best scientific and commercial data, we have determined that the 4(d) rule is necessary and advisable to provide for the conservation of the species. We appreciate public comment on the conservation and economic impacts of the proposed 4(d) rule.

III. Critical Habitat

Background

Section 4(a)(3) of the Act requires that, to the maximum extent prudent and determinable, we designate a species' critical habitat concurrently with listing the species. Critical habitat is defined in section 3(5)(A) 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(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 each Federal action agency ensure, in consultation with the Service, that any action they authorize, fund, or carry out is not likely to result in the destruction or adverse modification of designated critical habitat. The designation of critical habitat does not affect land ownership or establish a refuge, wilderness, reserve, preserve, or other conservation area. Such designation also does not allow the government or public to access private lands. Such designation does not require implementation of restoration, recovery, or enhancement measures by non-Federal landowners. Rather, designation requires that, where a landowner requests Federal agency funding or authorization for an

action that may affect an area designated as critical habitat, the Federal agency consult with the Service under section 7(a)(2) of the Act. If the action may affect the listed species itself (such as for occupied critical habitat), the Federal 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 listed 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 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(b)(2) 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 compiled in 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.

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, would continue to be subject to: (1) conservation actions implemented under section 7(a)(1) of the Act; (2) regulatory protections afforded by the requirement in section 7(a)(2) of the Act for Federal agencies to ensure their actions are not likely to jeopardize the continued existence of any endangered or threatened species; and (3) the prohibitions found in the 4(d) rule. 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 scientific data available at the time of designation will not control the direction and substance of future recovery plans, HCPs, or other species conservation

planning efforts if new information available at the time of those planning efforts calls for a different outcome.

Not Prudent Determination

Section 4(a)(3) of the Act, as amended, and our regulations (50 CFR 424.12) require that, to the maximum extent prudent and determinable, the Secretary shall designate critical habitat at the time the species is determined to be an endangered species or a threatened species. Our regulations (50 CFR 424.12(a)(1)) state that designation of critical habitat may not be prudent in circumstances such as, but not limited to, the following:

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

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

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

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

Consistent with our regulations, we have determined that the Blanding's turtle is threatened by taking or other human activity and identification of critical habitat can be expected to increase the degree of such threat to it. We recognize that critical habitat designations may provide conservation benefits for listed species, including the Blanding's turtle, and can help guide recovery planning and resource management. Critical habitat protections apply where Federal actions are involved during section 7 consultations. As discussed in **Conservation Measures,** 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 result in the destruction or adverse

modification of designated critical habitat. These consultations with Federal agencies and applicants provide education and awareness of the importance of certain areas and may help ensure that important habitat areas are conserved over time. Critical habitat designation could provide conservation benefits by requiring Federal agencies to evaluate and minimize impacts to areas during section 7 consultations. However, if the Blanding's turtle is listed under the Act, Federal agencies will already be required to consult with the Service wherever the species may be present to ensure that any action they authorize, fund, or carry out is not likely to jeopardize the continued existence of the species. In addition, the Service can communicate directly with Federal agencies and landowners and establish agreements and protections for listed species, such as the Blanding's turtle, regardless of critical habitat designation. Any potential benefits of critical habitat designation must be considered in light of the anticipated risks to the species resulting from identifying specific habitat areas. In the case of the Blanding's turtle, the publication of detailed maps and descriptions would reveal the precise locations of vulnerable populations. Because collection has been identified as an existing and ongoing threat to the species, increasing availability of specific location information would elevate that risk. The factors described below further discuss the harm associated with publicly disclosing precise habitat locations. The potential benefits of critical habitat designation do not overcome the risks to the species anticipated from disclosure of exact habitat locations that would facilitate collection.

As discussed earlier in the proposed listing determination for the Blanding's turtle, there is currently an imminent threat of collection identified under Factor B for this species. Identification and mapping of critical habitat is expected to facilitate any such threat because it necessitates the publication of maps and a narrative description of specific critical habitat areas in the *Federal Register*. The degree of detail in those maps and boundary descriptions is greater than the general location descriptions provided in the

SSA report and this proposal to list the Blanding's turtle as a threatened species. Designation of critical habitat would more widely announce the exact locations of Blanding's turtles to collectors, and the publication of maps and descriptions outlining the locations of the Blanding's turtle would further facilitate unauthorized collection and trade, as collectors would know the exact locations where Blanding's turtles occur.

Collection of wild Blanding's turtles is occurring throughout the species' range, and similar to what has been observed in other turtle species, these turtles are likely destined for the international pet trade in Southeast Asia. Illegal collection has been documented in Michigan, Minnesota, Indiana, Ohio, New York, and Ontario; and there is evidence of Blanding's turtle collection across the species' range (CITES 2013, p. 7). The U.S. Fish and Wildlife Service Office of Law Enforcement has been involved in three cases of illegal Blanding's turtle collection (Grace et al. 2024, pers. comm.). Since 1996, the Michigan Department of Natural Resources Law Enforcement Division has recorded 22 incidents of illegal Blanding's turtle collection in Michigan (Rendi 2024, pers. comm.). A large population in southeastern Minnesota has declined from an estimated 2,500–4,600 adults to an estimated 1,000–2,760 adults (40–60 percent) over the last 15–20 years due to illegal collection and road mortality (Pappas 2023, pers. comm.). Collection for the pet, food, and traditional medicine trades in Canada and abroad is one of the main threats to Blanding's turtle populations in Canada (COSEWIC 2016, p. 39).

Turtles in general are highly sought after by collectors in the illegal animal trade. Therefore, publishing specific location information would provide a high level of assurance that any person going to a specific location would be able to successfully locate and collect Blanding's turtles, given the species' site fidelity and ease of capture once located. Identification of locations of populations through publication of a critical habitat designation for the Blanding's turtle can be expected to increase the degree of collection threat to the species.

Moreover, as species become rarer and more difficult to obtain, the monetary value increases, thus driving increased collection pressure on remaining wild individuals. We anticipate that listing the Blanding's turtle under the Act may promote further interest in black market sales of the turtles and increase the likelihood that the species will be sought out for the pet trade as demand rises.

As discussed in our final rule related to critical habitat exclusions (91 FR 45662 at 45664, July 21, 2026), section 4(b)(2) of the Act applies to designations of critical habitat and decisions as to whether certain areas of critical habitat should be excluded from the designation. It is a separate analysis from the analysis we conduct when determining whether critical habitat is prudent in the first instance. Though sections 4(a)(3) and 4(b)(2) cross-reference each other, their functions are distinct: section 4(a)(3) provides that (unless the Secretary determines that designating critical habitat is not prudent) critical habitat must be designated in accordance with 4(b) and reinforces the timeline (i.e., concurrently with listing) of designating critical habitat.

As the court holdings in *Natural Resources Defense Council* v. *U.S. Dep't of the Interior*, 113 F.3d at 1125 (9th Cir. 1997), *Conservation Council of Hawaii* v. *Babbitt*, 2 F. Supp. 2d at 1287-88 (D. Hawaii 1998), and *Center for Biological Diversity and Healthy Gulf* v. *U.S. Fish and Wildlife Service* at 792 F. Supp. 3d at 66 (D.D.C. 2025) demonstrate, when considering whether a designation of critical habitat is not prudent, the Service must take into account the specific factual circumstances at issue for each species, including consideration of the risks and benefits that a critical habitat designation would provide. However, this does not require the Service to engage in the type of area-by-area weighing process that applies under section 4(b)(2) of the Act when we are deciding whether to exclude a specific area from a critical habitat designation. Here we considered the anticipated benefits and risks to the Blanding's turtle from a potential critical habitat designation.

In conclusion, as provided for in section 4(a)(3)(A) of the Act, we find that the designation of critical habitat for the Blanding's turtle is not prudent, because the Blanding's turtle faces a documented threat of unauthorized collection and trade, and designation can reasonably be expected to increase the degree of these threats to the species.

Required Determinations

Clarity of the Rule

We are required by Executive Orders (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 14192)

E.O. 12866 provides that the Office of Information and Regulatory Affairs (OIRA) in the Office of Management and Budget will review all significant rules. E.O. 13563 reaffirms the principles of E.O. 12866 while calling for improvements in the Nation's regulatory system to promote predictability, to reduce uncertainty, and to use the best, most innovative, and least burdensome tools for achieving regulatory ends. E.O.

13653 directs agencies to consider regulatory approaches that reduce burdens and maintain flexibility and freedom of choice for the public where these approaches are relevant, feasible, and consistent with regulatory objectives. We have developed this proposed rule in a manner consistent with these requirements. OIRA has determined that this rule is significant. This rule is an E.O. 14192 regulatory action.

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; title II of Pub. L. 104–121, March 29, 1996), 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.

While we do not conduct RFA analyses on our classification determinations under the Act, in accordance with recent caselaw (*Kansas*), we comply with RFA when promulgating 4(d) rules. 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. Some of the actions regulated by the proposed 4(d) rule are likely to involve Federal action agencies. 4(d) rules do not alter any obligations for Federal agencies under section 7 of the Act. Federal agencies, in consultation with the

Service, are required to ensure that any action authorized, funded, or carried out by the agency is not likely to jeopardize the continued existence of a listed species or result in the destruction or adverse modification of designated critical habitat. Therefore, under section 7, only Federal action agencies are directly subject to those specific regulatory requirements. Consequently, it is our position that only Federal action agencies would be directly regulated during any potential future section 7 consultations (regardless of what is prohibited in 4(d) rules). The RFA does not require evaluation of the potential impacts to entities not directly regulated. Moreover, Federal agencies are not small entities. Therefore, we do not consider potential impacts to Federal agencies or associated with any potential future section 7 consultations here.

This proposed 4(d) rule will likely have some impacts from prohibiting export, import, or interstate and foreign commerce without a permit under the Act. We also anticipate there may be some level of economic impact from prohibiting take or actions involving illegally taken wildlife. A small number of individuals or entities may incur costs associated with requesting permits for take associated with surveys or research activities. There may be costs associated with private landowners, Tribes, local governments, or States voluntarily amending existing section 10(a)(1)(B) permits to include Blanding's turtles, or that choose to develop new HCPs and apply for permits. However, we do not have an estimate of how many landowners may pursue these options or what those associated costs may be.

This proposed 4(d) rule will likely have some level of impact on certain small entities, primarily a select set of reptile breeders and dealers that trade the species, some small entities who voluntarily apply for incidental take permits associated with take of Blanding's turtle during otherwise lawful activities, and small entities requesting permits for purposeful take associated with conservation actions. The pet trade and commercial export sectors are anticipated to experience impacts because commercial practices

involving the species would be prohibited unless Endangered Species Act permits are obtained. However, these impacts are not anticipated to impact a substantial number of entities in any of these sectors. Small entities who require permits for purposeful take associated with scientific purposes or to enhance the propagation or survival of the species are anticipated to experience negligible (not significant) impacts.

We are seeking public comment (see **Information Requested**) regarding small entities that may be impacted from the proposed 4(d) rule. Please see our November 2026 "Consideration of Economic Impacts for the 4(d) Rule for the Blanding's Turtle" and initial regulatory flexibility analysis on https://www.regulations.gov for further consideration of impacts to small entities.

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

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

Government-to-Government Relationship with Tribes

In accordance with the President's memorandum of April 29, 1994 ("Government-to-Government Relations with Native American Tribal Governments;" 59 FR 22951, May 4, 1994), E.O. 13175 ("Consultation and Coordination with Indian Tribal Governments"), the President's memorandum of November 30, 2022 ("Uniform

Standards for Tribal Consultation;" 87 FR 74479, December 5, 2022), and the Department of the Interior's manual at 512 DM 2, we readily acknowledge our responsibility to communicate meaningfully with federally recognized Tribes and Alaska Native Corporations 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. We sent letters to all affected Tribes when we began developing our SSA report for the Blanding's turtle. We will continue to work with Tribal entities during the development of a final rule to list the Blanding's turtle.

References Cited

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

List of Subjects in 50 CFR Part 17

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

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 an entry for "Turtle, Blanding's" in alphabetical order under REPTILES to read as follows:

§ 17.11 Endangered and threatened wildlife.

* * * * *

(h) * * *

Common name	Scientific name	Where listed	Status	Listing citations and applicable rules
* * * * * * *				
REPTILES				
* * * * * * *				
Turtle, Blanding's	*Emydoidea blandingii*	Wherever found	T	[*Federal Register* citation when published as a final rule]; 50 CFR 17.42(s); [4d]
* * * * * * *				

3. Amend § 17.42 by adding a paragraph (s) to read as follows:

§ 17.42 Species-specific rules—reptiles.

* * * * *

(s) Blanding's turtle (*Emydoidea blandingii*).

(1) *Prohibitions.* The following prohibitions that apply to endangered wildlife also apply to the Blanding's turtle. Except as provided under paragraph (s)(2) of this section and §§ 17.4 and § 17.8, it is unlawful for any person subject to the jurisdiction of the United States to commit, to attempt to commit, to solicit another to commit, or cause to be committed, any of the following acts in regard to this species:

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

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

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

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

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

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

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

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

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

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

(v) Possess and engage in other acts with unlawfully taken wildlife, as follows: State-licensed wildlife rehabilitation facilities, zoos, and aquariums, providing medical care or housing for Blanding's turtles that have been abandoned or confiscated by law enforcement and holding Blanding's turtles that are unfit for release for educational or exhibition purposes.

(vi) If the activities identified in paragraph (vii) of this rule are subsequently determined to result in incidental take of Blanding's turtle, such take is excepted from the prohibitions under section 9 of the Endangered Species Act that are made applicable to Blanding's turtle by this rule.

(vii) Actions that promote or are inconsequential to the conservation of the species:

(A) Conservation and restoration efforts that benefit Blanding's turtles, which includes creating, restoring, and maintaining Blanding's turtle nesting or wetland habitat, installing fencing to reduce road mortality, and mechanically controlling invasive plants and removing woody vegetation to improve habitat connectivity and nesting habitat. These activities include wetland/stream restoration activities, provided that State-approved best management practices (BMPs) are implemented.

(B) Continuation of routine agricultural practices, as specified in paragraph (s)(2)(vi)(B)(*1*) and (*2*) of this section, on cultivated lands that are in row crop, seed-drilled untilled crop, hay, or forage production and, to the maximum extent practicable, equipment operators avoid conducting activities near known Blanding's turtle nests and adult Blanding's turtles. These lands must meet the definition of cropland as defined in 7 CFR 718.2 and must have been cultivated, meaning tilled, planted, or harvested, within the 5 years preceding the routine agricultural practice.. Routine agricultural activities include:

(*1*) Plowing, drilling, disking, mowing, or other mechanical manipulation and management of lands.

(*2*) Routine activities in direct support of cultivated agriculture, including replacement, upgrades, maintenance, and operation of existing infrastructure such as buildings, irrigation conveyance structures, fences, and roads.

(C) Forest management that implements Federal or State-approved forestry BMPs.

(viii) Take associated with:

(A) Any person moving a turtle that is in the path of an automobile or other heavy machinery.

(B) For individuals permitted to conduct research activities for the Blanding's turtle by the State wildlife agencies in the States in which the activities will be conducted: State-permitted research activities. Purposeful take associated with these activities is excepted until [DATE 1 YEAR AFTER THE EFFECTIVE DATE OF THE FINAL RULE]. After [DATE 1 YEAR AFTER THE EFFECTIVE DATE OF THE FINAL RULE], a permit pursuant to section 10(a)(1)(A) of the Act is required for these research activities for the Blanding's turtle.

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