DEPARTMENT OF THE INTERIOR

Fish and Wildlife Service

50 CFR Part 17

[Docket No. FWS–R3–ES–2024–0137; FXES1111090FEDR–256–FF09E21000]

RIN 1018–BE30

Endangered and Threatened Wildlife and Plants; Threatened Species Status With Section 4(d) Rule for Monarch Butterfly and Designation of Critical Habitat

AGENCY: Fish and Wildlife Service, Interior.

ACTION: Proposed rule.

SUMMARY: We, the U.S. Fish and Wildlife Service (Service), propose to list the monarch butterfly (*Danaus plexippus*), the iconic orange and black butterfly, as a threatened species and designate critical habitat under the Endangered Species Act of 1973, as amended (Act). We propose to list the monarch butterfly as a threatened species with protective regulations under section 4(d) of the Act (a ''4(d) rule''). Finalizing this rule as proposed would add this species to the List of Endangered and Threatened Wildlife and extend the Act's protections to the species. We also propose to designate critical habitat for the monarch butterfly under the Act. In total, approximately 4,395 acres (1,778 hectares) in Alameda, Marin, Monterey, San Luis Obispo, Santa Barbara, Santa Cruz, and Ventura Counties, California, fall within the boundaries of the proposed critical habitat designation. We also announce the availability of an economic analysis of the proposed designation of critical habitat for the monarch butterfly. We also are notifying the public that we have scheduled two informational meetings followed by public hearings on the proposed rule.

DATES: We will accept comments received or postmarked on or before March 12, 2025. 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.

Public informational meetings and public hearings: We will hold two public informational meetings followed by public hearings. The first meeting and hearing will be from 6 p.m. to 8:30 p.m., eastern time, on January 14, 2025. To accommodate those in western time zones, the second meeting and hearing will be from 8 p.m. to 10:30 p.m., eastern time, on January 15, 2025.

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

(1) *Electronically:* Go to the Federal eRulemaking Portal: *https://www.regulations.gov.* In the Search box, enter FWS–R3–ES–2024–0137, which is the docket number for this rulemaking. Then, click on the Search button. On the resulting page, in the panel on the left side of the screen, under the Document Type heading, check the Proposed Rule box to locate this document. You may submit a comment by clicking on ''Comment.''

(2) *By hard copy:* Submit by U.S. mail to: Public Comments Processing, Attn: FWS–R3–ES–2024–0137, U.S. Fish and Wildlife Service, MS: PRB/3W, 5275 Leesburg Pike, Falls Church, VA 22041–3803.

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

Availability of supporting materials: Supporting materials, such as the species status assessment report, are available at *https://www.regulations.gov* at Docket No. FWS–R3–ES–2024–0137. If we finalize the critical habitat designation, we will make the coordinates or plot points or both from which the maps are generated available at *https://www.regulations.gov* at Docket No. FWS–R3–ES–2024–0137.

Public informational meeting and public hearing: The public informational meeting and the public hearing will be held virtually using the Zoom platform. See Public Hearing, below, for more information.

FOR FURTHER INFORMATION CONTACT: Barbara Hosler, Regional Listing Coordinator, U.S. Fish and Wildlife Service, Midwest Region Headquarters, 5600 American Blvd., Bloomington, MN 55437, telephone 517–580–0254, email: *monarch@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. Please see Docket No. FWS–R3–ES–2024–0137 on *https://www.regulations.gov* for a document that summarizes this proposed rule.

SUPPLEMENTARY INFORMATION:

Executive Summary

Why we need to publish a rule. Under the Act, a species warrants listing if it meets the definition of an endangered species (in danger of extinction throughout all or a significant portion of its range) or a threatened species (likely to become 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 monarch butterfly meets the Act's definition of a threatened species; therefore, we are proposing to list it as such and proposing a designation of its critical habitat. Both listing a species as an endangered or threatened species and making a critical habitat designation 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 monarch butterfly as a threatened species to the List of Endangered and Threatened Wildlife with protective regulations under section 4(d) of the Act, and we propose the designation of critical habitat for the species.

The basis for our action. Under the Act, we may determine that a species is an endangered or threatened species because of any of five factors: (A) The present or threatened destruction, modification, or curtailment of its habitat or range; (B) overutilization for commercial, recreational, scientific, or educational purposes; (C) disease or predation; (D) the inadequacy of existing regulatory mechanisms; or (E) other natural or manmade factors affecting its continued existence. We have determined that the monarch butterfly meets the definition of a threatened species due to the following threats: the ongoing impacts from loss and degradation of breeding, migratory, and overwintering habitat (from past conversion of grasslands and shrublands to agriculture and widespread use of herbicides; logging/thinning at overwintering sites in Mexico; urban development, senescence (*i.e.,* deterioration with age), and incompatible management of overwintering sites in California; and drought) (Factor A); exposure to insecticides (Factor E); and effects of climate change (Factor E).

To improve future conditions so that the monarch migratory populations stabilize and grow, we need to (1)

achieve a significant increase in the availability of milkweed and nectar plants in monarch breeding and migratory areas; (2) protect and enhance overwintering habitat; (3) avoid and minimize impacts to monarchs and their habitat from insecticides and herbicides; and (4) maintain public support for the conservation of monarch butterflies. Because of the monarch butterfly's general habitat use and wide distribution, all sectors of society, including the general public, have an opportunity to participate in a broad range of conservation efforts throughout the species' range.

Section 4(a)(3) of the Act requires the Secretary of the Interior (Secretary), to the maximum extent prudent and determinable, concurrently with listing designate critical habitat for the species. Section 3(5)(A) of the Act defines critical habitat as (i) the specific areas within the geographical area occupied by the species, at the time it is listed, on which are found those physical or biological features (I) essential to the conservation of the species and (II) which may require special management considerations or protections; and (ii) specific areas outside the geographical area occupied by the species at the time it is listed, upon a determination by the Secretary that such areas are essential for the conservation of the species. Section 4(b)(2) of the Act states that the Secretary must make the designation on the basis of the best scientific data available and after taking into consideration the economic impact, the impact on national security, and any other relevant impacts of specifying any particular area as critical habitat.

Information Requested

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

(1) 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, alternative migratory pathways, and the locations of any additional populations of this species;

(d) Population dynamics and contributions from the nonmigratory populations, specifically resident monarchs in southern Florida, the Gulf Coast, the southern Atlantic Coast, and the southern Pacific Coast;

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

(f) 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;

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

(d) Other potential threats that were not identified as key threats to the 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 monarch butterfly. 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 modifications or additional exceptions from the prohibitions in the 4(d) rule;

(c) Whether the provisions related to the maintenance, enhancement, removal, or establishment of milkweed should be revised to include spatial or temporal restrictions or deferments;

(d) Whether we should include an exception for the use of pesticides and, if so, what measures are reasonable, feasible, and adequate to reduce or offset pesticide exposure to monarchs from agricultural and non-agricultural uses (*e.g.,* rangeland, rights-of-way, forestry, commercial areas, and mosquito control), including measures for specific classes of pesticides (*e.g.,* herbicides, insecticides), pesticide uses, and application methods;

(e) Whether we should include an exception for direct impacts from transportation and energy infrastructure, including mortality from collisions with wind turbines; and

(f) Whether we could improve or modify our approach to the 4(d) rule in any way to provide for greater public participation and understanding, or to better accommodate public concerns and comments.

(5) Specific information related to critical habitat, such as the following:

(a) The amount and distribution of monarch butterfly habitat;

(b) Any additional areas occurring within the range of the species in the United States, especially in breeding, migratory, or overwintering areas, that should be included in the critical habitat designation because they (i) are occupied at the time of listing and contain the physical or biological features that are essential to the conservation of the species and that may require special management considerations, or (ii) are unoccupied at the time of listing and are essential for the conservation of the species; and

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

(6) Land use designations and current or planned activities in the subject areas and their possible impacts on proposed critical habitat.

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

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

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

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

Please include sufficient information with your submission (such as scientific journal articles or other publications) to

allow us to verify any scientific or commercial information you include.

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

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

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

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

Our final determination may differ from this proposal because we will consider all comments we receive during the comment period as well as any information that may become available after this proposal. Based on the new information we receive (and, if relevant, any comments on that new information), we may conclude that 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. For critical habitat, our final designation may not include all areas proposed, may include some additional areas that meet the definition of critical habitat, or may exclude some areas if we find the benefits of exclusion outweigh the benefits of inclusion and exclusion will not result in the extinction of the species. In addition, we may change the parameters of the prohibitions or the exceptions to those prohibitions in the protective regulations issued or applied 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

We have scheduled two public informational meetings with public hearings on this proposed rule for the monarch butterfly. We will hold the public informational meetings and public hearings on the dates and times listed above under *Public informational meeting and public hearing* in **DATES**. We are holding the public informational meetings and public hearings via the Zoom online video platform and via teleconference so participants can attend remotely. For security purposes, registration is required. To listen and view a meeting and hearing via Zoom, listen to a meeting and hearing by telephone, or provide oral public comments at a public hearing by Zoom or telephone, you must register. For information on how to register, or if you encounter problems joining Zoom the day of the meeting, visit *https://www.fws.gov/species/monarch-danaus-plexippus.* Registrants will receive the Zoom link and the telephone number for the public informational meeting and public hearing for which they have registered. If applicable, interested members of the public not familiar with the Zoom platform should view the Zoom video tutorials (*https://support.zoom.us/hc/en-us/articles/206618765-Zoom-video-tutorials*) prior to the public informational meetings and public hearings.

The public hearings will provide interested parties an opportunity to present verbal testimony (formal, oral comments) regarding this proposed rule. While the public informational meetings will be opportunities for dialogue with the Service, the public hearings are not: They are forums for accepting formal verbal testimony. In the event there is a large attendance, the time allotted for oral statements may be limited. Therefore, anyone wishing to make an oral statement at a public hearing for the record is encouraged to provide a prepared written copy of their statement to us through the Federal eRulemaking Portal, or U.S. mail (see **ADDRESSES**, above). There are no limits on the length of written comments submitted to us. Anyone wishing to make an oral statement at a public hearing must register before the hearing *https://www.fws.gov/species/monarch-danaus-plexippus.* The use of a virtual public hearing is consistent with our regulations at 50 CFR 424.16(c)(3).

Previous Federal Actions

On August 26, 2014, we received a petition from the Center for Biological Diversity, Center for Food Safety, Xerces Society for Invertebrate Conservation, and Dr. Lincoln Brower, requesting that we list the monarch butterfly as a threatened species under the Act. On December 31, 2014, we published a 90-day finding that the petition presented substantial scientific or commercial information, indicating that listing the monarch butterfly may be warranted (79 FR 78775). On December 17, 2020, we published a 12-month finding that listing the species as an endangered or threatened species is warranted but precluded by higher priority actions (85 FR 81813). The species remained so designated in the annual candidate notices of review on May 3, 2022 (87 FR 26152), and June 27, 2023 (88 FR 41560).

Peer Review

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

In accordance with our joint policy on peer review published in the **Federal Register** on July 1, 1994 (59 FR 34270), and our August 22, 2016, memorandum updating and clarifying the role of peer review in listing actions under the Act (*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 monarch butterfly SSA report. In 2018, we sent the first version (1.0) of the SSA report to 6 independent peer reviewers and received 5 responses. In 2020, we sent the second version (2.0) of the SSA report to 3 peer reviewers and received 2 responses. In 2023, we sent the SSA

report version 2.2 to 13 peer reviewers and received 7 responses. No individual peer reviewed the SSA report more than once. Results of this structured peer review process can be found at *https://www.regulations.gov.* In preparing this proposed rule, we incorporated the results of these reviews, as appropriate, into the SSA report, which is the foundation for this proposed rule.

Summary of Peer Reviewer Comments

As discussed in Peer Review above, we received comments from 14 total 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 provided additional references, clarifications, and suggestions.

We updated the SSA report based on these peer reviewers' comments, including restructuring several sections within the report, revising our description of adaptive capacity, clarifying specific points and terminology where appropriate, and adding additional details and suggested references when needed. Additional peer reviewer comments are addressed in the following summary, as well as throughout the Summary of Biological Status and Threats, below, and were incorporated into the SSA report as appropriate (Service 2024a, entire).

Comment 1: Two reviewers asked us to elaborate on whether our assessment of resilience or the extinction threshold for western migratory monarchs should change based on a few years of numbers that have bounced back above 200,000 after the low of less than 2,000 individuals in the winter of 2019–2020.

Our response: It is plausible that migratory monarchs experienced good weather that resulted in abundant and well-timed milkweed and nectar resources across their breeding habitat in western North America in 2021, which provided for a significant increase in the overwintering count from below 2,000 individuals in 2019–2020. With only a few years of improved population numbers, we are currently unable to determine whether the western migratory population's status is improving or if these data support the continuation of its fluctuation and decline. While this does not change our current assessment of the population's resilience, we have added text clarifying this uncertainty to our SSA report to further address this comment.

We also revisited our extinction thresholds in western North America. In the model presented in our SSA, we use a range of extinction thresholds, which are informed by scientific literature (*i.e.,* Schultz et al. 2017, entire; Wells et al. 1990, p. 124). With the observed western population rebound, these estimates may be conservative. While the extinction thresholds we used are currently the best available, some uncertainty remains about the size of extinction thresholds and the time lag necessary to confirm assumptions about population stability or extinction trajectories. Therefore, we could be either overestimating or underestimating extinction risk depending on the accuracy of the thresholds.

Comment 2: One reviewer questioned our reliance on overwintering counts to inform our understanding of eastern North American monarch butterfly population trends, in contrast to using surveys at other locations and at other times during the year.

Our response: Monitoring at overwintering sites allows for the most practical and direct assessment of annual population levels, where the near-entirety of the migratory population can be evaluated consistently and comprehensively, reflecting the full range of threats and population dynamics encountered over the prior annual breeding and migration cycle. The question about the optimal approach for annual census of monarch butterfly populations (*e.g.,* overwintering data v. non-overwintering data) has been addressed in a more recent review of the methodology, which concluded that the overwintering area of the eastern North American population is an accurate representation of the size of the population (Pleasants et al. 2024, p. 62). Our analysis of this topic based on the preponderance of scientific evidence is incorporated into the most recent version of the SSA report (Service 2024a, pp. 70–76).

Comment 3: Two reviewers noted that the decline of the eastern North American monarchs may have slowed or stabilized for the past decade or more, potentially due to an associated slowing or plateau of habitat loss. With this potential slowing or stabilization, one of these reviewers asked if the extinction risk may have thus decreased. They also noted differences in population decline based on the modeling assumption of density-dependence or independence.

Our response: The estimates of population viability (and extinction risk) presented in the SSA report are based on the overall population trajectory (growth rate), along with the current population size and the fluctuations exhibited year-to-year. Growth rate and variability are derived using time series data, which may be influenced by the number of years being analyzed.

Different analyses have explored the possibility that past declines in milkweed, or habitat more generally, alongside the expansion of genetically modified crops and associated herbicides and pesticides, may have effectively plateaued in recent years. Some evidence has emerged of a change in trajectory for the eastern population since 2014, but as of 2020, statistical support for such a change was insufficient (Thogmartin et al. 2020, entire). More recently, an analysis of overwintering data for the eastern population estimated a median annual rate of growth of 0.93 (0.67–1.30, 95-percent confidence interval (CI)). These results indicate that the population is declining, even when assuming relatively stable land use and landcover change relative to the conditions that had driven steeper population declines in previous decades (Thogmartin 2024, entire).

Other published analyses estimate monarch population growth rates and persistence/extinction risks using alternative models and different data sets. These include non-overwintering population data, different time-series of annual population estimates, different modeling assumptions about density-dependence, and different relationships between population size and growth (*i.e.,* increased density of monarchs will result in decreased population growth and decreased density of monarchs will result in increased population growth). One recent analysis (Meehan and Crossley 2023, entire) used a variable change model to characterize the trend in eastern North American monarch abundance, suggesting that the monarch population has rebounded after a period of decline, thereby leading to a markedly lower risk of extinction relative to other assessments (*e.g.,* Semmens et al. 2016, entire; Schultz et al. 2017, entire; Thogmartin 2024, entire), including our SSA analyses. Meehan and Crossley (2023, entire) assume density dependence, which constrains the uncertainty associated with the predicted abundance estimates (small populations recover faster under density-dependent assumptions than density-independent assumptions). Though their density dependent model provides a good fit for the 10-year dataset they analyzed, the models cannot identify the mechanism behind the apparent decline in growth rate as populations increase. The assessment by Meehan and Crossley (2023, entire) did not incorporate the impacts of changing future conditions.

Another analysis that also did not incorporate the impacts of changing future conditions assumes the variability in the population numbers is now driven by environmental and demographic stochasticity (Thogmartin 2024, entire). This approach is more conservative because it results in increased variability at small populations sizes, as compared to the assumption of density dependence (which assumes increased per capita growth when populations are small). In this modeling approach, when population abundance has been reduced to a low level, demographic and environmental stochasticity alone (and not necessarily a declining trend) are now the driving factors, resulting in an increased risk of extinction. After careful examination, our estimates in the SSA for the annual rate of growth, population viability, and extinction risk continue to be in line with the best available information.

Comment 4: One reviewer of a later version of the SSA asked for additional clarification on why the model for monarch butterfly extinction was not re-run with updated data that had been collected since the first version of the SSA.

Our response: Based on our previous sensitivity testing of the model presented in the SSA, updated values would not significantly change the output and results, and thus would not change the outcomes in our report. Therefore, instead of rerunning the model, we instead prioritized evaluating new literature and information that might have changed the SSA analyses and conclusions. We provide further clarification and explanation in the updated SSA report (Service 2024a, p. 149).

Comment 5: One reviewer commented that nonmigratory monarch butterflies might persist, even if the migratory monarchs were to become extirpated. The reviewer also suggested that one potential reason for the declines in migratory individuals in the West could be due to a shift to more individuals existing in nonmigratory populations during winter.

Our response: According to recent research, the resident (nonmigratory) population in California is not sufficient to make up for the loss of the migratory population in western North America; there are still orders of magnitude fewer butterflies now than in the recent past (Crone and Schultz 2021, p. 1535). Also, the resident population probably lacks the demographic capacity to expand its range inland during summer months. Resident populations of monarch butterflies build up high levels of a protozoan parasite, *Ophryocystis elektroscirrha* (*OE*), at least in part due to the absence of migratory culling and migratory escape (Satterfield et al. 2015, pp. 4–5). In California, about 8 percent of migratory monarch butterflies are infected with *OE,* compared to about 75 percent of residents (Satterfield et al. 2016, p. 346). Similarly, for the eastern North American population, less than 10 percent of migratory monarch butterflies are infected with *OE,* compared to 75–100 percent of nonmigratory monarchs in Florida (Altizer and de Roode 2015, p. 91). *OE*-infected monarch butterflies experience lower survival, lower egg-laying rates, and produce about 0.8 adult daughters per female (Crone and Schultz 2021, Supplement S4). This rate of increase is enough for resident monarch butterfly populations to persist in urban areas, but it does not provide the ability to rapidly colonize the other Western States (Crone and Schultz 2021, p. 1536). We acknowledge alternative overwintering strategies, including nonmigratory monarchs, in the uncertainties section of the SSA report (Service 2024a, pp. 70–76).

I. Proposed Listing Determination

Background

A thorough review of the taxonomy, life history, and ecology of the monarch butterfly (*Danaus plexippus;* referred to as ''monarch'' or ''monarch butterfly'' herein) is presented in the SSA report version 2.3 (Service 2024a, entire).

The monarch is a brightly colored butterfly species, native to North America, with a range that has expanded west via human assistance to many islands in the Pacific Ocean and to the east to the Iberian Peninsula to now occupy 90 countries, islands, and island groups. Despite the expansion, over 90 percent of monarchs worldwide continue to live and migrate in their native range in North America. The species requires habitat with milkweed (genus *Asclepias* or closely related genera) as a larval host plant and floral nectar sources for adults. Migratory monarchs in North America also use overwintering habitat, where the adults cluster on trees.

Adult monarch butterflies are large and conspicuous, with bright-orange wings surrounded by a black border and covered with black veins. The black border has a double row of white spots, present on the upper side and lower side of forewings and hindwings (Bouseman and Sternburg 2001, p. 222). Adult monarchs are sexually dimorphic, with males having narrower wing venation and scent patches (Commission for Environmental Cooperation (CEC) 2008, p. 11). The monarch butterfly has bright and contrasting coloration, which serves as a warning to predators that eating them can be toxic.

The migratory North American populations are located east and west of the Rocky Mountains and overwinter primarily at sites with specific microhabitats in central Mexico and California, respectively. In central Mexico, the species primarily overwinters in mountainous regions where the monarchs form dense clusters mainly on oyamel fir trees (*Abies religiosa*). Western monarchs spend the fall and winter at tree groves along the California coast, northern Baja California, Mexico, and at a few inland sites in the Saline Valley of California. These groves are populated by a variety of tree species, including blue gum eucalyptus (*Eucalyptus globulus*), Monterey pine (*Pinus radiata*), Monterey cypress (*Cupressus macrocarpa*), and others. The overwintering sites for both the eastern and western North American migratory monarch populations provide protection from the elements and a microhabitat conducive for winter survival. In contrast, monarchs in habitats with suitable winter climates (*e.g.,* some areas in California and Florida) may breed year-round without migrating.

During the breeding season for monarchs, adults lay their eggs on milkweed, and larvae emerge after 2 to 5 days (Zalucki 1982, p. 242; CEC 2008, p. 12). Larvae develop through five larval instars (intervals between molts) over a period of 9 to 18 days, feeding on milkweed and sequestering toxic cardenolides as a defense against predators (Parsons 1965, p. 299). The larva then pupates into a chrysalis before eclosing 6 to 14 days later as an adult butterfly. Monarchs produce multiple generations during the breeding season, with most adult butterflies living approximately 2 to 5 weeks; however, migrating and overwintering adults enter into reproductive diapause (suspended reproduction) and live 6 to 9 months (Cockrell et al. 1993, pp. 245–246; Herman and Tatar 2001, p. 2509).

Regulatory and Analytical Framework

Regulatory Framework

Section 4 of the Act (16 U.S.C. 1533) and the implementing regulations in title 50 of the Code of Federal Regulations (CFR) 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 implementing regulations at 50 CFR 424.11(d) set forth a framework for evaluating the foreseeable future on a case-by-case basis, which is further described in the 2009 Memorandum Opinion on the foreseeable future from the Department of the Interior, Office of the Solicitor (M–37021, January 16, 2009; ''M-Opinion,'' available online at *https://www.doi.gov/sites/doi.opengov.ibmcloud.com/files/uploads/M-37021.pdf*). The foreseeable future extends as far into the future as the U.S. Fish and Wildlife Service and National Marine Fisheries Service (hereafter, the Services) can make reasonably reliable predictions about the threats to the species and the species' responses to those threats. We need not identify the foreseeable future in terms of a specific period of time. We will describe the foreseeable future on a case-by-case basis, using the best available data and taking into account considerations such as the species' life-history characteristics, threat projection timeframes, and environmental variability. In other words, the foreseeable future is the period of time over which we can make reasonably reliable predictions. ''Reliable'' does not mean ''certain''; it means sufficient to provide a reasonable degree of confidence in the prediction, in light of the conservation purposes of the Act.

Analytical Framework

The SSA report documents the results of our comprehensive biological review of the best scientific and commercial data regarding the status of the species, including an assessment of the potential threats to the species. The SSA report does not represent our decision on whether the species should be 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 its implementing regulations and policies.

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

The SSA process can be categorized into three sequential stages. During the first stage, we evaluated the individual species' life-history needs. The next stage involved an assessment of the historical and current condition of the species' demographics and habitat characteristics, including an explanation of how the species arrived at its current condition. The final stage of the SSA involved making predictions about the species' responses to positive and negative environmental and anthropogenic influences. Throughout all of these stages, we used the best available information to characterize viability as the ability of a species to sustain populations in the wild over time, 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 FWS–R3–ES–2024–0137 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.

Species Needs

Individual-Level Ecology

The monarch life cycle varies by geographic location. Migratory monarchs in North America are the

ancestral population for all other monarch populations (Pierce et al. 2014, p. 4; Zhan et al. 2014, p. 318; Hemstrom et al. 2022, pp. 4551–4552), which dispersed from North America via human assistance, potentially aided through wind dispersal events (Brower 1995, p. 354), and now occur in Central and South America; Australia; New Zealand; islands of the Pacific and Caribbean, and elsewhere (Malcolm and Zalucki 1993, pp. 3–5) where milkweed (their larval host plant) was already present or introduced. In a few parts of North America (such as parts of Florida, the Gulf Coast, and California) and in most areas outside North America, monarchs breed year-round, repeatedly following the above-referenced life cycle throughout the year. However, monarchs in temperate climates such as eastern and western North America undergo long-distance migration, where the migratory generation of adults is in reproductive diapause and lives for an extended period of time (Herman and Tatar 2001, p. 2509).

In the fall, in both eastern and western North America, monarchs begin migrating to their respective overwintering sites. This migration can take monarchs distances of over 2,000 miles (mi) (3,000 kilometers (km)) (Urquhart and Urquhart 1978, p. 1760) and last for over 2 months (Brower 1996, p. 93). The vast majority of migratory individuals in eastern North America fly south or southwest to mountainous overwintering grounds in central Mexico, although some minor alternative migratory routes have also been suggested (Dockx et al. 2023, p. 314). Migratory individuals in western North America generally fly shorter distances south and west to overwintering groves along the California coast into northern Baja California (Solensky 2004, p. 79). Data from monarchs tagged in the southwestern States in the fall suggest that those in Nevada migrate to California, those in New Mexico migrate to Mexico, and those in Arizona migrate to either Mexico or California (Southwest Monarch Study Inc. 2018, unpaginated). In early spring (February–March), surviving monarchs break diapause and mate at the overwintering sites before dispersing (Leong et al. 1995, p. 46; van Hook 1996, pp. 16–17). The same individuals that undertook the initial southward migration begin flying back through the breeding grounds, and their offspring start the cycle of generational migration over again (Malcolm et al. 1993, p. 262).

The spring monarch migrations in eastern and western North America represent massive annual range expansions. In eastern North America, monarchs travel north in the spring, from Mexico to Canada, over two to three successive generations, breeding along the way (Flockhart et al. 2013, pp. 4–5). Individual monarchs may disperse as far north as they can physiologically tolerate based on climatic conditions and available vegetation; the most specific predictors of the northern distribution of individual monarchs are monthly mean temperature and precipitation (Flockhart et al. 2013, p. 4; Flockhart et al. 2017, p. 2570). The number of generations of monarchs produced in a given year in a migratory population can vary between three and five and is dependent upon environmental conditions (Brower 1996, p. 100). While a majority of the eastern monarchs shift to the more northern reaches of their range, western monarchs continue to occupy and breed in warmer climates throughout the summer, while also expanding to include the farther reaches of their range. In the spring in western North America, monarchs migrate north and east over multiple generations from coastal California toward the Rockies and to the Pacific Northwest (Urquhart and Urquhart 1977, p. 1585; Nagano et al. 1993, entire). In the southwestern States, migrating monarchs tend to occur more frequently near water sources such as rivers, creeks, roadside ditches, and irrigated gardens (Morris et al. 2015, p. 100).

In addition to the monarchs that overwinter by clustering at known overwintering roost sites, some monarchs in North America also breed year-round or breed throughout the winter. These individuals require the breeding habitat and suitable climate (table 1) and are discussed further in Species-Level Ecology, below.

To facilitate the massive annual spring range expansion, adult monarch butterflies require a diversity of blooming nectar resources, which they feed on both throughout their migration routes and in their breeding grounds (spring through fall). Monarchs also need milkweed (for both oviposition and larval feeding) embedded within this diverse nectaring habitat. The correct phenology, or timing, of both monarchs and nectar plants and milkweed is important for monarch survival. The position of these resources on the landscape is important as well (see Population-Level Ecology, below). In western North America, nectar and milkweed resources are often associated with riparian corridors, and milkweed may function as the principal nectar source for monarchs in more arid regions (Dingle et al. 2005, p. 494; Pelton et al. 2018, p. 18; Waterbury and Potter 2018, p. 38; Dilts et al. 2018, p. 8). Individuals need nectar and milkweed resources year-round in nonmigratory populations. Additionally, many monarchs use a variety of roosting trees along the fall migration route (table 1).

Migratory individuals of eastern and western North America require a specific microclimate at overwintering sites. The eastern population of monarchs overwinter in Mexico, where this microclimate is provided by forests primarily composed of oyamel fir trees, on which the monarchs form dense clusters (Williams and Brower 2015, pp. 109–110). These cluster formations provide a buffer for individuals against freezing temperatures, lipid depletion, and desiccation (Brower et al. 2008, p. 186). The sites used for overwintering primarily occur in mountainous areas west of Mexico City located between elevations of 9,500 feet (ft) (2,900 meters (m)) and 10,800 ft (3,300 m) (Slayback and Brower 2007, p. 147). The temperature must remain cool enough to prevent excessive lipid depletion (Alonso-Mejía et al. 1997, p. 935), while at the same time staying warm enough to prevent freezing (Anderson and Brower 1996, pp. 111–113). Exposure to these cooler temperatures also helps orient the monarchs northward in the spring (Guerra and Reppert 2013, pp. 421–422). The oyamel fir forest provides essential protection from the elements, including rain, snow, wind, hail, and excessive solar radiation (Williams and Brower 2015, p. 109). Many sites also provide a source of hydration via nectar plants or a water source (Brower et al. 1977, pp. 237–238). Most of the observed overwintering sites are located within the Monarch Butterfly Biosphere Reserve, which covers more than 138,000 acres (ac) (56,000 hectares (ha)) (Vidal and Rendón-Salinas 2014, p. 169; Ramírez et al. 2015, p. 158).

Migratory monarchs in the western population primarily overwinter in groves along the coast of California and Baja California (Jepsen and Black 2015, p. 149). The location and structure of these sites provide the specific microclimate (although different from the Mexico overwintering microclimate) needed for survival in the western overwintering areas. Approximately 400 groves have been known to be occupied, but only a portion of these sites is occupied in any given year. These sites, typically close to the coast, span approximately 761 mi (1,225 km) of coastline (COSEWIC 2010, p. 10). These groves are populated by a variety of tree species, including blue gum eucalyptus, Monterey pine, and Monterey cypress

(Griffiths and Villablanca 2015, pp. 41, 46–47), all of which act as roost trees. These groves provide indirect sunlight for the overwintering monarchs, sources of moisture for hydration, defense against freezing temperatures, and protection against strong winds (Tuskes and Brower 1978, p. 149; Leong 1990, pp. 908–910, Leong 1999, p. 213). The close proximity to the coast (average distance of 1.47 mi (2.37 km)) also provides a mild winter climate (Leong et al. 2004, p. 180).

TABLE 1—INDIVIDUAL-LEVEL REQUISITES FOR MONARCH SURVIVAL AND REPRODUCTION

Life stage	Requirements	Description
Egg, larva, and adult—breeding.	Milkweed resources	Healthy and abundant milkweed is needed for oviposition and larval consumption.
Adult—breeding and migration.	Nectar resources	Sufficient quality and quantity of nectar from flowers is needed for adult feeding throughout the breeding and migration seasons.
Adult—overwintering	Suitable habitat for overwintering.	Habitat that provides a specific roosting microclimate for overwintering: protection from the elements (*e.g.,* rain, wind, hail, excessive radiation) and moderate temperatures that are warm enough to prevent freezing yet cool enough to prevent lipid depletion. Nectar and clean water sources located near roosting sites.
Adult—migration	Connectivity and phenology	Nectar and milkweed resources along the migration route when butterflies are present; the size and spatial arrangement of habitat patches are generally thought to be important aspects, but currently unknown. Roosting sites may also be important for monarchs along their fall migration route.

Population-Level Ecology

Monarchs, like many insects, are sensitive to environmental conditions (temperature and precipitation) and can experience large swings in population numbers from year to year in response to these conditions (Rendón-Salinas et al. 2015, p. 3; Schultz et al. 2017, pp. 345–346). During favorable conditions, monarch survival and reproductive rates are high and population numbers increase; conversely, when environmental conditions are unfavorable, survival and reproductive rates are low and population numbers can plummet. Thus, to successfully recruit over generations and years, they must be capable of withstanding large swings in population sizes (*N*). Specifically, they need a positive population growth rate (lambda, or λ) that is sufficient for the species to recover from annual stochasticity.

To support a strong growth rate, monarch populations require sufficiently large population sizes and an adequate quantity and quality of habitat to support these large population sizes. Large population sizes also help maintain genetic health and facilitate thermoregulation during the winter, which is important for good physical health. A sufficiently large population size may also be important for finding mates and repelling predators (Malcolm 2018, pers. comm.). Both migratory and breeding habitat need to be distributed throughout the landscape to ensure connectivity, allowing monarchs within a population to reach all portions of their range and to maximize lifetime fecundity (Zalucki and Lammers 2010, p. 84; Miller et al. 2012, p. 2).

Species-Level Ecology

The ecological requisites at the species level include having a sufficient number and distribution of healthy populations to ensure the species can withstand annual variation in its environment (resiliency), catastrophes (redundancy), and novel biological and physical changes in its environment (representation). We describe the monarch's requirements for resiliency, redundancy, and representation below.

Resiliency

Monarch populations with a robust growth rate, large effective population size, and suitable quality, quantity, and distribution of habitat conditions are better able to withstand and recover from environmental variability and stochastic perturbations (*e.g.,* storms, dry years) than those populations that are less demographically, genetically, or physically healthy. Given the monarch's sensitivity to environmental conditions, which can cause large swings in population numbers year-to-year (Rendón-Salinas et al. 2015, p. 3), monarchs occupying a diversity of environmental conditions and being widely distributed helps guard against populations being exposed to adverse conditions concurrently, and thus, fluctuating in synchrony. Asynchronous dynamics within and among populations minimizes the chances of concurrent losses, and thus, provides species resiliency.

Redundancy

Monarch redundancy is best achieved by having a broad geographic distribution of monarchs relative to the spatial occurrence of catastrophic events. For the eastern North American migratory population, potential catastrophic events include extreme storms when monarchs are densely congregated and widespread drought. For the western North American migratory population, potential catastrophic events include widespread drought and co-occurrence of poor environmental conditions and low population abundance. For dispersed non-migratory populations, potentially catastrophic events include sea level rise, which can inundate habitat, and lethal high temperatures.

Migratory North American monarchs are distributed across vast and diverse habitats across much of North America during their breeding and migratory seasons. However, while overwintering, most migratory monarchs are highly concentrated at sites in Mexico and California. Nonmigratory monarchs in North America are distributed in warmer, suitable areas throughout the year, including in parts of Florida, the Gulf Coast, and California. A very small proportion of the species is also distributed in nonnative or naturalized populations across diverse habitats throughout 90 countries, islands, and island groups.

Representation

The monarch's ability to withstand novel changes in its environment is influenced by its adaptive capacity, which is primarily a function of the species' breadth of variation in biological traits and genetic diversity. Without such variation, species are less responsive to change and more prone to extinction (Spielman et al. 2004, p. 15263). Additionally, as populations with higher genetic diversity can more quickly adapt to novel changes, species with genetically healthy populations are better able to adapt (Ofori et al. 2017, p.

2). Below we describe monarch adaptive capacity by using the best available data.

Migratory monarchs in North America are the ancestral population for all other monarch populations around the world (Pierce et al. 2014, p. 4; Zhan et al. 2014, p. 318; Hemstrom et al. 2022, pp. 4551–4552). Their unique genetics separate them from nonmigratory monarchs (Freedman et al. 2021, p. 7). Genetic sampling indicates that the monarchs from eastern and western North America have continued interchange between the two populations contributing to low genetic differentiation (Talla et al. 2020, p. 2573; Freedman et al. 2021, pp. 7–8). During the annual breeding season, the North American migratory populations use a vast and diverse array of habitats. Following a long-distance migration through more varied habitats and conditions, the North American migratory monarchs use sites with a diversity of physical structures and climatic conditions for overwintering. Having monarchs occupying areas of unique ecological diversity guards against losses of adaptive capacity due to stochastic or catastrophic events. Nonmigratory monarchs represent a life-history strategy that exposes them to selection pressures that differ from migratory monarchs.

Eastern North American monarchs undergo long-distance migration every fall, a behavior that differentiates this population from nonmigratory populations or from migratory populations that fly shorter distances and to different locations. The migratory phenotype of monarchs in the eastern migratory population is distinct from monarchs in other populations that may have latent migratory phenotypes (Tenger-Trolander et al. 2019, p. 14673). This migratory phenotype consists of both reproductive diapause and directional flight orientation to the south, and this migratory behavior of monarchs is remarkably sensitive to genetic and environmental change (Tenger-Trolander et al. 2019, p. 14673). Monarchs from the eastern North American migratory population tend to have larger bodies and larger elongated wings compared to monarchs from most nonmigratory populations (Altizer and Davis 2010, pp. 1023–1025). Eastern North American migratory monarchs inhabit 70 percent or more of the total area occupied by monarch butterflies in North America.

Western North American monarchs also migrate long distances, although their migration is shorter than monarchs in eastern North America. Whereas eastern monarchs may fly well over 2,000 mi (3,000 km) to reach the Mexican overwintering sites, western monarchs reach the California coast by flying approximately 300 mi to 1,000 mi (500 km to 1,600 km) (Yang et al. 2016, p. 1002; Edwards et al. 2023, p. 5). Western monarchs occupy warmer climates throughout the summer to include the farther reaches of their range while they continue to breed in the hotter regions (expand their range). Eastern monarchs, in contrast, follow more of a stepping-stone path into the northern States, vacating areas as they warm and recolonizing their range.

Western North American migratory monarchs occupy as much as 30 percent of the total area occupied by monarch butterflies in North America (Dilts et al. 2019, p. 11). Western monarchs use ecologically different breeding, migrating, and overwintering habitats (Brower et al. 1995, p. 542) compared to monarchs in eastern North America. Differences in breeding habitat include climate (Zalucki and Rochester 2004, pp. 220–221) and availability and abundance of native nectar and native milkweed plants (Borders and Lee-Mäder 2015, entire). The West is generally hotter and drier than the East, and the milkweed and nectar resources used by monarchs in the West and East differ (Dilts et al. 2019, entire). In the fall, western monarchs migrate from Canada and States west of the Rockies to overwintering groves located primarily along the California coast south into Baja California, Mexico (Jepsen and Black 2015, pp. 147–156). Roosting tree species used by western monarchs for overwintering are different than those used by the eastern population and include blue gum eucalyptus, Monterey pine, and Monterey cypress (Griffiths and Villablanca 2015, pp. 43–44). The western population has fewer monarchs, spread out among hundreds of overwintering sites compared to fewer than 20 sites in Mexico for the eastern population (Jepsen and Black 2015, pp. 147–156; Vidal and Rendón-Salinas 2014, entire).

Migratory monarchs in eastern and western North America may also contribute unique phenotypic variation in wing morphology/coloration, lipid reserves, and reproductive behavior (Talla et al. 2020, pp. 2572–2573; Freedman and Dingle 2018, p. 66; Davis 2009, p. 3; Brower et al. 1995, p. 542; Herman et al. 1989, pp. 52–54; 56–57). Compared to monarchs in western North America and to nonmigratory monarchs in southern Florida, eastern North American monarchs have lower rates of infection by the protozoan parasite *OE* (<10 percent; Altizer et al. 2000, p. 131), which may be due in part to their long-distance migration (Bartel et al. 2011, p. 348). Migratory monarchs in the West have *OE* infection rates (averaging 5–30 percent) that are lower than most nonmigratory populations but higher than the rates of infection in migratory monarchs in eastern North America (Altizer and de Roode 2015, p. 91).

Resident (nonmigratory) monarchs in North America now live in areas where milkweed availability and climate permit year-round breeding, and thus are able to reside continually without migrating. These nonmigratory monarchs in southern Florida are genetically distinct from the migratory North American monarchs, although the southern Florida population gets an annual influx of individuals from the eastern migratory monarch population (Knight and Brower 2009, p. 821; Zhan et al. 2014, p. 322). Also, some monarchs remain or become reproductively active and breed throughout the winter along the Gulf Coast, the southern Atlantic Coast, and the southern Pacific Coast (Howard et al. 2010, p. 3; Satterfield et al. 2016, p. 346). These monarchs are more likely to be infected with *OE* (Satterfield et al. 2016, p. 347; 2018, p. 1676), and there is some question of whether some of the offspring of these individuals might emerge in diapause and continue to Mexico or California overwintering sites later in the season (Batalden and Oberhauser 2015, p. 223). The best available information, including the quantity and quality of the habitat, indicates that the total number of resident monarchs appears to be quite small relative to the North American migratory populations that overwinter in Mexico and California. Some experts consider the resident monarch populations demographic sinks (see Crone and Schultz 2021, p. 1536), requiring continual influxes of monarchs from migratory populations to sustain them.

Nonmigratory Florida monarchs experience some of the highest recorded *OE* infection rates compared to other monarchs worldwide and particularly high rates compared to migratory eastern and western North America monarch infection rates (75–100 percent average infection rates in Florida vs. 5–30 percent infection rates in the western North American population and less than 10 percent infection rates in the eastern North American population; Altizer and de Roode 2015, p. 91). This may be due both to their inability to escape infected habitat, as well as the nonmigratory behavior not leading to any migratory culling (the removal of

less fit individuals from a population due to their inability to migrate) (Bartel et al. 2011, entire). While we assume most monarchs found in southern Florida are nonmigratory, it is possible that some are migratory (Dockx et al. 2023, pp. 314–317).

In the West, the population of migratory monarchs has declined from several million butterflies in the 1980s (Schultz et al. 2017, p. 345) to current levels (figure 1b). Concurrently in the West, a portion of nonmigratory monarch butterflies in urban gardens has been growing (Crone and Schultz 2021, entire). The increase in numbers of these nonmigratory monarchs do not seem to make up for the decline of the migratory population (Crone and Schultz 2021, entire). Additionally, the nonmigratory portion also probably lacks the demographic capacity to expand its range inland during summer months. Nonmigratory monarch butterflies build up high levels of *OE,* at least in part because of a lack of migratory culling and migratory escape (Satterfield et al. 2015, pp. 4–5). In California, about 8 percent of migratory monarch butterflies are infected with *OE,* compared to about 75 percent of nonmigratory individuals (Satterfield et al. 2016, p. 346). *OE*-infected monarch butterflies have both lower survival and lower egg-laying rates and produce only about 0.8 adult daughters per female on average (Crone and Schultz 2021, Supplement S4). While this rate of increase is enough for nonmigratory monarch butterflies to persist in urban areas, it does not allow them to expand to other western States (Crone and Schultz 2021, p. 1536). Additional information on the genetic structuring of monarchs outside of continental North America is available in the SSA report (Service 2024a, appendix 2).

In order to better understand the population dynamics and contributions from the nonmigratory populations, we are requesting additional information on resident monarchs in southern Florida, the Gulf Coast, the southern Atlantic Coast, and the southern Pacific Coast. To submit information, see the Information Requested section.

Threats

We have little to no information on positive or negative influences acting upon monarchs occurring outside of the eastern and western North American populations. There is limited information on predation, parasitism, and disease outside of eastern and western North American populations. Given this limited information, we were unable to ascertain to what extent predation, parasitism, and disease impact the monarch populations outside of the eastern and western North American populations. Similarly, while data suggest global use of insecticides is increasing, we are unable to estimate the degree of overlap with monarch populations and thus derive a credible projection of impact on the monarch populations outside of the eastern and western North American populations.

The primary drivers affecting the health of the two North American migratory populations are loss and degradation of breeding, migratory, and overwintering habitat (from past conversion of grasslands and shrublands to agriculture and widespread use of herbicides; logging/thinning at overwintering sites in Mexico; urban development, senescence, and incompatible management of overwintering sites in California; and drought); exposure to insecticides; and effects of climate change. Many other influences to monarchs were evaluated, including disease, parasitism, captive rearing, collection, impacts of tourism at overwintering sites, invasive swallow-wort plants, vehicle mortality, and natural catastrophes. However, these other potential influences were not determined to be key population drivers (Service 2024a, pp. 109–111).

Because the conversion of grasslands to agriculture was a key driver for past population declines, current and future activities that may remove milkweed and nectar resources within the breeding and migratory range, but that do not result in conversion of native or naturalized grassland, shrubland, or forested habitats and do not result in significant population-level mortality, are, therefore, not considered key population drivers. These include habitat restoration and management activities, livestock grazing and routine ranching activities, routine agricultural activities and conservation practices, fire management, silviculture and forest management, management of habitat on residential and other developed properties, and vegetation management activities when monarchs are not present. Given that so much milkweed has been lost historically and that monarchs are impacted by the ongoing effects of this past habitat loss and degradation, we need an approach that encourages landowners to add and maintain habitat in order to achieve a significant increase in the availability of milkweed and nectar resources. We expect localized removal of milkweed and nectar plants will be outweighed by an overall addition of these resources across the landscape, making broadscale public support for monarch conservation vitally important. For example, landscape-scale habitat restoration and management activities that provide for the habitat needs of monarch butterflies (*e.g.,* mowing, haying native rangeland, prescribed and cultural burning, and control of invasive plants or noxious weeds) may remove milkweed and could result in loss of monarchs in the short term but would also increase the overall quality and quantity of breeding habitat, which is likely to benefit monarch populations in the long term. We are requesting information on both our identified key threats as well as other potential threats to the species, such as collisions with wind turbines (see Information Requested). The key influences for monarch butterflies are discussed below.

Availability, Distribution, and Quality of Breeding Habitat and Migratory Habitat

The availability of milkweed is essential to monarch reproduction and survival. Reductions in milkweed are cited as a key driver in monarch declines (Brower et al. 2012, p. 97; Pleasants and Oberhauser 2013, p. 141; Inamine et al. 2016, p. 1081; Thogmartin et al. 2017a, p. 12; Waterbury and Potter 2018, pp. 42–44; Saunders et al. 2019, p. 8612).

A majority of the past milkweed loss has occurred in agricultural lands, where intensive herbicide usage for weed control has resulted in widespread milkweed eradication. More than 860 million milkweed stems were lost in the Midwest between 1999 and 2014, a decline of almost 40 percent (Pleasants 2017, p. 48). Approximately 89 and 94 percent of corn and soybean crop acreages, respectively, are planted as glyphosate (herbicide)-tolerant crops (USDA 2018, unpaginated). When glyphosate is sprayed in or near fields where crops are produced, it kills the milkweed without harming the glyphosate-tolerant crops. Glyphosate use in western agricultural lands has also increased dramatically since the 1990s, especially within the Central Valley of California, Snake River Plain of Idaho, and the Columbia River Basin, which spans the border between Washington and Oregon (USGS NAWQA 2017, unpaginated; Waterbury and Potter 2018, p. 42). As weed species develop increasing resistance to glyphosate, other herbicide (*e.g.,* dicamba)-tolerant crops are developed, which can lead to a corresponding increase in use of those herbicides. Accordingly, herbicide impacts to milkweed and nectar plants will continue to impact monarch resources in agricultural lands.

Milkweed has also been lost on the landscape through development and conversion of grasslands (Lark et al. 2015, pp. 3–4). Between 2008 and 2016, a total of 4.9 million acres of grassland were converted to new cropland, including up to 3 million acres of Conservation Reserve Program land (Lark et al. 2015, p. 5). Past loss of agricultural milkweeds in the Midwest has resulted in an estimated 81 percent decline in monarch production, in part because monarch egg densities were higher on milkweed in agricultural fields (3.89 times more eggs than on non-agricultural milkweed; Pleasants and Oberhauser 2013, pp. 139–140). This situation particularly impacts the eastern monarch population because more Mexico overwintering monarchs originate from the Midwest crop belt region than any other region (with estimates ranging from 38 percent to over 85 percent of all overwintering monarchs originating from the Midwest; Wassenaar and Hobson 1998, pp. 15438–15439; Flockhart et al. 2017, p. 2568). Development and conversion of grasslands will continue to impact monarch resources in agricultural lands.

Losses of nectar sources have also been implicated as a potential key driver in monarch declines (Inamine et al. 2016, p. 1081; Thogmartin et al. 2017a, p. 12; Saunders et al. 2019, p. 8612). Losses of nectar resources are due to the same stressors identified above for milkweed resources. Additionally, with a warming climate, drought impacts may affect the availability of nectar sources, especially in the western population and in the migratory bottleneck through Mexico and into Texas for the eastern population (see *Climate Change Effects,* below).

Our future analyses forecast a range of projections for future nectar and milkweed throughout the monarch butterfly's range. While these breeding and migratory habitat resources show signs of regional stabilization or increase, even the best case scenario increases are less than the amount of milkweed and nectar resources that have been lost. The reduced amount of breeding and migratory habitat continues to negatively impact the viability of the migratory North American monarchs. Monarch conservation needs an approach that encourages and incentivizes landowners to add milkweeds and nectar resources and implement actions to maintain this habitat. Unlike with some at-risk species, the monarch's general habitat usage and wide distribution allow a broad range of landowners to participate in actions to support the species. Conservation for the species can occur on land parcels ranging from quite small to very large, including gardens, parks, grasslands, agricultural areas, and more.

Availability, Distribution, and Quality of Overwintering Habitat

Both western and eastern monarchs rely on the microclimate provided by the trees at their overwintering sites (Leong et al. 2004, entire; Williams and Brower 2015, entire). Loss of trees occurs at overwintering sites in Mexico primarily through small- and large-scale logging, storms, and an increasingly unsuitable climate (see *Climate Change Effects* below). Most overwintering sites used by eastern monarchs occur within the Monarch Butterfly Biosphere Reserve (Reserve), a 139,019-ac (56,259-ha) protected area in Central Mexico. Within this area, logging is banned within the 33,485-ac (13,551-ha) core zone (Ramírez et al. 2015, p. 158). However, logging has continued to occur both legally (including salvage logging allowed after storms) and illegally at multiple colonies within the Reserve (Vidal et al. 2014, pp. 180–185; Brower et al. 2016, entire).

Logging was estimated in the core zone of the Reserve from 2002 through 2012 (Vidal et al. 2014, p. 180). Within this period, 5,384 acres (2,179 ha) of core zone were either deforested (less than 10 percent canopy cover remained; 3,099 ac (1,254 ha)) or degraded (a decrease in canopy cover; 2,286 ac (925 ha)). Most of these losses were attributed to illegal logging (5,083 ac (2,057 ha)), with the remaining 301 acres (122 ha) lost due to floods, drought, strong winds, and fire. Current estimates of forest loss throughout the Reserve vary from 0–2.4 percent per year (Ramírez et al. 2015, p. 163). While anti-logging and reforestation efforts are underway (López-García 2022, p. 245), logging is still ongoing within the Reserve (Brower et al. 2016, entire). Although clearcutting of forests destroys habitat directly, thinning of the forest also changes the microclimate needed by overwintering monarchs, making them more susceptible to winter mortality (Brower et al. 2011, p. 43).

Western monarch overwintering habitat along the Pacific Coast has been subject to loss through various forms of development, particularly urban development (Sakai and Calvert 1991, p. 149; Frey and Schaffner 2004, p. 172). Since the 1980s, development has caused the loss of at least 63 known California overwintering sites (Sakai and Calvert 1991, pp. 148–49, Meade 1999, p. 97–100, Xerces Society 2024a, unpaginated). Habitat alteration, such as through natural tree senescence and improper grove management, can also alter the microclimate of the western overwintering sites, leading to less suitable habitat conditions (Jepsen et al. 2015, p. 17). Many other stressors can work alone or in tandem on the western overwintering sites, including disease and pests that impact the trees used for overwintering. Fire is also a threat, both indirectly through habitat loss and directly to overwintering monarchs (Pelton et al. 2016, pp. 28, 32). Drought in the West can further exacerbate the stressors on the western overwintering sites (see *Climate Change Effects* below).

Insecticide Exposure

Insecticides are pesticides with chemical properties that are designed to kill insects and most are non-specific and broad-spectrum in nature. That is, insects exposed to these insecticides are susceptible to mortality or sublethal effects. Furthermore, the larvae of many lepidopterans (*i.e.,* insects in the order that includes butterflies and moths) are considered major pest species, and insecticides are tested specifically on this taxon to ensure that they will effectively kill individuals at application rates indicated on product labels. Even though monarchs are not the target species of these products, they may be exposed to insecticides where they are applied and in areas beyond the insecticide application sites due to drift (Olaya-Arenas and Kaplan 2019, p. 1; Halsch et al. 2020, p. 3).

Insecticide impacts to monarchs are primarily influenced by the extent to which monarchs are exposed to insecticides throughout their range. Although insecticide use is most often associated with agricultural production (*e.g.,* between 2005 and 2012, 60 percent of insecticides applied occurred on agricultural lands; EPA 2017, p. 11), any habitat where monarchs are found may be subject to insecticide use. Insecticides can be used for insect pest control anywhere there is a pest outbreak or for general pest prevention. Homeowners may treat yards and gardens to protect plants from pests or purchase plants from nurseries that sell plants pre-treated or grown from seeds treated with insecticides as ornamentals. Natural areas, such as forests and parks, may be treated to control for insects that defoliate, bore into wood, or otherwise damage trees. Outbreaks of pests, such as spongy moths, mosquitoes, Mormon crickets, or grasshoppers, may trigger insecticide treatments over large areas to control populations. Use of insecticides in vector control, especially pyrethroids and organophosphates, may be significant in areas of the country where mosquitoes pose a public health threat

or reach nuisance levels. The most widely used classes of insecticides include organophosphates, pyrethroids, and neonicotinoids. Studies looking specifically at dose-response of monarchs to neonicotinoids, organophosphates, and pyrethroids have demonstrated monarch toxicity at product label application rates and field concentration levels (*e.g.,* Krischik et al. 2015, entire; James 2019, entire; Krishnan et al. 2020, entire; Bargar et al. 2020, entire).

Insecticides are a threat to monarchs based on their mode of action to target insects and their potential exposure to monarchs. Monarchs can be exposed to liquid insecticides from direct spray at the time of application, contact with vegetation contaminated with an insecticide, or ingestion of leaves or nectar contaminated with insecticide following a spray. This exposure can occur on the site of application or in adjacent areas as a result of insecticide drift. Biopesticides, another type of insecticide, generally affect only the target pest and closely related organisms. These products contrast with broad-spectrum and conventional insecticides that target all insects. The primary identified biopesticide exposure threat to monarchs is limited to the liquid application of certain types of *Bacillus thuringiensis* (*Bt*) that are active against lepidopterans and often used to control caterpillar pests (such as spongy moth).

Monarchs may also be exposed to insecticides in forms other than liquids, such as those that have been systemically incorporated into plant tissues on which monarchs feed (*e.g.,* milkweed leaves, flowers, pollen, and nectar) or dust that has drifted off treated seeds at the time of planting. Numerous types of insecticides may be incorporated into plants systemically or used to treat seeds, including neonicotinoids. However, there are limited data to suggest that insecticides used in this manner achieve concentrations likely to result in negative effects to monarchs. Thus, while monarchs may be exposed to insecticide residues from these application methods, the available information indicates that negative effects from insecticide residues are likely minimal. For insecticides applied in solid forms such as granules, no exposure is expected to monarchs; thus, negative effects from application of pesticides in solid forms are unlikely.

Herbicides and fungicides are used within or near areas where monarchs may be present; however, only a subset of these have data showing direct negative effects to insects (*i.e.,* as opposed to insecticides, where all pesticides within this class will cause negative effects to insects). As such, the information indicates the negative effects to monarchs from exposure to herbicides and fungicides is likely minor compared to the direct effects of exposure to insecticides.

See Appendix 5—Supplementary Information About Pesticides in the monarch butterfly SSA report (Service 2024a, pp. 123–146) for further discussion of the risk of pesticides to the monarch, including data, references, and supporting information.

Climate Change Effects

Climate change can affect monarchs both directly and indirectly (Nail and Oberhauser 2015, entire) on overwintering, migratory, and breeding grounds. Increasing storm frequency in the Mexican overwintering colonies can lead to catastrophic (up to 80 percent) mortality through the freezing temperatures that accompany these storms (Anderson and Brower 1996, p. 112; Brower et al. 2004, entire). Precipitation is predicted to increase during the winter when monarchs are present in Mexico (Oberhauser and Peterson 2003, p. 14067). Severe drought can cause tree loss and degradation, decreasing the availability and quality of overwintering roosting habitat in California as well (Pelton et al. 2016, p. 29). Eucalyptus trees, the dominant tree species in many of the groves, are drought sensitive and become vulnerable to infestation by insect borers when they are stressed, which can exacerbate tree loss in these groves (Marcar et al. 1995, p. 46; Paine and Millar 2002, p. 148). Eucalyptus loss and degradation reduces availability of roosting habitat, lessens wind protection, and eliminates the primary overwintering source of nectar at many sites. Other dominant trees, such as Monterey pines and Monterey cypress, are more resistant to drought, but are the primary species in fewer than 25 percent of overwintering sites. Although overwintering grounds are widespread, drought could be equally as widespread, such that it could occur throughout many or most of the overwintering sites simultaneously. Given the above, extreme drought at overwintering sites poses a catastrophic risk for the western monarch population.

Monarchs need a very specific microclimate at their overwintering sites not just to avoid storm mortality, but also to avoid early fat depletion. Changing precipitation patterns and temperatures may influence the microclimate needed by overwintering monarchs (Williams and Brower 2015, p. 116). For example, current modeling of the monarch's fundamental niche predicts the loss of 38.6 to 69.8 percent of current suitable habitat within the Reserve due primarily to expected temperature changes (Zagorski 2016, p. 17). In western North America, climate change is predicted to cause a significant change in the distribution of overwintering monarchs in coastal California (Fisher et al. 2018, p. 10). While modeling projections suggest an inland and upslope displacement of suitable overwintering conditions by the year 2050, the best available evidence does not indicate that monarchs would move to or use these upslope areas (Fisher et al. 2018, pp. 10, 13–14).

In addition to the direct impact of climate change on overwintering monarchs, the Mexico overwintering sites are predicted to be less suitable for oyamel fir trees, the predominant monarch roosting tree. The overwintering sites are predicted to become increasingly warm throughout the year, potentially making 50 percent or more of the sites unsuitable for oyamel fir trees in 2030 (Sáenz-Romero et al. 2012, p. 102; Ramírez et al. 2015, p. 167). Widespread drought is similarly likely to negatively impact trees in the western overwintering areas both directly and indirectly due to increased susceptibility to pests (Paine and Millar 2002, p. 148).

Direct effects of climate change, particularly increasing temperatures, may impact monarch fecundity (reproductive rate) (Oberhauser 1997, pp. 168–169), mating success (Solensky and Oberhauser 2009, p. 333), and survival during migration and while overwintering (Masters et al. 1988, entire; Alonso-Mejía et al. 1997, entire). Laboratory studies indicate optimal temperatures for monarch range between 81–84 °F (27–29 °C) with sublethal effects beginning around 86–97 °F (30–36 °C) range and an upper lethal thermal limit of 108 °F (42 °C) (Zalucki 1982, p. 243; York and Oberhauser 2002, p. 294; Zalucki and Rochester 2004, p. 225; Nail et al. 2015, p. 101). Research also indicates that cooler nighttime temperatures provide respite from elevated daytime temperatures and are important in allowing monarchs to survive temperature stress (Nail et al. 2015, p. 104). Temperatures consistently above 91–95 °F (33–35 °C) are unsuitable for monarchs and may account for their general absence from the southern U.S. after spring (Malcolm et al. 1987, p. 78; Zalucki and Rochester 1999, pp. 155–157).

High temperatures and drought conditions may be particularly impactful during the crucial spring migration (Taylor 2020, pers. comm.). Spring temperatures and precipitation in the southern U.S. portion of the migratory range have been modeled to have a high relative importance affecting summer population size of eastern monarchs (a larger impact than compared to summer weather, summer herbicide use in cropland, and late-winter population size) (Zylstra et al. 2021, p. 1443). However, considerable uncertainty remains regarding the extent, intensity, and biological impacts of climate change during spring migration (Neupane et al. 2022, pp. 10–14). While increased temperatures may reduce monarch habitat in some areas, the climatically suitable niche for monarchs may increase northward, potentially increasing their summer breeding grounds if both monarchs and milkweed are able to adapt and track this niche northward (Lemoine 2015, pp. 10–17).

A warming climate may influence breeding habitat by altering suitable locations for both monarchs (Batalden et al. 2007, pp. 1369–1370) and their milkweed host plant (Lemoine 2015, entire). Nectar resources during migration may be reduced under climate conditions (decreased precipitation) projected for south-central Texas (Saunders et al. 2019, p. 8612). Drought may also influence the amount and availability of nectar needed for migrating butterflies (Brower et al. 2015, entire; Stevens and Frey 2010, p. 740; Espeset et al. 2016, p. 826). Widespread drought caused by climate change is expected to increase into the future (IPCC 2023, p. 69) negatively impacting monarchs and their habitat.

Sea level rise is increasing due to climate change. These rising sea levels are likely to impact monarch populations in coastal areas (*e.g.,* along the Gulf Coast) and low lying islands through loss of habitat (TBCSAP 2015, entire; IPCC 2023, p. 69).

Climate change may additionally impact monarchs in ways that are more difficult to measure. This may include phenological mismatch (*e.g.,* timing of milkweed and nectar sources not aligning with monarch migration; Thogmartin et al. 2017a, p. 13) or range mismatch with associated species. For example, a change in environmental suitability could cause a range shift for monarch predators and parasitoids, increasing or decreasing their overlap with the monarch's range (McCoshum et al. 2016, p. 229–233).

Conservation Efforts and Regulatory Mechanisms

While many factors have been implicated in the decline in monarch populations, the loss of milkweed and nectar resources (*i.e.,* breeding and migratory habitat) has been targeted as the threat that can be most easily addressed through conservation efforts. Because of the monarch butterfly's general habitat use and wide distribution, all sectors of society, including the general public, have an opportunity to participate in a broad range of conservation efforts throughout the species' range. Protection, restoration, enhancement, and creation of habitat is a central aspect of recent monarch conservation strategies, thus highlighting the importance of restoring and enhancing milkweed and nectar resources (Oberhauser et al. 2017, pp. 56–58; Pleasants 2017, p. 43; Thogmartin et al. 2017a, pp. 2–3; MAFWA 2018, p. 52; Pelton et al. 2019, pp. 4–5, WAFWA 2019, p. 41). Management at overwintering sites in California has also been targeted to improve the status of western North American monarch butterflies (Pelton et al. 2019, p. 4; WAFWA 2019, pp. 37–40). We are not aware of conservation actions for the populations outside of eastern and western North America, but conservation measures for the eastern and western North American populations are described below.

Major overarching landscape-level conservation plans and efforts include the Mid-America Monarch Conservation Strategy developed by the Midwest Association of Fish and Wildlife Agencies (MAFWA) and the Western Monarch Butterfly Conservation Plan developed by the Western Association of Fish and Wildlife Agencies (WAFWA). The Mid-America Monarch Conservation Strategy established a goal of adding 1.3 billion stems of milkweed on the landscape by 2038 (MAFWA 2018, p. 42). The 1.3-billion-stem goal is an estimated target for adding enough breeding and migratory habitat to support 14.8 ac (6 ha) of forest occupied by overwintering monarchs for the eastern North American population (Thogmartin et al. 2017b, pp. 2–3). Twenty-nine States—including Arkansas, Connecticut, Delaware, Illinois, Indiana, Iowa, Kansas, Kentucky, Maine, Maryland, Massachusetts, Michigan, Minnesota, Missouri, Nebraska, New Hampshire, New Jersey, New York, North Dakota, Ohio, Oklahoma, Pennsylvania, Rhode Island, South Dakota, Texas, Vermont, Virginia, West Virginia, and Wisconsin—have agreed to participate in the effort to reach the 1.3-billion-stem goal, which will also need contributions from multiple sectors of society, including private landowners, agricultural and nongovernmental organizations, rights-of-way organizations, and Federal, State, and local governments.

The Western Monarch Butterfly Conservation Plan currently encompasses the States of Arizona, California, Idaho, Nevada, Oregon, Utah, and Washington, which comprise the core of the western monarch range (WAFWA 2019, p. 3). The plan includes short-term goals of: (1) protecting and managing 50 percent of all currently known and active monarch overwintering sites, including 90 percent of the most important overwintering sites by 2029; and (2) providing a minimum of 50,000 additional acres of monarch-friendly habitat in California's Central Valley and adjacent foothills by 2029. It also includes overwintering and breeding habitat conservation strategies, education and outreach strategies, and research and monitoring needs. Many land managers who oversee overwintering sites in California have developed and implemented grove management strategies or have included monarch groves in their general management plans. Conservation efforts in California's Central Valley currently amount to nearly 9,000 ac (3,600 ha). As of September 2024, State agencies had implemented milkweed restoration efforts on over 8,780,404 ac (3,553,303 ha), adding more than an estimated 546 million milkweed stems to the landscape nationwide.

In early 2020, the Nationwide Candidate Conservation Agreement for Monarch Butterfly on Energy and Transportation Lands: An Integrated Candidate Conservation Agreement with Assurances (CCAA) and Candidate Conservation Agreement (CCA) was finalized and is contributing to MAFWA Strategy and WAFWA Plan goals. Under this agreement, energy and transportation entities are providing habitat for the species along energy and transportation rights-of-way corridors across the country. Participants carry out conservation measures to reduce or remove threats to the species and create and maintain habitat annually. In exchange for implementing voluntary conservation efforts and meeting specific requirements and criteria, those businesses and organizations enrolled in this CCAA/CCA receive assurance from the Service that they will not have to implement additional conservation measures should the species be listed. The goal of this CCAA/CCA is

enrollment of up to 26 million acres of land in the agreement, providing more than 300 million additional stems of milkweed (Rights-of-Way as Habitat Working Group 2020, p. 3). As of June 2024, this CCAA/CCA had 57 enrollees with over 981,812 ac (397,325 ha) of enrolled habitat.

Many conservation efforts implemented under Federal, Tribal, State, or other programs, such as the Farm Service Agency's Conservation Reserve Program; the Natural Resource Conservation Service's Environmental Quality Incentives Program, Agricultural Conservation Easement Program and Conservation Stewardship Program; and the Service's Partners for Fish and Wildlife Program, are expected to contribute to the overarching habitat and population goals of the MAFWA Strategy and WAFWA Plan. Smaller conservation efforts, such as pollinator gardens, implemented by local governments, nongovernmental organizations, private businesses, and interested individuals will also play an important role in reaching habitat and population goals established in the MAFWA Strategy and WAFWA Plan.

Many land managers who oversee overwintering sites in California have developed and implemented grove management strategies or have included monarch groves in their general management plans. Many others are in the process of developing grove management plans. As of January 2024, grove management plans are being implemented at no fewer than 24 overwintering sites and are currently being developed for at least a dozen more. Management and restoration of these sites may include activities such as replacing dead trees, modifying canopy structure, planting fall- and winter-blooming shrubs as nectar sources, and addressing monarch predation issues (Jepsen et al. 2017, entire).

The Service developed the Monarch Conservation Database (MCD) to capture information about monarch conservation plans and efforts to inform the listing decision. As of September 2024, the MCD had 145,455 complete monarch conservation effort records that have a status of completed, implemented, or planned since 2014 and 126 monarch conservation plans. These efforts constitute a total of 10,457,316 ac (4,231,926 ha) of land area in the United States (10,246,876 ac (4,146,764 ha) and 178,920 ac (72,406 ha) in the eastern and western populations, respectively) enhanced or created for monarchs, with the most common conservation effort being direct planting of milkweed and other nectar resources (note that these values include all completed, implemented, and not yet completed efforts; completed and implemented efforts to date total 7,415,731 ac (3,001,040 ha) nationally). These conservation efforts are increasing the amount of milkweed and nectar resources on the landscape. However, additional milkweed and nectar resources are required, as initial estimates of the amount of acreage needed to reach the 1.3-billion-stem goal within the MAFWA Strategy planning area were around 20 million acres.

In addition to conservation measures for monarch butterflies, there are also mechanisms that regulate direct and indirect threats to the species. One such mechanism is the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA), which provides for Federal regulation of pesticide distribution, sale, and use. The term pesticide includes insecticides, which can directly kill monarchs upon exposure, and herbicides that can indirectly affect monarchs by impacting their milkweed and nectar resources. All pesticides distributed or sold in the United States must be registered (licensed) by the U.S. Environmental Protection Agency (EPA). Before the EPA registers a pesticide under FIFRA, the applicant must show, among other things, that using the pesticide according to specifications ''will not generally cause unreasonable adverse effects on the environment.''

In 2021, the EPA began developing a comprehensive, long-term approach to meeting its section 7(a)(2) obligations for FIFRA actions (EPA 2022, unpaginated). As part of that work, the EPA in August 2024 finalized its first-ever strategy to identify which agricultural uses of conventional herbicides impact listed species and how to determine the amount and location of mitigation measures for those herbicides, hereon referred to as the Herbicide Strategy (EPA 2024a, entire). The strategy covers listed plants and listed animals whose survival depends on listed plants, including many insects that depend on plants for food. The EPA has begun applying the strategy to the registration of new pesticide registrations (EPA 2024d, unpaginated) and expects to apply the strategy when the agency reevaluates the registration of existing pesticides every 15 years.

Similarly, in July 2024 the EPA released its draft Insecticide Strategy, which proposes a framework to identify which agricultural uses of conventional insecticides impact listed species and how to determine the amount and location of mitigation measures for those insecticides (EPA 2024b, entire). The EPA has agreed to finalize the Insecticide Strategy by March 31, 2025, and then expects to apply it when the agency registers a new insecticide or reevaluates an existing one. The EPA is also pursuing other initiatives to minimize pesticide impacts on listed species, including through section 7(a)(2) consultations with FWS on individual pesticide active ingredients and through its Vulnerable Species Action Plan, which identifies mitigation measures for listed species particularly vulnerable to pesticides (EPA 2024c, entire).

Under the authority of the Plant Protection Act, the U.S. Department of Agriculture (USDA) regulates the importation and movement of plant pests, which covers plant-feeding insects such as the monarch butterfly. Under this regulation, a permit from USDA-Animal and Plant Health Inspection Service (APHIS) is required for the importation, interstate movement, and environmental release of butterflies, including monarchs. However, multiple States, including Alaska, Arizona, Connecticut, Hawaii, Montana, and Nevada, plus Puerto Rico, the Virgin Islands, and Guam, prohibit importation and/or interstate movement of monarchs for the purpose of environmental release. In addition, APHIS does not allow the movement of monarchs across the Continental Divide for environmental release.

Despite these conservation efforts and regulatory mechanisms, the continued threats facing the monarch butterfly have not been ameliorated.

Cumulative Effects

We note that, by using the SSA framework to guide our analysis of the scientific information documented in the SSA report, we have analyzed the cumulative effects of identified threats and conservation actions on the species. The best available scientific information indicates that there are synergistic and cumulative interactions among the factors influencing monarch butterfly viability. For example, climate change can impact the monarch directly through increased temperatures and can also impact other potential threats to the species, including habitat availability, disease, and predators. We incorporate the cumulative effects into our SSA analysis when we characterize the current and future condition of the species. To assess the current and future condition of the species, we evaluate the effects of all the relevant factors that may be influencing the species, including threats and conservation

efforts. Because the SSA framework considers not just the presence of the factors, but to what degree they collectively influence risk to the entire species, our assessment integrates the cumulative effects of the factors and replaces a standalone cumulative-effects analysis.

Current Condition

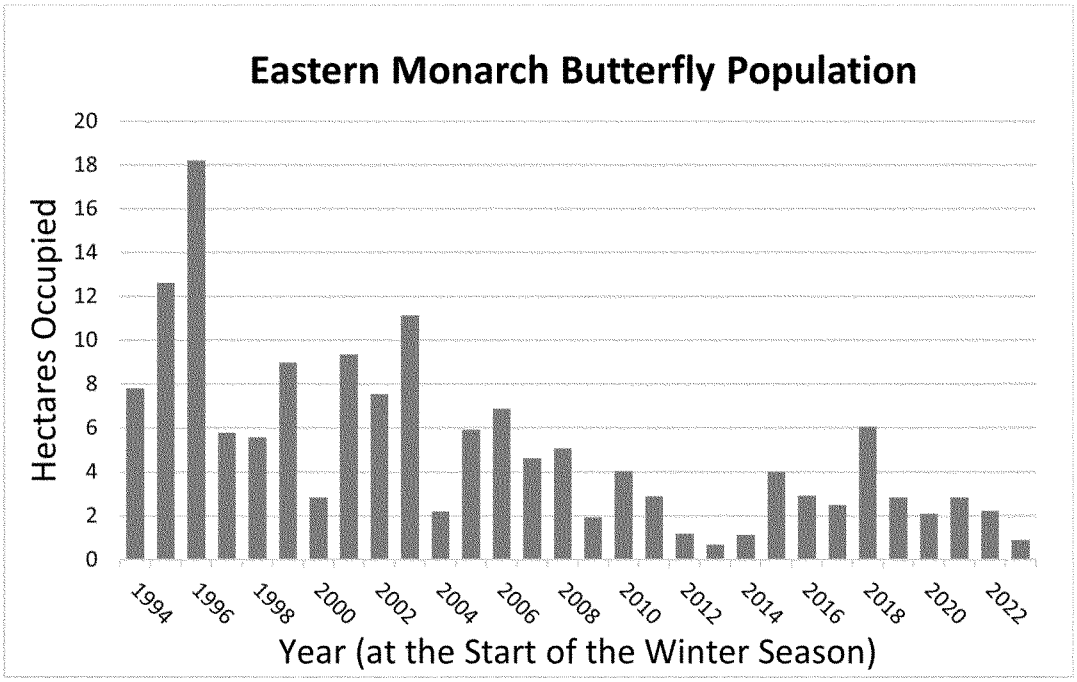
Eastern North American Population

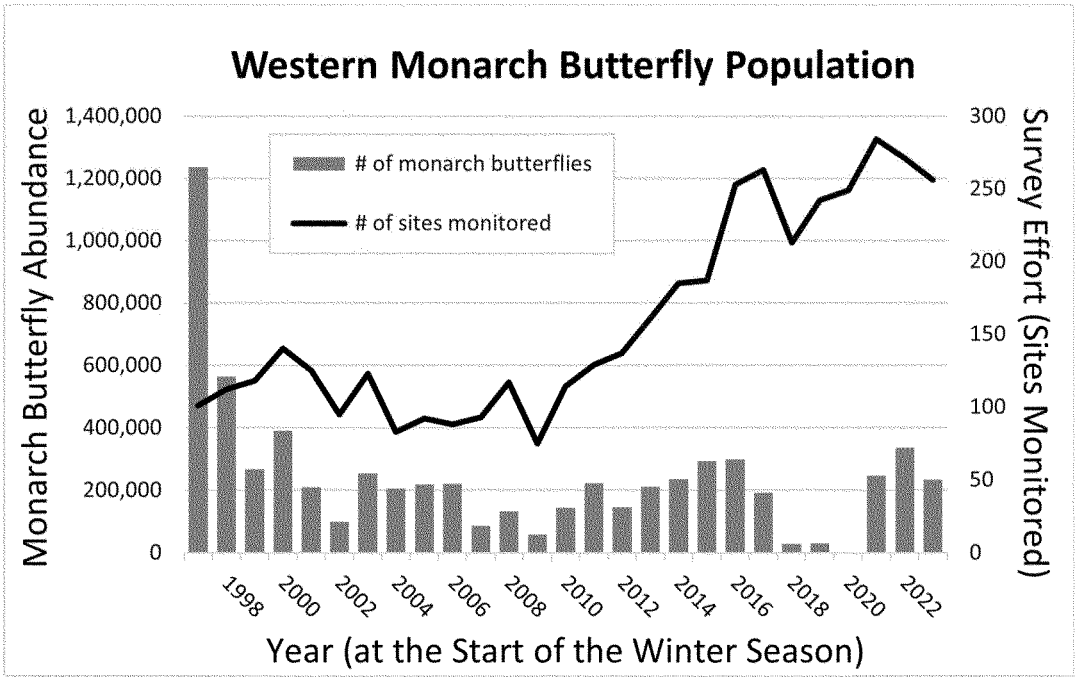
Based on the past annual censuses, the eastern North American population has been generally declining over the last 30 years (figure 1a). Because it is not possible to count individual monarchs at the overwintering sites in Mexico, the size of the eastern North American population is measured based on the area occupied by clustered monarchs. Although the numbers at the overwintering sites have declined, we did not find a corresponding change in the spatial extent of the population during the breeding season. We developed a population model that incorporated the current size, growth rate, and year-to-year variability of the eastern North American population. The results indicate that the probability of the population abundance reaching the point at which extinction is inevitable (''probability of extinction'') in is less than 10 percent within 10 years (Service 2024a, p. 29). The probability of extinction does not account for risks from catastrophic events (discussed below in Future Condition).

Western North American Population

Based on the past annual censuses, the western North American population has been generally declining over the last 27 years, despite an increasing number of sites being surveyed (figure 1b). We developed a similar model for the western North American population as we did for the eastern population. Under current conditions, the risk of extinction is predicted to increase sharply over time, between 60 to 68 percent within 10 years (Service 2024a, p. 30). The probability of extinction does not account for risks from catastrophic events (discussed below in Future Condition).

(a)





(b)

Figure 1—(a.) Area occupied (in hectares) by eastern North American monarch butterflies at overwintering sites in Mexico. Year displayed is the beginning year for the winter (*e.g.,* 2017 represents the number for the winter of 2017–2018). (Data from Rendón-Salinas et al. 2024 (p. 3).)

(b.) Survey counts showing the number of western North American monarch butterflies observed at overwintering sites (bars). The black line shows the number of sites monitored (survey effort) for a given year. (Data from the Xerces Society for Invertebrate Conservation (2024a, entire).)

Dispersed Nonmigratory Populations

Limited information is available on the status and health of monarchs outside of the North American migratory populations or regarding the positive or negative influences acting upon these populations. Based on observations of the species throughout its range, 69 of the 90 countries, islands, and island groups are currently extant. Monarch presence within the remaining 21 countries, islands, and island groups has not been confirmed since 2000, but with no evidence of extirpation, they are all presumed extant. Furthermore, we grouped occurrences into 31 populations. Of the 29 populations outside of North America, 25 are confirmed extant and the remaining 4 are presumed extant (Service 2024a, pp. 40–42). We were not able to further assess the level of resiliency of these populations.

Current Resiliency, Redundancy, and Representation

The species' redundancy is evident through its confirmed or presumed presence in all 90 of the countries, islands, and island groups where it occurred historically or to where it has dispersed. The species' adaptive capacity (representation) is evident through its presence over a large geographical range made up of 31 known populations (2 North American migratory populations and 29 nonmigratory or dispersed populations) where the climatic conditions and habitat vary widely. The species' resiliency varies between populations, with the estimated probability of extinction for the eastern migratory North American population at less than 10 percent in 10 years and 60 to 68 percent for the western migratory North American population in 10 years. For monarchs outside of the North American migratory populations, 69 of the 90 countries, islands, and island groups are considered currently extant, although we were not able to further assess the level of resiliency of these populations.

Future Condition

Future Scenarios and Catastrophic Events

North American Migratory Populations

To assess the future condition of monarch populations, we organized the key factors driving monarch population dynamics into six categories: (1) milkweed availability, (2) breeding nectar availability, (3) migration nectar availability, (4) overwintering habitat availability, (5) climate change effects, and (6) insecticide exposure. We then forecasted plausible increases and/or decreases, as appropriate, for each of these influences, using the best available information, including scientific literature and expert input. We also included conservation efforts outlined in large-scale monarch conservation plans, such as the MAFWA Strategy and WAFWA Plan. We did not evaluate these plans under the Policy for Evaluating Conservation Efforts (68 FR 15100; March 28, 2003) because these formalized conservation efforts have been implemented. Next, we combined the upper plausible limit and the lower plausible limit for each influence (changes in milkweed, nectar, and overwintering habitat; climate change; and insecticides) to form composite plausible best case and plausible worst case scenarios, respectively. Lastly, we incorporated these scenarios into the population models described in the *Current Condition* section, and forecasted population numbers to 60 years to determine the probability of extinction for both the eastern and western migratory North American populations to 2080 (Service 2024a, tables 6.1 and 6.2, pp. 45–47).

We also evaluated several potential events to determine if they were of sufficient magnitude and severity to cause a population collapse (*i.e.,* a catastrophic event). We determined that extreme storm events and widespread

drought have sufficient potential to pose a catastrophic risk to the eastern population, and widespread drought and co-occurrence of poor environmental conditions and low population abundance have sufficient potential to pose a catastrophic risk to the western population.

Dispersed Nonmigratory Populations

Due to a lack of information on current influences, we were unable to forecast future scenarios for the populations outside of eastern and western North America. However, we identified two potential catastrophic events, both of which are effects of climate change: sea level rise and lethal high temperatures.

Future Conditions

Eastern North American Population

Under both best and worst case scenarios described above, the population continues to decline ($\lambda < 1$). The greatest impact on the population occurs during the first 20 years for both scenarios; we had a slight increase in the growth rate from the current value under the best case scenario and a decrease of 4.5 percent under the worst case scenario. As expected under a declining growth rate, the probability of extinction increases over time (Service 2024a, p. 64). In 30 years, probability of extinction ranges from 24 to 46 percent. In 60 years, the probability of extinction for the eastern North American population ranges from 56 to 74 percent.

We were unable to incorporate direct effects from increasing temperatures and catastrophic risks into the population models, so we qualitatively discuss the implications of these factors on the future condition of the population. We evaluated the changes in the spatial extent and number of days with projected temperatures above lethal and sublethal thermal thresholds during critical time periods in monarch migration (Service 2024a, pp. 120–122). We assessed these changes under two future scenarios, using Representative Concentration Pathways (RCPs). RCPs reflect different levels of greenhouse gas emissions and the resulting climate change scenarios (IPCC 2014, p. 57). We used RCP4.5 and RCP8.5 scenarios projected to 2069 (Service 2024a, p. 122). Under the RCP4.5 scenario, both the spatial extent and the average number of days above 38 °C (100 °F) (the threshold for sublethal effects and moderate reductions in survival) are projected to markedly increase throughout much of the range, including the southern and northeastern portions of the eastern North American monarch breeding range. Although in the northcentral area of the breeding range, there is a projected decrease in spatial extent and the average number of days above 38 °C (100 °F). Under the RCP8.5 scenario, both the spatial extent and the average number of days above 38 °C (100 °F) have large increases throughout the entirety of the breeding range. The spatial extent and average number of days above 42 °C (107.6 °F) (the lethal threshold) are projected to increase dramatically in the southern U.S. during the same period under both scenarios. Given these results, monarch reproductive success and survival rates of the first generation of monarchs coming from the wintering grounds are likely to decline, although the extent to which these rates will decline is unknown.

Similarly, given the projected population decline described above, the eastern population will be increasingly vulnerable to catastrophic losses due to extreme storm events at the overwintering grounds and widespread droughts during the breeding season and along the migratory route. Although we cannot quantify this increased risk, the longer the eastern population remains at low population abundance, the more likely it is that catastrophic losses will occur and the greater the extinction risk for the eastern population.

Western North American Population

Under both scenarios, the population continues to decline ($\lambda < 1$). Under the best case scenario, monarchs have a slight increase in the growth rate from the current value; however, even with an increase, this was still a declining growth rate. Under the worst case scenario, the growth rate decreased to a lower rate than the current rate. As would be expected with a declining growth rate, the probability of extinction increases over time (Service 2024a, p. 66). In 30 years, probability of extinction ranges from 92 percent to 95 percent. By year 60, the probability of extinction reaches 99 percent for the western North American population.

Under the RCP4.5 scenario, increases are projected for the average numbers of days above 38 °C (100.4 °F) (38 percent) and above 42 °C (107.6 °F) (11 percent). Given this, monarch reproductive success and survival rates are likely to decline, although the extent to which these rates will decline is unknown.

Similarly, given the projections of monarch health described above, the western population is vulnerable to catastrophic losses due to both widespread drought events and the co-occurrence of poor environmental conditions and low population abundance. The risk of extinction due to these events increases the longer the population remains at the current low abundances.

Dispersed Nonmigratory Populations

We qualitatively assessed the impact due to predicted climate change effects. Fifteen of the 29 populations are classified as being ''at risk'' due to threats associated with climate change (6 due to sea level rise and 9 due to unsuitably high temperatures). The populations susceptible to sea level rise (Johnston Atoll, Kiribati, Marshall Islands, Nauru, Tokelau, and Tuvalu) are at risk of losing at least some of their monarch habitat; thus, redundancy could decrease with the loss of those areas. However, the best available information does not indicate if populations at risk to high temperatures will lose all or just a portion of their monarch habitat; thus, they may continue to contribute to redundancy. Each of the populations at risk due to sea level rise contains a single country, island, or island group. Therefore, in the dispersed nonmigratory populations the species will continue to have redundancy through continued presence in an estimated 84 of the 90 countries, islands, and island groups where it occurred historically or to where it has dispersed. We anticipate the species will continue to have adaptive capacity (representation) through its presence over a large geographical range where the climatic conditions and habitat vary widely.

Future Resiliency, Redundancy, and Representation

Both the eastern and western migratory North American populations become more vulnerable to catastrophic events (*e.g.,* extreme storms at the overwintering habitat) into the future resulting in lower redundancy for the species. Under plausible climate change scenarios, monarch butterflies will be exposed to unsuitably high temperatures for more days each year and over larger areas of their range in North America. Outside of the two North American migratory populations, 15 of the 29 nonmigratory or dispersed populations are at risk in the future due to threats associated with climate change (6 due to sea level rise and 9 due to unsuitably high temperatures). The populations susceptible to sea level rise are at risk of losing at least some of their monarch habitat; thus, redundancy could decrease with the loss of those areas. Rangewide, the species is likely to maintain considerable redundancy and adaptive capacity (representation)

through continued presence in an estimated 84 of the 90 countries, islands, and island groups where it occurred historically or to where it has dispersed. Despite uncertainties about resiliency at the nonmigratory and dispersed populations, the widespread distribution of monarch populations indicates that the species has low risk of becoming extirpated from multiple locations should a large-scale catastrophic event occur; thus, it is unlikely that a single catastrophic event would affect the entire species across its large range.

In the future, the resiliency of the eastern and western North American migratory populations will continue to decline. The estimated probability of extinction for the eastern migratory North American population is 56–74 percent in 60 years and greater than 99 percent for the western migratory North American population in 60 years.

Determination of Monarch Butterfly Status

Section 4 of the Act (16 U.S.C. 1533) and its implementing regulations (50 CFR part 424) set forth the procedures for determining whether a species meets the definition of an endangered species or a threatened species. The Act defines an ''endangered species'' as a species in danger of extinction throughout all or a significant portion of its range, and a ''threatened species'' as a species likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range. The Act requires that we determine whether a species meets the definition of 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

After evaluating threats to the species and assessing the cumulative effect of the threats under the Act's section 4(a)(1) factors, we determined that the primary threats affecting the monarch and its habitat are the ongoing impacts from loss and degradation of breeding, migratory, and overwintering habitat (from past conversion of grasslands and shrublands to agriculture and widespread use of herbicides; logging/thinning at overwintering sites in Mexico; urban development, senescence, and incompatible management of overwintering sites in California; and drought) (Factor A); exposure to insecticides (Factor E); and effects of climate change (Factor E).

While the monarch butterfly is historically native to North America with migratory and nonmigratory populations, monarchs have dispersed via human assistance from North America in the past two centuries and their range now includes populations throughout 90 countries, islands, and island groups where milkweed was already present or introduced. Populations exist in Central and South America, Australia, New Zealand, islands of the Pacific and Caribbean, and elsewhere (see Service 2024a, pp. 41–42). The primary threats have been affecting the resiliency of the eastern and western North American migratory populations over the last 20 years, and both populations now have lower abundances and declining population growth rates. However, in its current condition, the probability of extinction of the eastern migratory population is less than 10 percent over the next 10 years. The probability of extinction of the western migratory population over that same time period is higher (60–68 percent).

For monarchs outside of the two North American migratory populations, 69 of the 90 countries, islands, and island groups are considered currently extant. Monarch presence within the remaining 21 countries, islands, and island groups has not been confirmed since 2000, but the best available information does not indicate they are extirpated, and thus they are all presumed extant. Of the 29 populations outside of North America, 25 are confirmed extant, and the remaining 4 are presumed extant (see Service 2024a, pp. 40–42). Although we were not able to further assess the level of resiliency of these 29 nonmigratory or dispersed populations, the species' redundancy is evident through its confirmed or presumed presence in all 90 of the countries, islands, and island groups where it occurred historically or to where it has dispersed. The species' adaptive capacity is evident through its presence over a large geographical range made up of 31 known populations (2 North American migratory populations and 29 nonmigratory or dispersed populations) where the climatic conditions and habitat vary widely. Despite uncertainties about resiliency at some of the locations (*i.e.,* the 29 nonmigratory and dispersed populations), the number and distribution of populations at multiple locations makes it unlikely that a single catastrophic event would affect the entire species across its large range. Based on the best scientific and commercial data available, we conclude that the monarch butterfly is not currently in danger of extinction throughout all of its range.

While the monarch butterfly is not currently in danger of extinction, under the Act we must determine whether the species is likely to become in danger of extinction within the foreseeable future throughout all of its range (*i.e.,* whether the species warrants listing as threatened). In the foreseeable future, we anticipate the status of the eastern and western North American migratory populations will continue to decline due to the primary threats listed above. The probability of extinction of the eastern migratory population in the foreseeable future, which is 60 years, is estimated to be 56–74 percent, and the probability of extinction for the western migratory population is estimated to be 99 percent. Outside of the two North American migratory populations, we found that 15 of the 29 nonmigratory or dispersed populations are at risk in the future due to threats associated with climate change (6 due to sea level rise and 9 due to unsuitably high temperatures). The populations susceptible to sea level rise are at risk of losing at least some of their monarch habitat; thus, redundancy could decrease with the loss of those areas. However, the best scientific and commercial data available do not indicate if populations susceptible to high temperatures are at risk of losing all or just a portion of their monarch habitat; thus, they may continue to contribute to redundancy. Therefore, rangewide, we conclude that the species is likely to maintain considerable redundancy through continued presence in an estimated 84 of the 90 countries, islands, and island groups where it occurred historically or to where it has dispersed.

We find that the species will continue to have adaptive capacity (representation) through its presence over a large geographical range where the climatic conditions and habitat vary widely. Despite uncertainties about resiliency at the nonmigratory and dispersed populations, the widespread distribution of monarch populations indicates that the species has low risk of becoming extirpated from multiple locations should a large-scale catastrophic event occur; thus, it is unlikely that a single catastrophic event would affect the entire species across its large range. Thus, after assessing the best available information, we conclude that the monarch butterfly is not likely

to become in danger of extinction within the foreseeable future throughout all of its range.

Status Throughout a Significant Portion of Its Range

Under the Act and our implementing regulations, a species may warrant listing if it is in danger of extinction or likely to become so within the foreseeable future throughout all or a significant portion of its range. The court in *Center for Biological Diversity* v. *Everson,* 435 F. Supp. 3d 69 (D.D.C. 2020) (*Everson*), vacated the provision of the Final Policy on Interpretation of the Phrase ''Significant Portion of Its Range'' in the Endangered Species Act's Definitions of ''Endangered Species'' and ''Threatened Species'' (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 in a significant portion of its range—that is, whether there is any portion of the species' range for which both (1) the portion is significant; and (2) the species is in danger of extinction in that portion. Depending on the case, it might be more efficient for us to address the ''significance'' question or the ''status'' question first. We can choose to address either question first. Regardless of which question we address first, if we reach a negative answer with respect to the first question that we address, we do not need to evaluate the other question for that portion of the species' range.

Following the court's holding in *Everson,* we now consider whether there are any significant portions of the species' range where the species is in danger of extinction now (*i.e.,* endangered). In undertaking this analysis for the monarch butterfly, we choose to address the significance question first. We assessed whether any portions of the species' range are biologically significant by considering them in terms of each portion's contribution to resiliency, redundancy, or representation of the species as a whole.

The monarch butterfly is historically native to North America, and, as discussed above, it now occurs in nonnative or naturalized populations throughout 90 countries, islands, and island groups, including parts of Central and South America, Australia, New Zealand, islands of the Pacific and Caribbean, and elsewhere (see Service 2024a, pp. 41–42). To identify portions for evaluation, we considered these geographic areas independently and in various combinations to identify those which are biologically meaningful to the species.

We found that monarch habitat in North America represents a significant portion of the range. This geographical portion is significant because it is physically large, representing a large proportion of the species' range, and has unique habitat features that support monarch migration. The monarch's North American portion of the range covers approximately 2.8 billion ac (1.1 billion ha), encompasses an estimated 62 percent of the species' geographic range, and represents a vast majority of monarch butterflies worldwide. The portion is the ancestral source for migratory monarchs in North America and includes nonmigratory monarchs that have descended from migratory monarchs. The best available information indicates that the total number of nonmigratory monarchs in North America appears to be quite small relative to the North American migratory populations that overwinter in Mexico and California. The portion contains the entirety of breeding, migratory, and overwintering habitats used by monarchs in the eastern and western migratory populations. The monarchs within eastern and western North America have continued interchange between the two populations contributing to low genetic differentiation and forming an admixed population (Lyons et al. 2012, p. 3441; Talla et al. 2020, p. 2573; Freedman et al. 2021, pp. 7–8). These habitats in North America are unique because they facilitate massive annual range expansions during the breeding season. Temporary, seasonal resources allow monarchs to escape habitats as they become more heavily infected with diseases like *OE* (Bartel et al. 2011, entire). This seasonal movement also facilitates migratory culling where smaller and unhealthy individuals are removed from the breeding population because they are unable to survive long-distance migration (Bartel et al. 2011, entire; Majewska et al. 2021, p. 788). Years with favorable conditions across the broad and spatially diffuse breeding habitat in this portion have the potential to support rapid migratory monarch population increases (Yang et al. 2022, p. 20), which is important for population resiliency.

We also considered eastern and western North America as individual portions. The portion of North America used by the eastern migratory population is the largest area used by a single population in terms of geographic size. It represents roughly 43 percent of the species' global range. The portion of North America used by the western migratory population encompasses roughly 18 percent of the species' global range. Individually, neither portion makes up a large enough geographic area relative to the remainder of the range. Both migratory populations require sufficient quality and quantity of milkweed and nectar resources, suitable habitat for overwintering, and adequate connectivity and aligned phenology. Both of these portions provide the resources and space needed to facilitate the massive annual migration and range expansions necessary to maintain the viability of the migratory populations, as described above. However, because these portions individually constitute smaller areas, they were not determined to be significant individually when compared to the portion encompassing both North American migratory populations.

Having determined that North America is significant for the purposes of evaluating a significant portion of the monarch's range, we then proceeded to address the status question by examining the threats in that portion to determine if the species is endangered or threatened in that portion. The statutory difference between an endangered species and a threatened species is the timeframe in which the species becomes in danger of extinction; an endangered species is in danger of extinction while a threatened species is likely to become so (*i.e.,* endangered) within the foreseeable future. As discussed under *Status Throughout All of Its Range,* above, the primary current threats to the monarch butterfly are the ongoing impacts from loss and degradation of breeding, migratory, and overwintering habitat (from past conversion of grasslands to agriculture; widespread use of herbicides; logging/thinning at overwintering sites in Mexico; urban development, senescence, and incompatible management of overwintering sites in California; and drought), exposure to insecticides, and effects of climate change. We examined those threats along with the effects from disease and cumulative effects, and we considered whether conservation efforts and regulatory mechanisms ameliorated any of the effects.

Many of these factors and threats influence the monarch butterfly rangewide; however, because we identified the North America portion as being significant, we considered whether the threats are causing monarchs in the portion to have a different status than the remainder of

the range. As discussed above, this portion contains the eastern and western North American migratory populations. For the two migratory populations, we estimated the probability of the population abundance reaching the point at which extinction is inevitable for each population. In its current condition, the eastern migratory population has a probability of extinction of less than 10 percent over the next 10 years. The western migratory population has a higher risk of extinction due to current threats, with a probability of extinction of 60–68 percent over the next 10 years. The probability of extinction estimates do not account for risks from catastrophic events; however, we do not anticipate these effects to significantly increase extinction risk of North American migratory monarchs in the near term. Based on the eastern migratory population's level of resiliency in the near term and because monarchs are distributed across a broad geographic area contributing to the redundancy and representation of the species in the portion, we concluded that the monarch butterfly in North America is not in danger of extinction within this significant portion of its range and does not meet the definition of an endangered species.

We next considered whether the monarch butterfly is likely to become an endangered species within the foreseeable future in the North America portion (*i.e.,* if it meets the Act's definition of a threatened species). Looking across the range of future conditions for which we can make reasonably reliable predictions, the probability of extinction for the eastern migratory population is estimated to be 24–46 percent in 30 years and 56–74 percent in 60 years. The probability of extinction for the western migratory population is estimated to be 92–95 percent in 30 years and reaches 99 percent in 60 years. These probability of extinction estimates incorporate the primary factors that influence the populations' resiliency, including the ongoing impacts of availability of milkweed and nectar resources (losses as well as gains from conservation efforts), loss and degradation of overwintering habitat, insecticides, and effects of climate change. In addition to being affected by these factors, both the eastern and western migratory populations become more vulnerable to catastrophic events (*e.g.,* extreme storms at the overwintering habitat) into the future. Under plausible climate change scenarios, monarch butterflies will be exposed to unsuitably high temperatures for more days each year and over larger areas of their range in North America.

The best available scientific and commercial information indicates nonmigratory monarch populations in North America are very small compared to the size of the two migratory populations. In our assessment of the threats, we found that the three nonmigratory populations in Florida, the Caribbean, and countries in Central America are at risk due to unsuitably high temperatures associated with climate change. There is potential for nonmigratory monarch populations in North America to be demographic sinks (see Crone and Schultz 2021, p. 1536), requiring continual influxes of monarchs from migratory populations to sustain them. Therefore, the status of nonmigratory monarchs in the North American portion is also in decline.

After assessing the best scientific and commercial data available, we found that migratory monarch butterflies in North America, which represent the vast majority of monarch butterflies worldwide, have a high likelihood of becoming extirpated in 60 years. Therefore, we conclude that the monarch butterfly is likely to become in danger of extinction within the foreseeable future throughout North America. Therefore, having determined that the North America portion is both (1) significant; and (2) likely to become in danger of extinction within the foreseeable future, we conclude that the monarch butterfly is in danger of extinction within the foreseeable future within a significant portion of its range. This is consistent 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).

Determination of Status

Based on the best scientific and commercial data available, we determine that the monarch butterfly meets the Act's definition of a threatened species. Therefore, we propose to add the monarch butterfly as a threatened species to the List of Endangered and Threatened Wildlife in 50 CFR 17.11(h) 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 calls for the Service to develop and implement recovery plans for the conservation of endangered and threatened species. The goal of this process is to restore listed species to a point where they are secure, self-sustaining, and functioning components of their ecosystems.

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

Headquarters (see **FOR FURTHER INFORMATION CONTACT**).

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

To improve future conditions so that the monarch migratory populations stabilize and grow, we need to (1) achieve a significant increase in the availability of milkweed and nectar plants in monarch breeding and migratory areas; (2) protect and enhance overwintering habitat; (3) avoid and minimize impacts to monarchs and their habitat from insecticides and herbicides; and (4) maintain public support for the conservation of monarch butterflies. Because of the monarch butterfly's general habitat use and wide distribution, all sectors of society, including the general public, have an opportunity to participate in a broad range of conservation efforts throughout the species' range.

If this species is listed, funding for recovery actions will be available from a variety of sources, including Federal budgets, State programs, and cost-share grants for non-Federal landowners, the academic community, and nongovernmental organizations. In addition, pursuant to section 6 of the Act, the States of Alabama, Arizona, Arkansas, California, Colorado, Connecticut, Delaware, Florida, Georgia, Hawaii, Idaho, Illinois, Indiana, Iowa, Kansas, Kentucky, Louisiana, Maine, Maryland, Massachusetts, Michigan, Minnesota, Mississippi, Missouri, Montana, Nebraska, Nevada, New Hampshire, New Jersey, New Mexico, New York, North Carolina, North Dakota, Ohio, Oklahoma, Oregon, Pennsylvania, Rhode Island, South Carolina, South Dakota, Tennessee, Texas, Utah, Vermont, Virginia, Washington, West Virginia, Wisconsin, and Wyoming; the U.S. Commonwealths of the Northern Mariana Islands and Puerto Rico; and the U.S. Territories of American Samoa, Guam, and the U.S. Virgin Islands would be eligible for Federal funds to implement management actions that promote the protection or recovery of the monarch butterfly. 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 monarch butterfly 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 adversely modify critical habitat. Regulations implementing section 7 are codified at 50 CFR part 402.

Section 7(a)(1) directs all Federal agencies, in consultation with the Secretary, to utilize their authorities to carry out ''programs for the conservation of endangered and threatened species.'' This provision provides an affirmative and broad mandate to all agencies to take action to conserve threatened and endangered species. This section affords broad discretion to agencies on the measures they undertake as part of their conservation programs within their existing authorities, and robust section 7(a)(1) programs may assist Federal agencies with their obligations under section 7(a)(2). 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 monarch butterfly that may be subject to conference and consultation procedures under section 7 are management of Federal lands administered by the Army Corps of Engineers, Bureau of Land Management, Department of Defense (DoD), National Park Service, Office of Surface Mining, and U.S. Forest Service 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 Federal Highway Administration, Federal Aviation Administration, U.S. Department of Agriculture, or the Federal Emergency Management Agency. We also anticipate conferencing or consultation by the EPA as part of their pesticide registration actions under FIFRA. Federal actions not affecting listed species or critical habitat—and actions on State, Tribal, local, or private lands that are not federally funded, authorized, or carried out by a Federal agency—do not require section 7 consultation. Federal agencies should coordinate with the local Service Field Office or Midwest Region Headquarters (see **FOR FURTHER INFORMATION CONTACT**) with any specific questions on section 7 consultation and conference requirements.

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

Background

Section 4(d) of the Act contains two sentences. The first sentence states that the Secretary shall issue such regulations as she deems necessary and advisable to provide for the conservation of species listed as threatened 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, and even broader authority to put in place any of the section 9 prohibitions, for a given species.

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

The provisions of this species' proposed protective regulations under section 4(d) of the Act are one of many tools that we would use to promote conservation of the monarch butterfly by encouraging creation and management of habitat in ways that address threats to the species and maintain public support for its conservation. To achieve a significant increase in the availability of milkweed and nectar plants in monarch breeding areas, we need to incentivize return of milkweed to large portions of the landscape where it is now nonexistent or where what remains is highly fragmented. Given that so much milkweed has been lost historically and that monarchs are impacted by the ongoing effects of this past habitat loss and degradation, we need an approach that encourages landowners to add milkweeds and nectar plants and implement actions to maintain them. Creation, enhancement, and maintenance of higher quality habitat by the public may lead to the temporary destruction of milkweed and nectar plants and incidental take of monarchs. Private landowner and general public support are crucial because the species is wide-ranging and needs broad conservation action, from small- to large-scale efforts, throughout its range. Conservation for the species can occur on land parcels ranging from quite small to very large, including gardens, parks, grasslands, agricultural areas, and more. Because of the monarch butterfly's general habitat use and wide distribution, all sectors of society, including the general public, have an opportunity to participate in a broad range of conservation efforts throughout the species' range. The proposed 4(d) rule allows for the general public to take action to participate in the recovery of monarchs without fear of unintentional violation for the Act. Public action is necessary for the conservation of the species.

The proposed protective regulations would apply only if and when we make final the listing of the monarch butterfly as a threatened species. Nothing in 4(d) rules changes in any way the recovery planning provisions of section 4(f) of the Act, the consultation requirements under section 7 of the Act, or the ability of the Service to enter into partnerships for the management and protection of the monarch butterfly.

As mentioned previously in Available Conservation Measures, section 7(a)(2) of the Act requires Federal agencies, including the Service, to ensure that any action they authorize, fund, or carry out is not likely to jeopardize the continued existence of any endangered species or threatened species or result in the destruction or adverse modification of designated critical habitat of such species. 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 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 (under application of a ''blanket rule'' (for more information, see 89 FR 23919, April 5, 2024) or a species-specific 4(d) rule). A 4(d) rule does not change the process and criteria for informal or formal consultations and does not alter the analytical process used for biological opinions or concurrence letters. For example, as with an endangered species, if a Federal agency determines that an action is ''not likely to adversely affect'' a threatened species, this will require the Service's written concurrence (50 CFR 402.13(c)). Similarly, if a Federal agency determinates 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)). 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; streamlined, 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. Nonetheless, section 7(a)(1) authority provides a great deal of unrealized potential in achieving recovery goals, and this 4(d) rule incentivizes agencies to fully utilize their authorities to design and implement conservation programs that meaningfully benefit monarch butterflies.

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 monarch butterfly's conservation needs. As discussed previously in Summary of Biological Status and Threats, we have concluded that the monarch butterfly is likely to become in danger of extinction within the foreseeable future primarily due to the ongoing impacts of loss and degradation of breeding, migratory, and overwintering habitat (from past conversion of grasslands and shrublands to agriculture and widespread use of herbicides; logging/thinning at overwintering sites in Mexico; urban development, senescence, and

incompatible management of overwintering sites in California; and drought), exposure to insecticides, and effects of climate change. Section 4(d) requires the Secretary to issue such regulations as she deems necessary and advisable to provide for the conservation of each threatened species and authorizes the Secretary to include among those protective regulations any of the prohibitions that section 9(a)(1) of the Act prescribes for endangered species. We are not required to make a ''necessary and advisable'' determination when we apply or do not apply specific section 9 prohibitions to a threatened species (In re: Polar Bear Endangered Species Act Listing and 4(d) Rule Litigation, 818 F. Supp. 2d 214, 228 (D.D.C. 2011) (citing *Sweet Home Chapter of Communities for a Great Oregon* v. *Babbitt,* 1 F.3d 1, 8 (D.C. Cir. 1993), *rev'd on other grounds,* 515 U.S. 687 (1995))). Nevertheless, even though we are not required to make such a determination, we have chosen to be as transparent as possible and explain below why we find that, if finalized, the protections, 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 monarch butterfly.

The protective regulations we are proposing for the monarch butterfly incorporate prohibitions from section 9(a)(1) to address the threats to the species. The prohibitions of section 9(a)(1), and the implementing regulations codified at 50 CFR 17.21, make it illegal for any person subject to the jurisdiction of the United States to commit, to attempt to commit, to solicit another to commit or to cause to be committed any of the following acts with regard to any endangered wildlife: (1) import into or export from, the United States; (2) take (which includes harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, 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 all these prohibitions because the eastern and western North America monarch populations are at risk of extinction within the foreseeable future and putting these prohibitions in place will help to prevent further declines, slow the rate of decline, and decrease negative effects from other ongoing or future threats.

In particular, this proposed 4(d) rule would provide for the conservation of the monarch butterfly by prohibiting the following activities, unless they fall within specific exceptions or are otherwise authorized or permitted: importing or exporting; take; possession and other acts with unlawfully taken specimens; delivering, receiving, carrying, transporting, or shipping in interstate or foreign commerce in the course of commercial activity; or selling or offering for sale in interstate or foreign commerce. We are proposing to prohibit these activities in the contiguous United States, Puerto Rico, and the U.S. Virgin Islands. We are not proposing to prohibit these activities in Hawaii or other U.S. Territories because these areas are outside the historical range of the species and monarchs in these areas will not contribute to recovery of the species in North America. We are also not proposing to prohibit these activities in Alaska because the species does not occur there. Further, import and interstate movement of monarch butterflies is regulated by the U.S. Department of Agriculture, and monarchs may not be transported to Hawaii, Alaska, or any of the U.S. Territories under existing regulations in 7 CFR part 330.

Under the Act, ''take'' means to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct. Some of these provisions have been further defined in regulations at 50 CFR 17.3. Take can result knowingly or otherwise, by direct and indirect impacts, intentionally or incidentally. Regulating take would help to preserve the species' migratory populations, slow their rates of decline, and decrease synergistic, negative effects from other ongoing or future threats. Therefore, we propose to prohibit take of the monarch butterfly, except for take resulting from those actions and activities specifically excepted by the 4(d) rule.

Exceptions to the prohibition on take would include all the general exceptions to the prohibition on take of endangered wildlife, as set forth in 50 CFR 17.21 and additional exceptions, as described below.

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

In addition, to further the conservation of the species, any employee or agent of the Service, any other Federal land management agency, the National Marine Fisheries Service, a State conservation agency, or a federally recognized Tribe, who is designated by their agency or Tribe for such purposes, may, when acting in the course of their official duties, take threatened wildlife without a permit if such action is necessary to: (i) Aid a sick, injured, or orphaned specimen; or (ii) dispose of a dead specimen; or (iii) salvage a dead specimen that may be useful for scientific study; or (iv) remove specimens that constitute a demonstrable but nonimmediate threat to human safety, provided that the taking is done in a humane manner. 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.

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 monarch butterflies that may result in

otherwise prohibited take without additional authorization.

The main threats affecting the two North American migratory populations of monarch butterflies are the ongoing impacts from loss and degradation of breeding, migratory, and overwintering habitat (from past conversion of grasslands and shrublands to agriculture and widespread use of herbicides; logging/thinning at overwintering sites in Mexico; urban development, senescence; and incompatible management of overwintering sites in California; and drought), exposure to insecticides, and effects of climate change. To improve future conditions so that the monarch migratory populations stabilize and grow, we need to (1) achieve a significant increase in the availability of milkweed and nectar plants in monarch breeding and migratory areas; (2) protect and enhance overwintering habitat; (3) avoid and minimize impacts to monarchs and their habitat from insecticides and herbicides; and (4) maintain public support for the conservation of monarch butterflies.

The proposed 4(d) rule would also provide for the conservation of the species by allowing exceptions that incentivize conservation actions or that, while they may have some minimal level of take of the monarch butterfly, 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 exceptions to these prohibitions include take resulting from activities conducted for the benefit of monarch butterflies or with only de minimis impacts that may maintain, enhance, remove, or establish milkweed and nectar plants within the breeding and migratory range; implementation of a comprehensive conservation plan developed by or in coordination with a State agency or implementation of a conservation program developed by a Federal agency; maintenance or improvement of monarch overwintering habitat in the United States consistent with a site-specific Service-approved Overwintering Site Land Management Plan; monarch mortality due to vehicle strikes; small-scale (250 or fewer butterflies) collection, possession, captive-rearing, and release of monarchs; scientific research; educational activities; possession of dead monarchs; and sale of captively reared monarchs.

In this proposed rule, the range of the monarch where these exceptions would apply include all areas under the jurisdiction of the U.S. Government where the monarch occurred historically and were not aided by human dispersal (*i.e.,* the contiguous United States, Puerto Rico, and the U.S. Virgin Islands). These exceptions would not apply to States that are not part of the contiguous United States (*e.g.,* Hawaii) or territories that are outside the historical range of the species (*e.g.,* American Samoa) because, as noted above, these activities would not be prohibited there.

(1) Activities that may maintain, enhance, remove, or establish milkweed and nectar plants within the breeding and migratory range that do not result in conversion of native or naturalized grassland, shrubland, or forested habitats.

These activities include the following:

(a) Habitat restoration and management activities, such as mowing and haying native rangeland, that sustain monarch butterfly habitat, including activities to eliminate plant communities that contain invasive plants or noxious weeds as part of site preparations or habitat enhancement activities.

(b) Livestock grazing and routine ranching activities, including rotational grazing, patch-burn grazing, vegetation and invasive species management, other grazing practices implemented to make pasture and rangelands productive, construction and maintenance of fences, the gathering and management of livestock, and the development and maintenance of watering facilities for livestock.

(c) Routine agricultural activities, including plowing, drilling, disking, mowing, and other mechanical manipulation and management of lands already in use for agricultural production (*e.g.,* conventional row crops, pasture, hay fields, orchards, and vineyards). This also includes other mechanical manipulation and land management activities in direct support of cultivated agriculture, such as replacement, upgrades, maintenance, and operation of existing infrastructure (*e.g.,* buildings, irrigation conveyance structures, fences, and roads), and routine implementation and maintenance of agricultural conservation practices, such as terraces, dikes, grassed waterways, and conservation tillage.

(d) Fire management actions (*e.g.,* prescribed burns, cultural burns, hazardous fuel reduction activities, vegetation management, maintenance of fuel breaks and minimum clearance requirements, and other fuels reduction activities).

(e) Silviculture practices and forest management activities that use State-approved best management practices.

(f) Maintenance, enhancement, removal, and establishment of milkweed and nectar plants on residential and other developed properties.

(g) Vegetation management activities, such as mowing, ground disturbance, and other management activities, that remove milkweed and/or nectar plants when conducted at times of year when monarchs are not likely present.

We intend for this proposed exception to encourage numerous small- and large-scale projects that will increase the quality and quantity of breeding habitat on the landscape in the long term. We expect localized removal of milkweed and nectar plants will be outweighed by an overall addition of these resources across the landscape, making broadscale public support for monarch conservation vitally important. For example, landscape-scale habitat restoration and management activities that provide for the habitat needs of monarch butterflies (*e.g.,* mowing, haying native rangeland, prescribed and cultural burning, and control of invasive plants or noxious weeds) may remove milkweed and could result in take of monarchs in the short term but would also increase the overall quality and quantity of breeding habitat, which is likely to benefit monarch populations in the long term. Similarly, forest, fuels and wildland management activities, and rangeland management may have some minimal level of take of monarch butterflies but 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. These activities can help maintain and manage native, naturalized, and restored grassland, shrubland, and forested habitats, which is a conservation benefit to the species.

Routine agricultural activities on lands already in use for agricultural production, not including conversion of native or naturalized grassland, shrubland, and forested habitats, would result in loss of milkweed and nectar plants that we consider inconsequential to the conservation of the species. Monarchs are impacted by the ongoing effects of past habitat loss and degradation; therefore, routine agricultural activities on lands already in use for agricultural production will not result in significant additional habitat loss and degradation. This is also true for maintenance, enhancement, removal, or establishment of milkweed and nectar plants on residential and other developed properties. Vegetation management activities that remove milkweed and/or nectar plants when conducted at times of year when monarchs are not likely present and that

do not result in conversion of native or naturalized grassland, shrubland, or forested habitats would also result in a level of take considered inconsequential to the conservation of the species. In addition, some activities may provide both conservation benefits to the species while also contributing to an inconsequential level of take (*e.g.,* livestock grazing).

While the goal of substantially increasing the breeding habitat available to monarchs and reducing fragmentation of their habitat will require working with people in many different sectors, a high priority needs to be placed on working with farmers as well as the Natural Resources Conservation Service, Farm Service Agency, and other partners who work with private landowners. We will especially focus on the key monarch breeding and migratory areas to encourage support for voluntary efforts to create suitable habitat and improve connectivity of these habitat patches to increase the productivity of monarchs and increase the carrying capacity of monarch habitat on the landscape in important parts of the species' range.

Under this proposed 4(d) rule, incidental take caused by activities that may maintain, enhance, remove, or establish milkweed and nectar plants within the breeding and migratory range that do not result in conversion of native or naturalized grassland, shrubland, or forested habitats will not be prohibited. These exceptions to the prohibitions are intended to encourage widespread adoption of voluntary milkweed and nectar restoration and maintenance as well as reduce the regulatory requirements for the public on forms of take that are considered inconsequential to the conservation of the species.

(2) Implementation of comprehensive conservation plans and programs.

When making a determination as to whether incidental take from implementation of a conservation plan or program would be excepted pursuant to this 4(d) rule, we would consider the following:

- Whether the plan comprehensively addresses the threats affecting the monarch within the plan area;
- Whether the plan establishes objective, measurable biological goals and objectives for population and habitat necessary to ensure a net conservation benefit, and provides the mechanisms by which those goals and objectives will be achieved;
- Whether the plan administrators demonstrate the capability and funding mechanisms for effectively implementing all elements of the plan, including enrollment of participating landowners, monitoring of activities, and enforcement of plan requirements, as applicable;
- Whether the plan employs an adaptive management strategy to ensure future program adaptation as necessary and appropriate; and
- Whether the plan includes appropriate monitoring of effectiveness and compliance.

To achieve a significant increase in the availability of monarch breeding areas that is required for improvement in the status of the species, breeding habitat needs to be returned to large portions of the landscape where it is now nonexistent or where what remains is highly fragmented. Given that so much milkweed has been lost historically and that monarchs are impacted by the ongoing effects of this past habitat loss and degradation, we need an approach that encourages landowners to add milkweeds and nectar plants and implement actions to maintain them, and comprehensive plans and projects to conserve the monarch butterfly could be important sources of that conservation across the broader landscape. State-wide plans developed by or in coordination with States and implemented by State agents and enrolled participants (*e.g.,* private landowners, local governments) are opportunities for large-scale conservation. Likewise, programs developed by Federal agencies in fulfillment of their section 7(a)(1) responsibilities are also opportunities for large-scale conservation. Therefore, we intend for this proposed exception to encourage implementation of conservation plans and programs that comprehensively address threats affecting the monarch within the plan area.

(3) Maintenance or improvement of overwintering habitat.

Overwintering habitat is defined as habitat that provides overwintering monarch butterflies with the abiotic and biotic conditions necessary for clustering, aggregating, and feeding (nectaring). An overwintering site is defined as an area where migratory monarch butterflies cluster on trees during the fall and/or winter. Unlike breeding habitat, which is widely dispersed across the continental United States and can be quickly created in a variety of locations, overwintering habitat in Mexico (for the eastern migratory population) and California (for the western migratory population) is usually restricted to specific areas and consists of tree groves that are not easily created in new locations. Migratory monarchs require a very specific microclimate at overwintering sites. Maintenance and improvement of overwintering habitat will aid conservation and recovery of the species by maintaining and enhancing those specific conditions at existing groves. We do not regulate take in foreign countries; therefore, we do not prohibit incidental take resulting from management, including logging, of monarch overwintering habitat in Mexico. Our proposed 4(d) exceptions apply only to incidental take resulting from maintenance or improvement of monarch overwintering habitat in California or elsewhere in the United States. Under this proposed 4(d) rule, incidental take resulting from maintenance or improvement of monarch overwintering habitat in the United States that is consistent with the goals and objectives of a site-specific Service-approved overwintering site land management plan at the site would not be prohibited. Our current Overwintering Site Land Management Plan template and an example plan are available on *https://www.regulations.gov* under Docket No. FWS–R3–ES–2024–0137.

(4) Vehicle strikes.

It is common for monarchs to be struck by vehicles and killed in the course of normal driving activities. Research suggests there may be roadkill hotspots where monarch vehicle mortality is particularly high, especially during periods of migration (Kantola et al. 2019, pp. 153 and 158). The best available information shows that mortality due to vehicle strikes is not one of the primary drivers of changes in monarch populations, and it was not identified as a primary driver by monarch experts (Service 2024a, p. 39). At this time the impacts from monarch deaths due to vehicle strikes are considered minimal and not affecting the monarch butterfly at a population or species level. Furthermore, research suggests that roadside monarch habitat can still provide a net benefit to the species, despite losses due to collisions, through strategic improvements to roadside vegetation management (Kasten et al. 2016, entire; Phillips et al. 2019, entire). Habitat along roadsides may provide milkweed and nectar resources in otherwise heavily developed and agricultural regions, as well as provide needed habitat connectivity across the landscape (Wu-Smart & Schacht 2019, entire; Ding & Eldridge 2022, entire).

We conclude that the overall impact of vehicle strikes is not expected to negatively affect conservation and recovery efforts for the monarch butterfly. Therefore, we propose that

take due to vehicle strikes not be prohibited under this 4(d) rule.

(5) Non-lethal collection, possession, captive-rearing, and release of a limited number of monarchs.

Monarch butterflies are collected non-lethally, held in captivity (and in some cases sold), and released for a variety of purposes, including educational purposes. Collecting (defined in this rulemaking as the non-lethal capture and holding of live monarchs at any life stage), captively rearing (defined in this rulemaking as the holding of caterpillars, pupae, or adults and raising them in captivity long enough for them to move to the next life stage or to reproduce), and releasing monarchs has inspirational and educational value and can foster lifelong connections to nature. Collection of monarchs at any life stage from the wild has the potential to pose a risk to population numbers. After evaluating the threat of collection, we determined there is no evidence that the current rate of collection, in combination with the current rate of release, is affecting monarch populations (Service 2024a, p. 109). However, we assume that the collection of clustering monarchs could have greater impacts to the populations and species' viability, as the migratory populations are at their smallest when monarchs are clustering and overwintering clusters contain concentrated numbers of individuals; thus, wild clustering monarchs may not be collected as part of this exception.

Captive-rearing can also pose risks to wild monarch populations, such as through the spread of diseases and loss of genetic diversity (Altizer et al. 2015, p. 1), and potential negative effects to the fitness of individuals and their migratory capabilities (Altizer et al. 2015, p. 2). The negative effects can greatly impact wild monarch populations when rearing is conducted on a large scale (Altizer et al. 2015, pp. 1–3). However, captive-rearing on a small scale can achieve all the inspirational and educational benefits while reducing the risk of negatively affecting populations, particularly if protocols are followed to minimize disease and genetic impacts. For the purposes of this proposed rule, we describe small-scale captive-rearing as collection, raising, and releasing 250 or fewer monarchs in a given year. We consider the collection, raising, and releasing of more than 250 monarchs per year to be a large-scale endeavor, for which a permit would be required through section 10(a)(1)(A) of the Act.

We conclude that the overall impact of collecting, possessing, captively rearing, and releasing 250 or fewer individual monarchs at one location or facility (*e.g.,* home, botanical garden, school, or business) is not expected to negatively affect conservation and recovery efforts for the monarch butterfly. Therefore, take due to these activities would not be prohibited under this proposed 4(d) rule. However, collection of clustered monarchs would be prohibited. Clustered monarchs are typically the individuals that will produce the next year's first migratory generation. The migratory populations are at their smallest during the overwintering time period when monarchs cluster (typically September through March), and it is especially important that these individuals survive the winter to breed in the spring. Therefore, our proposed exception does not include take resulting from handling or collection of clustered monarchs; a permit to do so would be required through section 10(a)(1)(A) of the Act.

(6) Non-lethal scientific research and educational activities involving a limited number of monarchs.

Future scientific research on monarch butterflies and their use in educational activities in the contiguous United States will aid conservation and recovery by leading to a better understanding and appreciation of the biology and ecology of the species. Activities associated with scientific research and education may include non-lethal collection for purposes of handling, netting, sampling for disease, tagging of monarchs, and conducting life cycle and specimen observations of captive monarchs. The same restrictions related to possession and release of monarchs (*i.e.,* limiting activities to 250 or fewer monarchs per year) would apply to scientific research and educational activities. To encourage continued and further scientific research and educational activities, we are proposing to include exceptions in the 4(d) rule that allow these activities without requiring additional permits; however, we do not include take of clustered monarchs in the exception. As discussed in the previous section, it is especially important that clustered overwintering monarchs survive the winter to breed in the spring. Therefore, we do not include handling or collection of clustered monarchs for scientific research from this exception; a permit to do so would be required through section 10(a)(1)(A) of the Act.

(7) Possession of dead monarchs.

Though overwintering monarchs can live longer, the average life expectancy of monarchs during the breeding season is 2 to 5 weeks. It is common for people to find and collect dead adult monarchs or pieces of wing. Collection and possession of this type is not currently a threat to the species. In some cases, with other species, we might be concerned about collection becoming a threat due to collectors capturing live butterflies and preserving them because the species is listed and likely to become more rare. However, the monarch has historically occurred in such large numbers and across such a large range that the species is already a common specimen in butterfly collections. The potential impacts from collection and possession of dead monarchs are considered minimal and not likely to affect the monarch butterfly at a population or species level. Collection of live wild adult monarchs and intentionally killing them for preservation purposes would be prohibited. We are proposing in this 4(d) rule that possession of dead monarchs collected in a lawful manner would not be prohibited.

(8) Sale of captively reared monarchs.

We propose to limit the sale of captively reared monarchs to 250 or fewer individuals per year from a single location or facility. It is common for individuals and organizations such as garden groups, schools, and small businesses to sell captively reared monarchs during the breeding season. These activities provide inspirational and educational value for the public but have the same risks as discussed above. We find that if these activities are conducted on a small scale (limited to 250 or fewer monarchs in a given year), the potential for negative impacts would be minimal.

We conclude that the overall impact of selling 250 or fewer individual monarchs at one location or facility (*e.g.,* home, botanical garden, school, or business) is not expected to negatively affect conservation and recovery efforts for the monarch butterfly. Therefore, take due to these activities would not be prohibited under this proposed 4(d) rule.

Public Comment Requested on Exception for Pesticide Use

We seek public comment on how to address pesticide use under a 4(d) rule for the monarch. We recognize that certain types of pesticide use can have direct or indirect negative effects on monarchs, including aerial broadcast application of insecticides, use of herbicides that remove milkweeds, and use of some biopesticides. However, not all uses and application methods will impact monarchs. For example, insecticide application using hand-held sprayers, soil injection, in furrow sprays, tree trunk drenching, or tree injection, are unlikely to result in

pesticide exposure to monarchs. We seek comment on which pesticide uses and application methods result in exposure and adverse effects to monarchs, whether to except take from those uses in a 4(d) rule, and whether the exceptions for those uses should include measures to mitigate the effects of pesticides on monarchs. We also seek comment on whether we should tailor any measures according to the areas and times of the year when monarchs are present and, if so, what is the most feasible method to convey this information to pesticide users. Further, any measures should focus on minimizing impacts to monarchs by reducing exposure to the species, but we also seek comment on whether it is appropriate to offset unavoidable impacts such as through habitat restoration and, if so, how to accomplish this in a 4(d) rule.

If we include mitigation measures for excepted uses and application methods in a 4(d) rule, we also seek comment on how to align those measures with the EPA's work under FIFRA to minimize the effects of pesticides on listed species and to ensure that FIFRA registration and registration review decisions comply with section 7(a)(2) (see *Conservation Efforts and Regulatory Mechanisms,* above). FIFRA, not the ESA, is the primary Federal law that determines the conditions under which pesticides may be used. Given all the EPA's ongoing work to address pesticide impacts on listed species (*e.g.,* Herbicide Strategy, Insecticide Strategy, Vulnerable Species Action Plan), we seek to minimize confusion and regulatory burdens for pesticide users as a result of any mitigation measures we may include in a 4(d) rule for any excepted pesticide uses. Rather than include specific pesticide mitigation measures in the proposed 4(d) rule, we seek comment on how best to identify those measures in a manner that aligns with the EPA's ongoing work on this issue.

To inform public comments, we provide additional information on certain pesticide uses that impact monarchs. Many insecticides are a threat to monarchs based on their mode of action to target insects and their potential exposure to monarchs. Conventional insecticides have active ingredients used to control insects by killing or otherwise preventing them from engaging in behaviors that are undesirable or destructive. Insecticides are used in areas where monarchs occur and can drift off intended use sites with certain methods of application. They are likely to cause lethal and sublethal effects to nontarget lepidopterans (*i.e.,* the order of insects that includes butterflies and moths) that are exposed (Service 2024a, appendix 5). Even though monarchs are not typically the target of insecticides, they can be killed by these chemicals if they are incidentally exposed. Many conventional insecticides have nonspecific modes of action and are expected to result in mortality to most or all insect species when exposure exceeds a certain threshold.

In contrast, biopesticides are typically less toxic than conventional pesticides and generally affect only the specific target insect pest and closely related organisms. Biopesticides include naturally occurring substances that control pests by nontoxic mechanisms (*e.g.,* biochemical pesticides), microorganisms that control pests (*e.g.,* microbial pesticides), and pesticidal substances produced by plants containing added genetic material (*e.g.,* plant-incorporated protectants). While application of most biopesticides is not expected to affect monarchs, certain forms of the microbial pesticide *Bacillus thuringiensis* (*Bt*) are active against lepidopterans. Lepidoptera-active *Bt* strains produce a specific mix of insecticidal proteins that are active against caterpillars due to taxa-specific biological properties and are used to control pests such as the spongy moth. At present, Lepidoptera-active strains include *Bacillus thuringiensis kurstaki* (*Btk*) and *Bacillus thuringiensis azawai* (*Bta*), though additional Lepidoptera-active *Bt* products may be registered in the future. Other currently registered *Bt* products, such as *Bacillus thuringienses israelensis* (*Bti*), are not active against Lepidoptera and thus are not expected to cause negative effects to monarchs. Products incorporated with *Bt,* such as *Bt*-corn, are also not expected to cause negative effects to monarchs because the toxin expression in *Bt*-corn is limited to pollen, where it occurs at such low concentrations that exposure presents a low risk to monarchs. In addition to direct exposure to insecticide residues from spray application, monarchs may be exposed via diet to systemic insecticides that are absorbed by nectar and milkweed plants from the soil and become incorporated into tissues (*e.g.,* leaves, flowers, pollen, and nectar). While numerous types of insecticides may be incorporated into plants systemically, neonicotinoids are a class of insecticides that is particularly known to distribute throughout plant tissues in this manner. Laboratory studies demonstrate that exposure to neonicotinoids can negatively affect adult, larval, and pupal survival of monarchs. However, concentrations of neonicotinoids in the environment from systemic incorporation have not been found to reach levels known to elicit the negative effects seen in laboratory studies.

Another application of systemic insecticides is the direct application or coating of seeds with insecticides prior to planting to control or repel disease organisms, insects, and pests that attack crops or desirable plants. Because seeds are broadly treated and often used prophylactically (*i.e.,* not in response to a documented pest outbreak), their use is widespread for certain crops. Insecticide applications by wet or liquid seed-coatings and slurry seed treatment create limited exposure pathways to the monarch. Dust-treated seed applications incur a potential for the dust to drift at the time of planting. Treated seed dust could drift off the field, exposing monarchs by direct contact with the insecticide or from systemic incorporation into nearby milkweed or nectar plants. However, the exposure potential to the monarch from treated seeds is orders of magnitude lower compared to exposure potential from aerial broadcast applications, and concentrations of insecticides detected in pollen and nectar following seed treatments are below known thresholds for negative effects in monarchs (Beedle and Harbin 2011, p. 8; EPA 2016, pp. 14–22; EPA 2020, pp. 87–88).

Other pesticide formulation types, in contrast to liquid forms that can result in direct exposure, are less likely to lead to exposure of monarchs through contact or dietary routes and are therefore not expected to negatively affect monarchs. For example, solid forms of pesticides, such as granules or baits, are applied directly to the soil or turf grass typically by hand or a spreader specifically designed for the size of the carrier particle and provide little opportunity for contact with monarch adults or larvae. In addition, solid formulations are not expected to result in drift.

For other pesticide classes, such as herbicides and fungicides, our review of the scientific information available indicates a limited number of individual monarchs will experience negative effects from direct exposure to these pesticides. We do not expect the low number of individuals affected from direct exposure to other classes of pesticides to impact the monarch butterfly at a population or species level. Certain herbicide uses, however, have resulted in the loss of milkweed and nectar, which is discussed in the *Activities that may maintain, enhance, remove, or establish milkweed and*

nectar plants within the breeding and migratory range that do not result in conversion of native or naturalized grassland, shrubland, or forested habitats section. As a result, we are considering what mitigation measures, if any, from the EPA's Herbicide Strategy (EPA 2024a, entire) and the agency's other ESA work (EPA 2024b, entire; EPA 2024c, entire), should inform any exceptions for herbicide use in a 4(d) rule for the monarch. Further, the EPA is considering how habitat restoration and other forms of compensatory mitigation may address unavoidable pesticide impacts to listed species. We thus seek comment on whether and how we should consider habitat restoration or creation as an offset for unavoidable pesticide impacts to the monarch under a 4(d) rule.

Summary

To promote conservation of monarch butterflies in the contiguous United States, we need to (1) achieve a significant increase in the availability of milkweed and nectar plants in monarch breeding and migratory areas; (2) protect and enhance overwintering habitat; (3) avoid and minimize impacts to monarchs and their habitat from insecticides and herbicides; and (4) maintain public support for the conservation of monarch butterflies. Therefore, we focus our efforts in this proposed 4(d) rule on incentivizing known beneficial actions for the species, as well as reducing the regulatory requirements for the public on forms of take that are considered inconsequential to the conservation of the species in the contiguous United States, Puerto Rico, and the U.S. Virgin Islands. These exceptions would not apply to States or territories that are outside the historical range of the species because the excepted activities would not be prohibited there.

We find that the activities resulting in take that are excepted by this proposed 4(d) rule will have a de minimis impact to the species and will promote conservation and recovery of monarch butterflies in the contiguous United States. The following activities are expected to result in low levels of take of individuals or will aid conservation and recovery of the species: activities that may maintain, enhance, remove, or establish milkweed and nectar plants within the breeding and migratory range; implementation of a comprehensive conservation plan developed by or in coordination with a State agency or implementation of a conservation program developed by a Federal agency; maintenance or improvement of monarch overwintering habitat in the United States consistent with a site-specific Service-approved Overwintering Site Land Management Plan; monarch mortality due to vehicle strikes; small-scale (250 or fewer butterflies) collection, possession, captive-rearing, and release of monarchs; scientific research; educational activities; possession of dead monarchs; and sale of captively reared monarchs. In order to identify how the effects of these activities on monarch butterflies may differ from our current understanding and what additional activities we should consider excepting in a 4(d) rule, we are requesting additional information on the exceptions in this proposed 4(d) rule. We specifically request public comments on how to address pesticide use under a 4(d) rule for the monarch. To submit information, see the Information Requested section.

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 consults with the Service under section 7(a)(2) of the Act. If the action may affect the listed species itself (such as for occupied critical habitat), the Federal agency would have already been required to consult with the Service even absent the designation because of the requirement to ensure that the action is not likely to jeopardize the continued existence of the species. Even if the Service were to conclude after consultation that the proposed activity is likely to result in destruction or adverse modification of the critical habitat, the Federal action agency and the landowner are not required to abandon the proposed activity, or to restore or recover the species; instead, they must implement ''reasonable and prudent alternatives'' to avoid destruction or adverse modification of critical habitat.

Under the first prong of the Act's definition of critical habitat, areas within the geographical area occupied by the species at the time it was listed are included in a critical habitat designation if they contain physical or biological features (1) which are essential to the conservation of the species and (2) which may require special management considerations or protection. For these areas, critical

habitat designations identify, to the extent known using the best scientific 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 from the SSA report and information developed during the listing process for the species. Additional information sources may include any generalized conservation strategy, criteria, or outline that may have been developed for the species; the recovery plan for the species; articles in peer-reviewed journals; conservation plans developed by States and counties; scientific status surveys and studies; biological assessments; other unpublished materials; or experts' opinions or personal knowledge.

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

Physical or Biological Features Essential to the Conservation of the Species

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

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

Recovery of monarch butterflies will require maintaining and, where necessary, improving habitat across the range to ensure the long-term viability of the species. The physical or biological features that are essential to the conservation of the species and which may require special management considerations or protection are a subset of the habitat across the range necessary for species recovery. We have determined that the areas occupied by the monarch butterfly during the winter are the subset of habitat across the range needed for recovery that are essential to the conservation of the species (Service 2024b, entire). Monarchs exhibit high annual site fidelity, densely cluster at these sites, and are especially vulnerable to their environment (*e.g.,* severe storm events, temperature fluctuations, predation, etc.) during the overwintering phase of their life cycle. Because we do not designate critical habitat outside of the United States, we are only designating overwintering habitat in the United States and not designating any areas used by migratory monarchs for overwintering in Mexico or elsewhere.

We are not proposing to designate critical habitat within monarch butterfly breeding and migratory areas or in areas used by nonmigratory monarchs in the winter. Although breeding and migratory habitats are important and support the species' life cycle, this kind

of habitat in North America is broad and spatially diffuse. The specific geographic areas that contain essential breeding and migratory habitat can change in relatively short timeframes due to many reasons, including weather conditions, natural succession, disturbance, and habitat creation. The breeding habitats used by nonmigratory monarchs in the winter (*e.g.,* southern Florida, Gulf Coast, southern Atlantic Coast, and southern Pacific Coast) have the same characteristics of being expansive in nature, having variability in the suitability of specific locations from year to year, and being used by monarchs opportunistically. Due to the expansive nature of the habitat (existing and potential), the variability in the suitability of specific locations from year to year, and the opportunistic nature of monarch habitat use, we are not proposing to designate critical habitat in breeding and migratory areas.

Migratory monarchs in the western population primarily overwinter in groves along the coast of California and Baja California (Jepsen and Black 2015, p. 149). These groves are populated by a variety of tree species, including blue gum eucalyptus (*Eucalyptus globulus*), Monterey pine (*Pinus radiata*), and Monterey cypress (*Hesperocyparis macrocarpa*) (Griffiths and Villablanca 2015, pp. 41, 46–47), all of which act as roost trees. These groves provide indirect sunlight for the overwintering monarchs, sources of moisture for hydration, defense against freezing temperatures, and protection against strong winds (Tuskes and Brower 1978, p. 149; Leong 1990, pp. 908–910, Leong 1999, p. 213). The close proximity to the coast (average distance of 1.47 mi (2.37 km) also provides a mild winter climate (Leong et al. 2004, p. 180).

To support overwintering western monarchs, we identified a support zone, which is an area of overwintering habitat surrounding an overwintering site that provides essential resources for monarchs, such as nectar plants, hydration sources, and protective landscape features that lessen the impacts from prevailing winds on groves of trees. Support zones contain the nectar resources close to the overwintering site (within 152 m (500 ft) of the shelter zone and core zone).

Summary of Essential Physical or Biological Features

We derive the specific physical or biological features essential to the conservation of the monarch butterfly from studies of the species' habitat, ecology, and life history as described below. Additional information can be found in the SSA report (Service 2024a, entire; available on *https://www.regulations.gov* under Docket No. FWS–R3–ES–2024–0137). We have determined that the following physical or biological features are essential to the conservation of the monarch butterfly:

1. Groves of trees (*e.g.,* blue gum eucalyptus, Monterey pine, Monterey cypress, Coast redwood, coast live oak, Douglas fir, Torrey pine, western sycamore, bishop pine) that serve as sites for overwintering monarchs to cluster along the coast of California.

2. Trees, herbaceous or shrubby vegetation, and/or topography surrounding overwintering groves that contribute to the following microclimate conditions:

a. Indirect or dappled sunlight,

b. Water sources (*e.g.,* stream, pond, moist soil) for hydration,

c. Defense against freezing temperatures, and

d. Protection from strong winds.

3. Supportive features nearby (*i.e.,* within 152 m (500 ft) of) overwintering groves, including the following:

a. Flowering plants for nectar,

b. Water sources (*e.g.,* stream, pond, moist soil) for hydration, and

c. Protective landscape features (*e.g.,* topography and vegetation that lessen the impacts of prevailing winds on groves of trees.

Special Management Considerations or Protection

When designating critical habitat, we assess whether the specific areas within the geographical area occupied by the species at the time of listing contain features which are essential to the conservation of the species and which may require special management considerations or protection. The features essential to the conservation of the monarch butterfly may require special management considerations or protection to reduce the following threats: the ongoing impacts of loss and degradation of breeding, migratory, and overwintering habitat and the effects of climate change.

Special management considerations or protection may be required within critical habitat areas to address these threats. Management activities that could ameliorate these threats include, but are not limited to, protecting overwintering habitats and maintaining the tree groves and the surrounding habitat; protecting and maintaining landscape features that contribute to the microclimate conditions of groves; proactively planting trees and shrubs or removing and replacing dead trees, where appropriate, to support long-term habitat suitability of overwintering sites; restoring or enhancing nectar habitat near overwintering areas using native, insecticide-free plants; reducing fuel loads and minimizing the risk of catastrophic wildfire within overwintering habitat through selective thinning; avoiding use of pesticides near overwintering sites or nectar habitat when monarchs may be present; and minimizing the likelihood that development projects will impact the quality or quantity of the habitat.

Criteria Used To Identify Critical Habitat

As required by section 4(b)(2) of the Act, we use the best scientific data available to designate critical habitat. In accordance with the Act and our implementing regulations at 50 CFR 424.12(b), we review available information pertaining to the habitat requirements of the species and identify specific areas within the geographical area occupied by the species at the time of listing and any specific areas outside the geographical area occupied by the species to be considered for designation as critical habitat. We are not currently proposing to designate any areas outside the geographical area occupied by the species because we have not identified any unoccupied areas that meet the definition of critical habitat.

Our conservation strategy and rule set for determining critical habitat for the monarch butterfly evaluated quantity and quality of areas, distribution of areas, and landscape-level considerations needed to conserve and maintain a sufficient number of overwintering sites with habitat characteristics to support high population resiliency and redundancy over time across the core overwintering range. We also attempted to capture latitudinal diversity across the core overwintering range. Because aggregations of many individuals can moderate climatic conditions experienced by overwintering monarchs and offer some protection, we gave priority to the largest sites (*i.e.,* those having the most monarchs or largest aggregations). Overwintering sites that have consistently supported the largest overwintering aggregations through time will most likely continue to do so in the future. We propose to designate as critical habitat lands that we have determined are occupied at the time of listing (*i.e.,* currently occupied) and that contain one or more of the physical or biological features that are essential to the conservation of the species.

We selected sites for critical habitat based upon maximum occupancy rates of overwintering butterflies in California observed during the Western Monarch Count from 2013 to 2022 (see Xerces

Society 2024a, unpaginated). The criteria for selection were all overwintering sites that contained 1,000 or more butterflies during at least 3 years in the 10-year period, 5,000 or more butterflies in 1 year of the 10-year period, or 1,000 or more butterflies during at least 2 years if the sites were discovered less than 10 years ago. We consider 1,000 monarchs to be a reasonable threshold for a site to be described as large; however, we require sites to meet the large-site threshold in 2 (if there are data limitations) or 3 years to demonstrate the site is suitable for overwintering (*i.e.,* that the number observed was not an anomaly). Similarly, we require sites to meet the higher threshold of 5,000 monarchs in 1 year because 5,000 is sufficient to demonstrate sites are suitable for overwintering without needing to be repeated. We chose 10 years as the timeframe because a large portion of the overwintering sites were monitored during this period as part of the Western Monarch Count (Xerces Society 2024a, unpaginated) and 10 years is long enough to capture the variability of site use by butterflies. Additionally, the timeframe is short enough that we expect the majority of sites still maintain conditions that support large numbers of monarchs.

For each overwintering site that met the abundance criteria, we identified the size and location of the site based on mapping data collected as part of the annual Western Monarch Count (see Xerces Society 2024b, unpaginated) to identify the core and shelter zones of each site. The core zone is the general area within an overwintering site that contains the trees where monarchs cluster. The shelter zone is the larger area where trees, other vegetation, and topography provide wind protection and other microclimate conditions that support monarch clustering and/or aggregation in the core zone. We then applied a 152-meter (500-foot) buffer to identify the approximate location of the support zone surrounding each overwintering site. The support zone provides essential resources for monarchs, such as nectar plants, hydration sources, and protective landscape features that lessen the impacts from prevailing winds on groves of trees. The size of the support zone is recommended by species experts based on observations of monarch movements and overwintering resources (Xerces Society and Service 2023, entire). Each area proposed for designation as critical habitat includes the core, shelter, and support zones for one or more overwintering sites. Together, the three zones provide all of the physical and biological features essential to the conservation of monarchs at each overwintering site, though the condition of the features vary by site. The areas proposed for designation as critical habitat meet the occupancy criteria because they hosted overwintering monarchs in the recent past and over a reasonable timeframe for observation; therefore, they are considered occupied. No unoccupied areas meet the definition of critical habitat because they are unlikely to be suitable for overwintering.

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

The proposed critical habitat designation is defined by the map or maps, as modified by any accompanying regulatory text, presented at the end of this document under Proposed Regulation Promulgation.

Proposed Critical Habitat Designation

We are proposing seven units as critical habitat for the monarch butterfly. The critical habitat areas we describe below constitute our current best assessment of areas that meet the definition of critical habitat for the monarch butterfly. The areas we propose as critical habitat are within the following seven units: (1) Ventura County, (2) Santa Barbara County, (3) San Luis Obispo County, (4) Monterey County, (5) Santa Cruz County, (6) Alameda County, and (7) Marin County. Table 2 shows the proposed critical habitat units and the approximate area of each unit.

TABLE 2—PROPOSED CRITICAL HABITAT UNITS FOR MONARCH BUTTERFLY

[All proposed units are occupied by the species. Area estimates reflect all land within critical habitat unit and subunit boundaries.]

Critical habitat unit	Land ownership by type	Size of unit in acres (hectares)
1. Ventura County	Public (Local)	98 (39)
	Private	395 (160)
2. Santa Barbara County:		
Subunit 2a	Public (State, Local)	139 (56)
	Private	826 (334)
Subunit 2b	Public (State)	42 (17)
	Private	389 (158)
3. San Luis Obispo County:		
Subunit 3a	Public (State)	86 (35)
	Private	384 (155)
Subunit 3b	Public (State, Local)	365 (148)
	Private	274 (111)
Subunit 3c	Public (Federal, State, Local)	258 (105)
	Private	145 (59)
4. Monterey County	Public (State, Local)	54 (22)
	Private	150 (61)
5. Santa Cruz County	Public (Federal, State, Local)	114 (46)
	Private	175 (71)

TABLE 2—PROPOSED CRITICAL HABITAT UNITS FOR MONARCH BUTTERFLY—Continued

[All proposed units are occupied by the species. Area estimates reflect all land within critical habitat unit and subunit boundaries.]

Critical habitat unit	Land ownership by type	Size of unit in acres (hectares)
6. Alameda County	Public (Local)	54 (22)
	Private	207 (84)
7. Marin County	Public (Federal, State, Local)	53 (21)
	Private	189 (77)
Total		4,395 (1,778)

Note: Area sizes may not sum due to rounding.

We present brief descriptions of all units, and reasons why they meet the definition of critical habitat for the monarch butterfly, below. The site names and numbers listed below match those used for the Western Monarch Count, an annual survey conducted since the 1980s that is now coordinated by Mia Monroe and the Xerces Society. We use the same site names because that is how these locations are colloquially known to the public, but it is important to note that the geographic boundaries of the critical habitat units do not match the boundaries of the overwintering sites that may be found online.

Unit 1: Ventura County

Unit 1 consists of 493 ac (199 ha) in Ventura County, California, and is composed of lands in city (98 ac (39 ha)) and private ownership (395 ac (160 ha)). It includes four areas: Arrundel Barranca (site #3142), Camino Real Park (site #3143), Harmon Barranca (site #3144), and Harbor Boulevard (site #3151). Part of the areas at Harmon Barranca and Camino Real Park are owned and managed by the City of Ventura. The monarch butterfly occupies the entire unit, and the unit contains all of the physical or biological features essential to the conservation of the species.

Special management considerations or protection may be required within Unit 1 to address coastal development, unsuitable management practices in overwintering habitat, insecticide applications, herbicide applications resulting in loss of nectar sources, and impacts from climate change (*e.g.,* drought, increased storm severity, extreme temperatures). Management activities, such as incompatible tree trimming or removal, nectar plant removal, and tropical milkweed planting, have the potential to impact the suitability of overwintering habitat used by monarchs in Unit 1. Special management focused on maintaining and/or enhancing the monarch overwintering groves, vegetation and/or topography that surround the groves, and habitat features nearby that support overwintering monarchs will benefit the physical or biological features essential to the conservation of the species in this unit.

Unit 2: Santa Barbara County

Unit 2 consists of two subunits in Santa Barbara County, California. The monarch butterfly occupies each of the subunits in this unit, and the subunits contain all of the physical or biological features essential to the conservation of the species.

Special management considerations or protection may be required within Unit 2 to address coastal development, unsuitable management practices in overwintering habitat, insecticide applications, herbicide applications resulting in loss of nectar sources, and impacts from climate change (*e.g.,* drought, increased storm severity, extreme temperatures). Management activities, such as incompatible tree trimming or removal, nectar plant removal, and tropical milkweed planting, have the potential to impact the suitability of overwintering habitat used by monarchs in Unit 2. Special management focused on maintaining and/or enhancing the monarch overwintering groves, vegetation and/or topography that surround the groves, and habitat features nearby that support overwintering monarchs will benefit the physical or biological features essential to the conservation of the species in this unit.

Subunit 2a consists of 964 ac (390 ha) and is composed of lands in city (123 ac (50 ha)), county (1 ac (less than 1 ha)), State (14 ac (6 ha)), and private or other ownership (825 ac (334 ha)). It includes the following areas: Las Varas Ranch (site #2741), Ellwood/Sandpiper Golf Course (site #2747), Ellwood Central and West (site #2750), Ellwood Main (site #2751), Ellwood East (site #2752), Atascadero Creek (site #2765), Honda Valley (site #2772), Via Real and Padaro (site #2782), Lambert Road (site #2783), Carpinteria Creek (site #2799), Oil and Gas Buffer Zone (site #2800), Padaro Lane 2 (site #3223), and Padaro Lane 3 (site #3224). Ellwood Mesa and the Sperling Preserve, which includes four areas in this subunit (Ellwood/Sandpiper Golf Course, Ellwood Central and West, Ellwood Main, and Ellwood East), is partially owned by the City of Goleta, the Land Trust for Santa Barbara County, and the University of California, and is managed for recreation and conservation. Part of the area at Atascadero Creek is within Goleta Beach County Park, owned by Santa Barbara County. Part of the area at Carpinteria Creek is within Carpinteria State Beach, owned by the State of California and managed by the California Department of Parks and Recreation. Part of the area at the Oil and Gas Buffer Zone is within Tar Pits Park, owned by the City of Goleta.

Subunit 2b consists of 431 ac (174 ha) and is composed of lands in State (42 ac (17 ha)) and private or other ownership (389 ac (158 ha)). It includes the following areas: The Nature Conservancy Preserve (site #2723), Rancho San Augustine (site #2725), Santa Anita Creek (site #2728), Gaviota State Beach (site #2731), Lower Cementario (site #2732), and Canada Alcatraz (north) (site #2733). Gaviota State Park, which includes part of three areas in this subunit (Gaviota State Beach, Lower Cementario, and Canada Alcatraz (north)), is owned by the State of California and managed by the California Department of Parks and Recreation. Part of the area identified as The Nature Conservancy Preserve is within the Jack and Laura Dangermond Preserve, owned by The Nature Conservancy.

Unit 3: San Luis Obispo County

Unit 3 consists of three subunits in San Luis Obispo County, California. The monarch butterfly occupies each of the subunits in this unit, and the subunits contain all of the physical or biological

features essential to the conservation of the species.

Special management considerations or protection may be required within Unit 3 to address coastal development, unsuitable management practices in overwintering habitat, insecticide applications, herbicide applications resulting in loss of nectar sources, and impacts from climate change (*e.g.,* drought, increased storm severity, extreme temperatures). Management activities, such as incompatible tree trimming or removal, nectar plant removal, and tropical milkweed planting, have the potential to impact the suitability of overwintering habitat used by monarchs in Unit 3. Special management focused on maintaining and/or enhancing the monarch overwintering groves, vegetation and/or topography that surround the groves, and habitat features nearby that support overwintering monarchs will benefit the physical or biological features essential to the conservation of the species in this unit.

Subunit 3a consists of 470 ac (190 ha) and is composed of lands in State (86 ac (35 ha)) and private or other ownership (384 ac (155 ha)). It includes the following areas: Pismo Beach (North Beach Campground) (site #3060), Halcyon Hill (site #3067), overwintering site in Oceano (site #3082), Blacklake I (site #3083), Blacklake II (site #3089), Woodlands Village Monarch Habitat (site #3167), and Callendar Road (site #3214). Pismo State Beach (which includes parts of two areas in this subunit: Pismo Beach (North Beach Campground) and the overwintering site in Oceano) and Oceana Dunes State Vehicular Recreation Area (which includes part of Blacklake II and Callendar Road areas) are owned by California Department of Parks and Recreation. The Sand and Surf County Park encompasses a part of the overwintering sites in Oceano and is owned by the County of San Luis Obispo. The Land Conservancy of San Luis Obispo County owns part of three areas in this subunit (Blacklake I and II, and Callendar Road).

Subunit 3b consists of 639 ac (258 ha) and is composed of lands in city (15 ac (6 ha)), county (29 ac (12 ha)), State (321 ac (130 ha)), and private ownership (274 ac (111 ha)). It includes the following areas: Pecho Road (site #3043), Toro Creek (site #3051), Hazard Cove (site #3052), Monarch Lane (site #3053), Morro Bay State Park Campground (site #3055), Morro Bay Golf Course (site #3056), Camp Keep at Montana De Oro State Park (site #3058), Main and Surf Street (site #3076), Del Mar Park (site #3233), San Luis Obispo Creek (site #3245), and Cayucos Creek Road and State Highway 1 (site #3266). California Department of Parks and Recreation manages areas within this subunit, including areas within Montaña de Oro State Park (Hazard Cove, Monarch Lane, and Camp Keep) and Morro Bay State Park (Morro Bay State Park Campground and Morro Bay Golf Course). The County of San Luis Obispo owns the Toro Creek Preserve (which includes the Toro Creek area), the Monarch Grove Natural Area (which includes the Monarch Lane area), and Hardie Park (which includes the Cayucos Creek Road and State Highway 1 area). The City of Morro Bay owns Del Mar Park, which contains part of the Del Mar Park area. Part of the area at San Luis Obispo Creek is within the Dana Abode land, which is owned by the City of San Luis Obispo.

Subunit 3c consists of 403 ac (163 ha) and is composed of lands in State (126 ac (51 ha)), Federal (15 ac (6 ha)), village (117 ac (47 ha)) and private ownership (145 ac (59 ha)). It includes the following areas: Sebastian's Store (site #3045), Fiscalini Ranch (site #3046), Whitaker Flat (site #3071), Hamlet (site #3073), and overwintering site at Ragged Point 3 (site #3258). Hearst San Simeon State Park, which is owned by the California Department of Parks and Recreation, contains portions of both the Whitaker Flat and Hamlet areas. The Fiscalini Ranch area is partially owned by the village of Cambria Community Services District. A portion of the overwintering sites at Ragged Point 3 is in the Los Padres National Forest, which is owned by the U.S. Forest Service.

Unit 4: Monterey County

Unit 4 consists of 204 ac (83 ha) in Monterey County and is composed of lands in city (2 ac (1 ha)), State (52 ac (21 ha)), and private ownership (150 ac (61 ha)). It includes the following areas: overwintering site near Big Sur (site #2920), Andrew Molera State Park (site #2924), Pacific Grove Monarch Butterfly Sanctuary (site #2935), and overwintering site in Monterey (site #3192). A portion of the Andrew Molera State Park is owned and managed by the California Department of Parks and Recreation. Part of the area at the Pacific Grove Monarch Butterfly Sanctuary is in the baseball park, which is owned by the City of Pacific Grove. The monarch butterfly occupies the entire unit, and the unit contains all of the physical or biological features essential to the conservation of the species.

Special management considerations or protection may be required within Unit 4 to address coastal development, unsuitable management practices in overwintering habitat, insecticide applications, herbicide applications resulting in loss of nectar sources, and impacts from climate change (*e.g.,* drought, increased storm severity, extreme temperatures). Management activities, such as incompatible tree trimming or removal, nectar plant removal, and tropical milkweed planting, have the potential to impact the suitability of overwintering habitat used by monarchs in Unit 4. Special management focused on maintaining and/or enhancing the monarch overwintering groves, vegetation and/or topography that surround the groves, and habitat features nearby that support overwintering monarchs will benefit the physical or biological features essential to the conservation of the species in this unit.

Unit 5: Santa Cruz County

Unit 5 consists of 289 ac (117 ha) in Santa Cruz County and is composed of lands in city (3 ac (1 ha)), county (7 ac (3 ha)), State (87 ac (35 ha)), Federal (16 ac (7 ha)), and private ownership (175 ac (71 ha)). It includes the following areas: Moran Lake (site #2983), Natural Bridges State Beach (site #2998), Lighthouse Field (site #3000), and Ocean View and Marine Drive (site #3010). Part of the area of Moran Lake is in Moran Lake Park, which is owned by the County of Santa Cruz. The City of Santa Cruz owns parts of three of these areas in this subunit (Moran Lake, Natural Bridges State Park, and Lighthouse Field). A portion of both the Natural Bridges State Beach and the Lighthouse Field are owned and managed by the California Department of Parks and Recreation. Part of the Ocean View and Marine Drive area is contained in the California Coastal National Monument, which is owned by the United States Bureau of Land Management. The monarch butterfly occupies the entire unit, and the unit contains all of the physical or biological features essential to the conservation of the species.

Special management considerations or protection may be required within Unit 5 to address coastal development, unsuitable management practices in overwintering habitat, insecticide applications, herbicide applications resulting in loss of nectar sources, and impacts from climate change (*e.g.,* drought, increased storm severity, extreme temperatures). Management activities, such as incompatible tree trimming or removal, nectar plant removal, and tropical milkweed planting, have the potential to impact the suitability of overwintering habitat used by monarchs in Unit 5. Special

management focused on maintaining and/or enhancing the monarch overwintering groves, vegetation and/or topography that surround the groves, and habitat features nearby that support overwintering monarchs will benefit the physical or biological features essential to the conservation of the species in this unit.

Unit 6: Alameda County

Unit 6 consists of 261 ac (105 ha) in Alameda County and is composed of lands in city (54 ac (22 ha)) and private ownership (207 ac (84 ha)). It includes the following areas: Ardenwood Historical Farm (site #2831), Chuck Corica Golf Course (site #2832), and San Leandro Golf Course (site #2833). A portion of the Ardenwood Historical Farm is owned by the City of Fremont. A part of the San Leandro Golf Course is within Marina Park, which is owned by the city of San Leandro. The monarch butterfly occupies the entire unit, and the unit contains all of the physical or biological features essential to the conservation of the species.

Special management considerations or protection may be required within Unit 6 to address coastal development, unsuitable management practices in overwintering habitat, insecticide applications, herbicide applications resulting in loss of nectar sources, and impacts from climate change (*e.g.,* drought, increased storm severity, extreme temperatures). Management activities, such as incompatible tree trimming or removal, nectar plant removal, and tropical milkweed planting, have the potential to impact the suitability of overwintering habitat used by monarchs in Unit 6. Special management focused on maintaining and/or enhancing the monarch overwintering groves, vegetation and/or topography that surround the groves, and habitat features nearby that support overwintering monarchs will benefit the species physical or biological features essential to the conservation of the in this unit.

Unit 7: Marin County

Unit 7 consists of 242 ac (98 ha) in Marin County and is composed of lands in county (8 ac (3 ha)), State (1 ac (less than 1 ha)), Federal (43 ac (18 ha)), and private ownership (189 ac (77 ha)). It includes the following areas: Purple Gate (site #2899), Chapman Ravine (site #2903), Alder Road (site #2912), Charlotte near Muir Beach (site #3226), and Juniper Road and Kale Road (site #3227). The United States National Park Service owns and manages the Point Reyes National Seashore (which contains a portion of the Purple Gate and Alder Road areas) and the Golden Gate National Recreation Area (which contains a portion of the Chapman Ravine and Charlotte near Muir Beach areas). A part of the Chapman Ravine area is contained in Stinson Beach, which is owned by the California Department of Fish and Wildlife. Portions of the Chapman Ravine area are also contained in the Upton County Beach and Village Green, both of which are owned by the Marin County Parks Department. The Marin County Parks Department also owns Agate Beach, which contains a portion of the Alder Road area. The monarch butterfly occupies the entire unit, and the unit contains all of the physical or biological features essential to the conservation of the species.

Special management considerations or protection may be required within Unit 7 to address coastal development, unsuitable management practices in overwintering habitat, insecticide applications, herbicide applications resulting in loss of nectar sources, and impacts from climate change (*e.g.,* drought, increased storm severity, extreme temperatures). Management activities, such as incompatible tree trimming or removal, nectar plant removal, and tropical milkweed planting, have the potential to impact the suitability of overwintering habitat used by monarchs in Unit 7. Special management focused on maintaining and/or enhancing the monarch overwintering groves, vegetation and/or topography that surround the groves, and habitat features nearby that support overwintering monarchs will benefit the physical or biological features essential to the conservation of the species in this unit.

Effects of Critical Habitat Designation

Section 7 Consultation

Section 7(a)(2) of the Act requires Federal agencies, including the Service, to ensure that any action they authorize, fund, or carry out is not likely to jeopardize the continued existence of any endangered species or threatened species or result in the destruction or adverse modification of designated critical habitat of such species. In addition, section 7(a)(4) of the Act requires Federal agencies to confer with the Service on any agency action which is likely to jeopardize the continued existence of any species proposed to be listed under the Act or result in the destruction or adverse modification of proposed critical habitat.

Destruction or adverse modification means a direct or indirect alteration that appreciably diminishes the value of critical habitat as a whole for the conservation of a listed species (50 CFR 402.02).

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

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

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

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

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

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

(3) Are economically and technologically feasible, and

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

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

Regulations at 50 CFR 402.16 set forth requirements for Federal agencies to reinitiate consultation. Reinitiation of consultation is required and shall be requested by the Federal agency, where discretionary Federal involvement or control over the action has been retained or is authorized by law and: (1) If the amount or extent of taking specified in the incidental take statement is exceeded; (2) if new information reveals effects of the action that may affect listed species or critical habitat in a manner or to an extent not previously considered; (3) if the identified action is subsequently modified in a manner that causes an effect to the listed species or critical habitat that was not considered in the biological opinion or written

concurrence; or (4) if a new species is listed or critical habitat designated that may be affected by the identified action. As provided in 50 CFR 402.16, the requirement to reinitiate consultations for new species listings or critical habitat designation does not apply to certain agency actions (*e.g.,* land management plans issued by the Bureau of Land Management in certain circumstances).

Destruction or Adverse Modification of Critical Habitat

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

Section 4(b)(8) of the Act requires that our **Federal Register** documents ''shall, to the maximum extent practicable also include a brief description and evaluation of those activities (whether public or private) which, in the opinion of the Secretary, if undertaken may adversely modify [critical] habitat, or may be affected by such designation.'' Activities that may be affected by designation of critical habitat for the monarch butterfly include those that may affect the physical or biological features of the monarch butterfly's critical habitat (see **Physical or Biological Features Essential to the Conservation of the Species**).

Exemptions

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

The Sikes Act Improvement Act of 1997 (Sikes Act) (16 U.S.C. 670a) required each military installation that includes land and water suitable for the conservation and management of natural resources to complete an integrated natural resources management plan (INRMP) by November 17, 2001. An INRMP integrates implementation of the military mission of the installation with stewardship of the natural resources found on the base. Each INRMP includes:

(1) An assessment of the ecological needs on the installation, including the need to provide for the conservation of listed species;

(2) A statement of goals and priorities;

(3) A detailed description of management actions to be implemented to provide for these ecological needs; and

(4) A monitoring and adaptive management plan.

Among other things, each INRMP must, to the extent appropriate and applicable, provide for fish and wildlife management; fish and wildlife habitat enhancement or modification; wetland protection, enhancement, and restoration where necessary to support fish and wildlife; and enforcement of applicable natural resource laws.

The National Defense Authorization Act for Fiscal Year 2004 (Pub. L. 108–136) amended the Act to limit areas eligible for designation as critical habitat. Specifically, section 4(a)(3)(B)(i) of the Act provides that the Secretary shall not designate as critical habitat any lands or other geographical areas owned or controlled by the DoD, or designated for its use, that are subject to an INRMP prepared under section 101 of the Sikes Act, if the Secretary determines in writing that such plan provides a benefit to the species for which critical habitat is proposed for designation.

We consult with the military on the development and implementation of INRMPs for installations with listed species. We analyzed INRMPs developed by military installations located within the range of the proposed critical habitat designation for the monarch butterfly to determine if they meet the criteria for exemption from critical habitat under section 4(a)(3) of the Act. The following areas are DoD lands with completed, Service-approved INRMPs within the proposed critical habitat designation.

Approved INRMPs

Vandenberg Space Force Base, Santa Barbara County, California

Vandenberg Space Force Base (VSFB) occupies approximately 99,579 ac (40,298 ha) and extends along 42 mi (68 km) of the California coast in Santa Barbara County and varies from 5 mi (8 km) to 15 mi (24 km) in width. Monarch breeding and nectaring habitat is widely distributed throughout VSFB, and there are currently 34 known overwintering sites. Overwintering groves on the facility range in size from 0.13 to 556 ac (0.05 to 25 ha), and the dominant tree species include blue gum eucalyptus, Monterey pine, Monterey cypress, and coast live oak. We have identified 439 ac (178 ha) of overwintering habitat on the facility that meets the definition of critical habitat for the monarch butterfly.

The INRMP for VSFB was recently updated in coordination with the Service (VSFB 2024, entire). The INRMP includes measures for management of threatened and endangered species and their habitats through a specific management plan called the Threatened and Endangered Species Management Plan (Management Plan). The Management Plan addresses all special-status plant and wildlife species (*i.e.,* species that are federally listed species or legally protected be other regulations) that are known or have potential to occur at VSFB, including monarch butterflies, and provides resource managers a framework for implementing an effective, long-term management program for protection and conservation of special-status plants and animals and their habitats. The primary objective of the natural resources program on VSFB is to ensure continued access to land and airspace required to accomplish the facility's mission by maintaining these resources in a healthy condition. Natural resources management, in particular threatened and endangered species management, has been identified by the facility as a critical mission component because biodiversity conservation contributes to overall ecosystem integrity and sustainability, which in turn supports the facility's mission by maintaining natural landscapes for realistic military testing, training, and operations.

The Management Plan provides a conservation benefit for the monarch butterfly and its breeding and overwintering habitats that occur on VSFB and outlines a clear, measurable path to implementation of the actions being taken to conserve the species and its habitats (VSFB 2024, addendum to Tab D).

Key threats identified in the INRMP to the monarch butterfly include habitat degradation, loss, or lack of active management to maintain grove conditions; harassment and disturbance; pest management; and woodcutting practices. Management actions identified and implemented through the INRMP for these threats include (1) conserving, managing, enhancing, and restoring monarch butterfly overwintering sites and surrounding habitat; (2) using only native, insecticide-free plants for habitat restoration and enhancement actions; (3) conducting overwintering site habitat assessments and developing and implementing long-term management plans; (4) avoiding the use of pesticides within 152 m (500 ft) of overwintering sites, particularly when monarchs may be present; (5) not planting any type of milkweed at or adjacent to overwintering sites (to assist in maintaining normal migration

behavior); (6) monitoring monarchs and assessing conditions of overwintering sites during the Western Monarch Count, and monitoring monarch populations before and after launches that occur during the overwintering time period; (7) conserving known areas with milkweed stands from disturbance, including pesticides; (8) planting insecticide- and fungicide-free native milkweed and nectar plants in migratory and breeding areas; (9) conducting management actions within monarch breeding and migratory habitat outside of the time when monarchs are likely to be present; and (10) implementing grazing best management practices to avoid negative impacts on breeding monarchs.

Based on the above considerations, and in accordance with section 4(a)(3)(B)(i) of the Act, we have determined that the identified lands are subject to the VSFB INRMP and that conservation efforts identified in the INRMP will provide a benefit to the monarch butterfly. Therefore, lands within this installation are exempt from critical habitat designation under section 4(a)(3) of the Act. We are not including approximately 439 ac (178 ha) of habitat in this proposed critical habitat designation because of this exemption.

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

Section 4(b)(2) of the Act states that the Secretary shall designate and make revisions to critical habitat on the basis of the best available scientific data after taking into consideration the economic impact, the impact on national security, and any other relevant impact of specifying any particular area as critical habitat. The Secretary may exclude any area from critical habitat if the benefits of exclusion outweigh those of inclusion, so long as exclusion will not result in extinction of the species concerned. Exclusion decisions are governed by the regulations at 50 CFR 424.19 and the Policy Regarding Implementation of Section 4(b)(2) of the Endangered Species Act (hereafter, the ''2016 Policy''; 81 FR 7226, February 11, 2016), both of which were developed jointly with the National Marine Fisheries Service (NMFS). We also refer to a 2008 Department of the Interior Solicitor's opinion entitled ''The Secretary's Authority to Exclude Areas from a Critical Habitat Designation under Section 4(b)(2) of the Endangered Species Act'' (M–37016).

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

Consideration of Economic Impacts

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

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

Executive Order (E.O.) 14094 amends and reaffirms E.O. 12866 and E.O. 13563 and directs Federal agencies to assess the costs and benefits of available regulatory alternatives in quantitative (to the extent feasible) and qualitative terms. Consistent with the E.O. regulatory analysis requirements, our effects analysis under the Act may take into consideration impacts to both directly and indirectly affected entities, where practicable and reasonable. If sufficient data are available, we assess to the extent practicable the probable impacts to both directly and indirectly affected entities. Section 3(f) of E.O. 12866 identifies four criteria when a regulation is considered a ''significant regulatory action'' and requires additional analysis, review, and approval if met. The criterion relevant here is whether the designation of critical habitat may have an economic effect of $200 million or more in any given year (section 3(f)(1) of E.O. 12866 as amended by E.O. 14094). Therefore, our consideration of economic impacts uses a screening analysis to assess whether a designation of critical habitat for the monarch butterfly is likely to exceed the threshold for a regulatory action significant under section 3(f)(1) of E.O. 12866, as amended by E.O. 14094.

For this particular designation, we developed an incremental effects memorandum (IEM) considering the probable incremental economic impacts that may result from this proposed designation of critical habitat. The information contained in our IEM was then used to develop a screening analysis of the probable effects of the designation of critical habitat for the monarch butterfly (IEc 2024, entire). We began by conducting a screening analysis of the proposed designation of critical habitat in order to focus our analysis on the key factors that are likely to result in incremental economic impacts. The purpose of the screening analysis is to filter out particular geographical areas of critical habitat that are already subject to such protections and are, therefore, unlikely to incur incremental economic impacts. In

particular, the screening analysis considers baseline costs (*i.e.,* absent critical habitat designation) and includes any probable incremental economic impacts where land and water use may already be subject to conservation plans, land management plans, best management practices, or regulations that protect the habitat area as a result of the Federal listing status of the species. Ultimately, the screening analysis allows us to focus our analysis on evaluating the specific areas or sectors that may incur probable incremental economic impacts as a result of the designation.

The presence of the listed species in occupied areas of critical habitat means that any destruction or adverse modification of those areas is also likely to jeopardize the continued existence of the species. Therefore, designating occupied areas as critical habitat typically causes little if any incremental impacts above and beyond the impacts of listing the species. As a result, we generally focus the screening analysis on areas of unoccupied critical habitat (unoccupied units or unoccupied areas within occupied units). Overall, the screening analysis assesses whether designation of critical habitat is likely to result in any additional management or conservation efforts that may incur incremental economic impacts. This screening analysis combined with the information contained in our IEM constitute what we consider to be our economic analysis of the proposed critical habitat designation for the monarch butterfly; our economic analysis is summarized in the narrative below.

As part of our screening analysis, we considered the types of economic activities that are likely to occur within the areas likely affected by the critical habitat designation. In our evaluation of the probable incremental economic impacts that may result from the proposed designation of critical habitat for the monarch butterfly, first we identified, in the IEM dated June 7, 2024, probable incremental economic impacts associated with the following categories of activities: (1) Federal lands management including coastal development, road and bridge maintenance, and railroad maintenance projects (Army Corps of Engineers, Bureau of Land Management, Department of Defense, Federal Highway Administration, Federal Rail Administration, National Park Service, U.S. Forest Service); (2) management practices in overwintering habitat; (3) recreation activities; (4) insecticide applications; (5) herbicide applications; (6) habitat restoration activities; (7) pipeline and utility crossing maintenance and/or installation (Army Corps of Engineers, Federal Energy Regulatory Commission); and (8) maintenance of interstate pipeline rights of way and electrical transmission lines (Federal Energy Regulatory Commission) (Service 2024c, pp. 8–9).

We considered each industry or category individually. Additionally, we considered whether their activities have any Federal involvement. Critical habitat designation generally will not affect activities that do not have any Federal involvement; under the Act, designation of critical habitat affects only activities conducted, funded, permitted, or authorized by Federal agencies. If we list the species, in areas where the monarch butterfly is present, Federal agencies would be required to consult with the Service under section 7 of the Act on activities they authorize, fund, or carry out that may affect the species. If, when we list the species, we also finalize this proposed critical habitat designation, Federal agencies would be required to consider the effects of their actions on the designated habitat, and if the Federal action may affect critical habitat, our consultations would include an evaluation of measures to avoid the destruction or adverse modification of critical habitat.

In our IEM, we attempted to clarify the distinction between the effects that would result from the species being listed and those attributable to the critical habitat designation (*i.e.,* difference between the jeopardy and adverse modification standards) for the monarch butterfly's critical habitat (Service 2024c, entire). Because the designation of critical habitat for monarch butterfly is being proposed concurrently with the listing, it has been our experience that it is more difficult to discern which conservation efforts are attributable to the species being listed and those which will result solely from the designation of critical habitat. However, the following specific circumstances in this case help to inform our evaluation: (1) The essential physical or biological features identified for critical habitat are the same features essential for the life requisites of the species, and (2) any actions that would likely adversely affect the essential physical or biological features of occupied critical habitat are also likely to adversely affect the species itself. The IEM outlines our rationale concerning this limited distinction between baseline conservation efforts and incremental impacts of the designation of critical habitat for this species. This evaluation of the incremental effects has been used as the basis to evaluate the probable incremental economic impacts of this proposed designation of critical habitat.

The proposed critical habitat designation for the monarch butterfly totals 4,395 ac (1,778 ha) in seven units, all of which are occupied by the species during their migratory season of fall and winter. In these areas, any actions that may affect the species' habitat would also affect designated critical habitat. We anticipate consultations for projects where the species is temporarily absent (*e.g.,* during the summer months) but critical habitat is present to allow for movement of the species to be largely informal and resulting in mostly administrative costs and minor project adjustments to minimize impacts. For those formal consultations that may occur, they would most likely be of a magnitude that would involve both the species and critical habitat, and any reasonable and prudent alternatives to avoid jeopardy and/or adverse modification would be the same. Based on historical economic activity levels within the seven counties overlapping proposed critical habitat for the monarch butterfly, staff may be required to complete 27 formal consultations and 17 informal consultations per year on average. The cost of addressing critical habitat as part of these consultations may range from $42,000 to $290,000 per year, depending on how many consultations are triggered by critical habitat alone. While this additional analysis will require time and resources by both the Federal action agency and the Service, it is believed that, in most circumstances, these costs would predominantly be administrative in nature and would not exceed $200 million in any single year; therefore, they would not be significant.

The entities most likely to incur incremental costs are parties to section 7 consultations, including Federal action agencies and, in some cases, third parties, most frequently State agencies or municipalities. Activities we expect would be subject to consultations that may involve private entities as third parties are coastal development that may occur on private lands. However, based on coordination efforts with State and local agencies, the cost to private entities within these sectors is expected to be relatively minor (administrative costs of less than $3,500 per consultation effort); therefore, they would not be significant (*i.e.,* exceed $200 million in a single year).

In conclusion, the probable incremental economic impacts of the monarch butterfly critical habitat designation are expected to be limited to additional administrative effort as well

as minor costs of conservation efforts resulting from future section 7 consultations. Because all of the proposed critical habitat units are considered to be occupied by the species, and incremental economic impacts of critical habitat designation, other than administrative costs, are expected to be limited, few actions are anticipated to result in section 7 consultation for critical habitat only and associated project modifications. Thus, the annual administrative burden is unlikely to reach $200 million, which is the threshold for a significant regulatory action under E.O. 12866.

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

Consideration of National Security Impacts

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

However, we cannot automatically exclude requested areas. When DoD, DHS, or another Federal agency requests exclusion from critical habitat on the basis of national-security or homeland-security impacts, we must conduct an exclusion analysis if the Federal requester provides information, including a reasonably specific justification of an incremental impact on national security that would result from the designation of that specific area as critical habitat. That justification could include demonstration of probable impacts, such as impacts to ongoing border-security patrols and surveillance activities, or a delay in training or facility construction, as a result of compliance with section 7(a)(2) of the Act. If the agency requesting the exclusion does not provide us with a reasonably specific justification, we will contact the agency to recommend that it provide a specific justification or clarification of its concerns relative to the probable incremental impact that could result from the designation. If we conduct an exclusion analysis because the agency provides a reasonably specific justification or because we decide to exercise the discretion to conduct an exclusion analysis, we will defer to the expert judgment of DoD, DHS, or another Federal agency as to: (1) Whether activities on its lands or waters, or its activities on other lands or waters, have national-security or homeland-security implications; (2) the importance of those implications; and (3) the degree to which the cited implications would be adversely affected in the absence of an exclusion. In that circumstance, in conducting a discretionary section 4(b)(2) exclusion analysis, we will give great weight to national-security and homeland-security concerns in analyzing the benefits of exclusion.

Under section 4(b)(2) of the Act, we also consider whether a national security or homeland security impact might exist on lands owned or managed by DoD or DHS. In preparing this proposal, we have determined that, other than the land exempted under section 4(a)(3)(B)(i) of the Act based upon the existence of an approved INRMP (see Exemptions, above), the lands within the proposed designation of critical habitat for the monarch butterfly are not owned or managed by DoD or DHS. Therefore, we anticipate no impact on national security or homeland security.

Consideration of Other Relevant Impacts

Under section 4(b)(2) of the Act, we consider any other relevant impacts, in addition to economic impacts and impacts on national security discussed above. To identify other relevant impacts that may affect the exclusion analysis, we consider a number of factors, including whether there are approved and permitted conservation agreements or plans covering the species in the area—such as safe harbor agreements (SHAs), CCAAs, ''conservation benefit agreements'' or ''conservation agreements'' (CBAs) (CBAs are a new type of agreement replacing SHAs and CCAAs in use after April 2024 (89 FR 26070; April 12, 2024)), or HCPs—or whether there are non-permitted conservation agreements and partnerships that would be encouraged by designation of, or exclusion from, critical habitat. In addition, we look at whether Tribal conservation plans or partnerships, Tribal resources, or government-to-government relationships of the United States with Tribal entities may be affected by the designation. We also consider any State, local, social, or other impacts that might occur because of the designation.

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

In preparing this proposal, we have determined that no HCPs or other management plans for the monarch butterfly currently exist that cover lands included in the proposed critical habitat designation, and the proposed designation does not include any Tribal lands or trust resources or any lands for which designation would have any economic or national security impacts. Therefore, we anticipate no impact on Tribal lands, partnerships, or HCPs from this proposed critical habitat designation and thus, as described above, we are not considering excluding any particular areas on the basis of the presence of conservation agreements or impacts to trust resources.

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

Required Determinations

Clarity of the Rule

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

(1) Be logically organized;

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

(3) Use clear language rather than jargon;

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

(5) Use lists and tables wherever possible.

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

Regulatory Planning and Review (Executive Orders 12866, 13563 and 14094)

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

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.

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

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

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

Energy Supply, Distribution, or Use—Executive Order 13211

Executive Order 13211 (Actions Concerning Regulations That Significantly Affect Energy Supply, Distribution, or Use) requires agencies to prepare statements of energy effects ''to the extent permitted by law'' when undertaking actions identified as significant energy actions (66 FR 28355; May 22, 2001). E.O. 13211 defines a ''significant energy action'' as an action that (i) meets the definition of a ''significant regulatory action'' under E.O. 12866, as amended by E.O. 14094; and (ii) is likely to have a significant adverse effect on the supply, distribution, or use of energy. In our economic analysis, we did not find that this proposed critical habitat designation would significantly affect energy supplies, distribution, or use. Therefore, this action is not a significant energy action, and no statement of energy effects is required.

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

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

(1) This proposed rule would not produce a Federal mandate. In general, a Federal mandate is a provision in legislation, statute, or regulation that would impose an enforceable duty upon State, local, or Tribal governments, or the private sector, and includes both ''Federal intergovernmental mandates'' and ''Federal private sector mandates.'' These terms are defined in 2 U.S.C. 658(5)–(7). ''Federal intergovernmental

mandate'' includes a regulation that ''would impose an enforceable duty upon State, local, or Tribal governments'' with two exceptions. It excludes ''a condition of Federal assistance.'' It also excludes ''a duty arising from participation in a voluntary Federal program,'' unless the regulation ''relates to a then-existing Federal program under which $500,000,000 or more is provided annually to State, local, and Tribal governments under entitlement authority,'' if the provision would ''increase the stringency of conditions of assistance'' or ''place caps upon, or otherwise decrease, the Federal Government's responsibility to provide funding,'' and the State, local, or Tribal governments ''lack authority'' to adjust accordingly. At the time of enactment, these entitlement programs were: Medicaid; Aid to Families with Dependent Children work programs; Child Nutrition; Food Stamps; Social Services Block Grants; Vocational Rehabilitation State Grants; Foster Care, Adoption Assistance, and Independent Living; Family Support Welfare Services; and Child Support Enforcement. ''Federal private sector mandate'' includes a regulation that ''would impose an enforceable duty upon the private sector, except (i) a condition of Federal assistance or (ii) a duty arising from participation in a voluntary Federal program.''

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

(2) We do not believe that this rulemaking would significantly or uniquely affect small governments because it is not anticipated to produce a Federal mandate of $100 million or more (adjusted annually for inflation) in any given year; that is, it is not a ''significant regulatory action'' under the Unfunded Mandates Reform Act. The designation of critical habitat imposes no obligations on State or local governments. By definition, Federal agencies are not considered small entities, although the activities they fund or permit may be proposed or carried out by small entities. Consequently, we do not believe that the proposed critical habitat designation would significantly or uniquely affect small government entities. Therefore, a small government agency plan is not required.

Takings—Executive Order 12630

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

Federalism—Executive Order 13132

In accordance with E.O. 13132 (Federalism), this proposed rule does not have significant federalism effects. A federalism summary impact statement is not required. In keeping with Department of the Interior and Department of Commerce policy, we requested information from, and coordinated development of this proposed critical habitat designation with, appropriate State resource agencies. From a federalism perspective, the designation of critical habitat directly affects only the responsibilities of Federal agencies. The Act imposes no other duties with respect to critical habitat, either for States and local governments, or for anyone else. As a result, the proposed rule does not have substantial direct effects on the States, or on the relationship between the Federal Government and the States, or on the distribution of powers and responsibilities among the various levels of government. The proposed designation may have some benefit to these governments because the areas that contain the features essential to the conservation of the species are more clearly defined, and the physical or biological features of the habitat necessary for the conservation of the species are specifically identified. This information does not alter where and what federally sponsored activities may occur. However, it may assist State and local governments in long-range planning because they no longer have to wait for case-by-case section 7 consultations to occur.

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

Civil Justice Reform—Executive Order 12988

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

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

This rulemaking does not contain information collection requirements,

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

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

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

Government-to-Government Relationship With Tribes

In accordance with the President's memorandum of April 29, 1994 (Government-to-Government Relations with Native American Tribal Governments; 59 FR 22951, May 4, 1994), 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 (ANCs) 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 have determined that no Tribal lands fall within the boundaries of the proposed critical habitat for the monarch butterfly, so no Tribal lands would be affected by the proposed designation.

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 Midwest Region Headquarters (see **FOR FURTHER INFORMATION CONTACT**).

Authors

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

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, amend paragraph (h) by adding an entry for ''Butterfly, monarch'' to the List of Endangered and Threatened Wildlife in alphabetical order under INSECTS to read as follows:

§ 17.11 Endangered and threatened wildlife.

* * * * *

(h) * * *

Common name	Scientific name	Where listed	Status	Listing citations and applicable rules
* *	*	*	*	* *
INSECTS				
* *	*	*	*	* *
Butterfly, monarch	*Danaus plexippus*	Wherever found	T	**Federal Register** citation when published as a final rule]; 50 CFR 17.47(k); [4d] 50 CFR 17.95(i).[CH]
* *	*	*	*	* *

■ 3. Further amend § 17.47, as proposed to be amended at 89 FR 63888 (August 6, 2024) and 89 FR 79857 (October 10, 2024), by adding paragraph (k) to read as follows:

§ 17.47 Species-specific rules—insects.

* * * * *

(k) Monarch butterfly (*Danaus plexippus*)—(1) *Prohibitions.* The following prohibitions that apply to endangered wildlife also apply to the monarch butterfly in the contiguous United States, Puerto Rico, and the U.S. Virgin Islands. Except as provided under paragraph (k)(2) of this section and §§ 17.4 and 17.5, it is unlawful for any person subject to the jurisdiction of the United States to commit, to attempt to commit, to solicit another to commit, or cause to be committed, any of the following acts in regard to 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 (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) Take incidental to an otherwise lawful activity caused by:

(A) Activities that may maintain, enhance, remove, or establish milkweed and nectar plants within the breeding and migratory range that do not result in conversion of native or naturalized grassland, shrubland, or forested habitats, which for the purposes of this paragraph (k) includes the contiguous United States (except overwintering sites), Puerto Rico, and the U.S. Virgin Islands. These activities include the following:

(*1*) Habitat restoration and management activities, such as mowing and haying native rangeland, that sustain grassland, shrubland, or forested land with monarch butterfly habitat.

(*2*) Livestock grazing and routine ranching activities, including rotational grazing, patch-burn grazing, vegetation and invasive species management, other grazing practices implemented to make pasture and rangelands productive, construction and maintenance of fences, the gathering and management of livestock, and the development and maintenance of watering facilities for livestock.

(*3*) Routine agricultural activities, including plowing, drilling, disking, mowing, and other mechanical manipulation and management of lands already in use for agricultural production (*e.g.,* conventional row crops, pasture, hay fields, orchards, and vineyards). This exception also includes activities in direct support of cultivated agriculture, such as replacement, upgrades, maintenance, and operation of existing infrastructure (*e.g.,* buildings, irrigation conveyance structures, fences, and roads), and routine implementation and maintenance of agricultural conservation practices (*e.g.,* terraces, dikes, grassed waterways, and conservation tillage).

(*4*) Fire management actions (*e.g.,* prescribed burns, cultural burns, hazardous fuel reduction activities, vegetation management, maintenance of fuel breaks and minimum clearance requirements, and other fuels reduction activities).

(*5*) Silviculture practices and forest management activities that use State-approved best management practices.

(*6*) Maintenance, enhancement, removal, and establishment of milkweed and nectar plants on residential and other developed properties.

(*7*) Vegetation management activities, such as mowing, ground disturbance, and other management activities, that remove milkweed and/or nectar plants when conducted at times of year when monarchs are not likely present.

(B) Activities intended to conserve the species conducted by participants in a comprehensive conservation plan for the monarch butterfly developed by or in coordination with a State agency or agencies, or their agent(s), or implementation of a conservation program for the monarch butterfly developed by a Federal agency in fulfillment of their responsibilities under section 7(a)(1) of the Act.

(C) Maintenance or improvement of monarch overwintering habitat in the United States consistent with a site-specific Service-approved overwintering site land management plan for the conservation of monarchs at the site. Overwintering habitat is defined as habitat that provides overwintering monarch butterflies with the abiotic and biotic conditions necessary for clustering, aggregating, and feeding (nectaring).

(D) Vehicle strikes.

(vi) Take caused by:

(A) Nonlethal collection, possession, or captive-rearing of 250 or fewer monarchs per year at any one location or facility (such as a home, botanical garden, school, or business). Collection is defined as nonlethal capture and holding of live monarchs at any life stage. Captive-rearing is defined as the holding of caterpillars, pupae (chrysalises), or adults and raising them in captivity long enough for them to move to the next life stage or to reproduce. This exception does not apply to wild clustering monarchs.

(B) Release of 250 or fewer captively reared or held monarch adults per year by any one location or facility (such as a home, botanical garden, school, or business).

(C) Nonlethal scientific research and educational activities involving 250 or fewer monarchs per year at any one location or facility (such as a home, botanical garden, school, business, or research facility). Activities associated with scientific research and education may include collection for purposes of handling, netting, sampling for disease, tagging of monarchs, and life cycle and specimen observations of monarchs. This exception does not apply to wild clustering monarchs.

(vii) Possess dead monarchs.

(viii) Sell or offer for sale 250 or fewer captively reared monarchs per year from any one location or facility (such as a home, botanical garden, school, business).

■ 4. Amend § 17.95 in paragraph (i) by adding an entry for ''Monarch Butterfly (*Danaus plexippus*)'' after the entry for ''Island Marble Butterfly (*Euchloe ausonides insulanus*)'' to read as follows:

§ 17.95 Critical habitat—fish and wildlife.

* * * * *

(i) *Insects.*

* * * * *

Monarch Butterfly (*Danaus plexippus*)

(1) Critical habitat units are depicted for Alameda, Marin, Monterey, San Luis Obispo, Santa Barbara, Santa Cruz, and Ventura Counties, California, on the maps in this entry.

(2) Within these areas, the physical or biological features essential to the conservation of monarch butterfly consist of the following components:

(i) Groves of trees (*e.g.,* blue gum eucalyptus, Monterey pine, Monterey cypress, Coast redwood, coast live oak, Douglas fir, Torrey pine, western sycamore, bishop pine) that serve as sites for overwintering monarchs to cluster along the coast of California.

(ii) Trees, herbaceous or shrubby vegetation, and/or topography surrounding overwintering groves that contribute to the following microclimate conditions:

(A) Indirect or dappled sunlight;

(B) Water sources (*e.g.,* stream, pond, or moist soil) for hydration;

(C) Defense against freezing temperatures; and

(D) Protection from strong winds.

(iii) Supportive features nearby (*i.e.,* within 152 meters (500 feet) of) overwintering groves, including the following:

(A) Flowering plants for nectar;

(B) Water sources (*e.g.,* stream, pond, or moist soil) for hydration; and

(C) Protective landscape features (*e.g.,* topography or vegetation) that lessen the impacts of prevailing winds on groves of trees.

(3) Critical habitat does not include manmade structures (such as buildings, aqueducts, runways, roads, and other paved areas) and the land on which they are located existing within the legal boundaries on [EFFECTIVE DATE OF THE FINAL RULE].

(4) Data layers defining map units were created using mapping data collected as part of the annual Western Monarch Count (see Xerces Society 2024b, unpaginated). Critical habitat units were then mapped using ''NAD 1983 California (Teale) Albers (Meters).'' The site names and numbers on the maps in this entry match those used for the Western Monarch Count annual survey. The maps in this entry, as supplemented by text in this entry, establish the boundaries of the critical habitat designation. The coordinates or plot points or both on which each map

is based are available to the public at *https://www.regulations.gov* at Docket No. FWS–R3–ES–2024–0137, and at the regional office responsible for this designation. You may obtain regional office location information by contacting one of the Service regional offices, the addresses of which are listed at 50 CFR 2.2.

(5) Index map follows:

Figure 1 to Monarch Butterfly (*Danaus plexippus*) paragraph (5)

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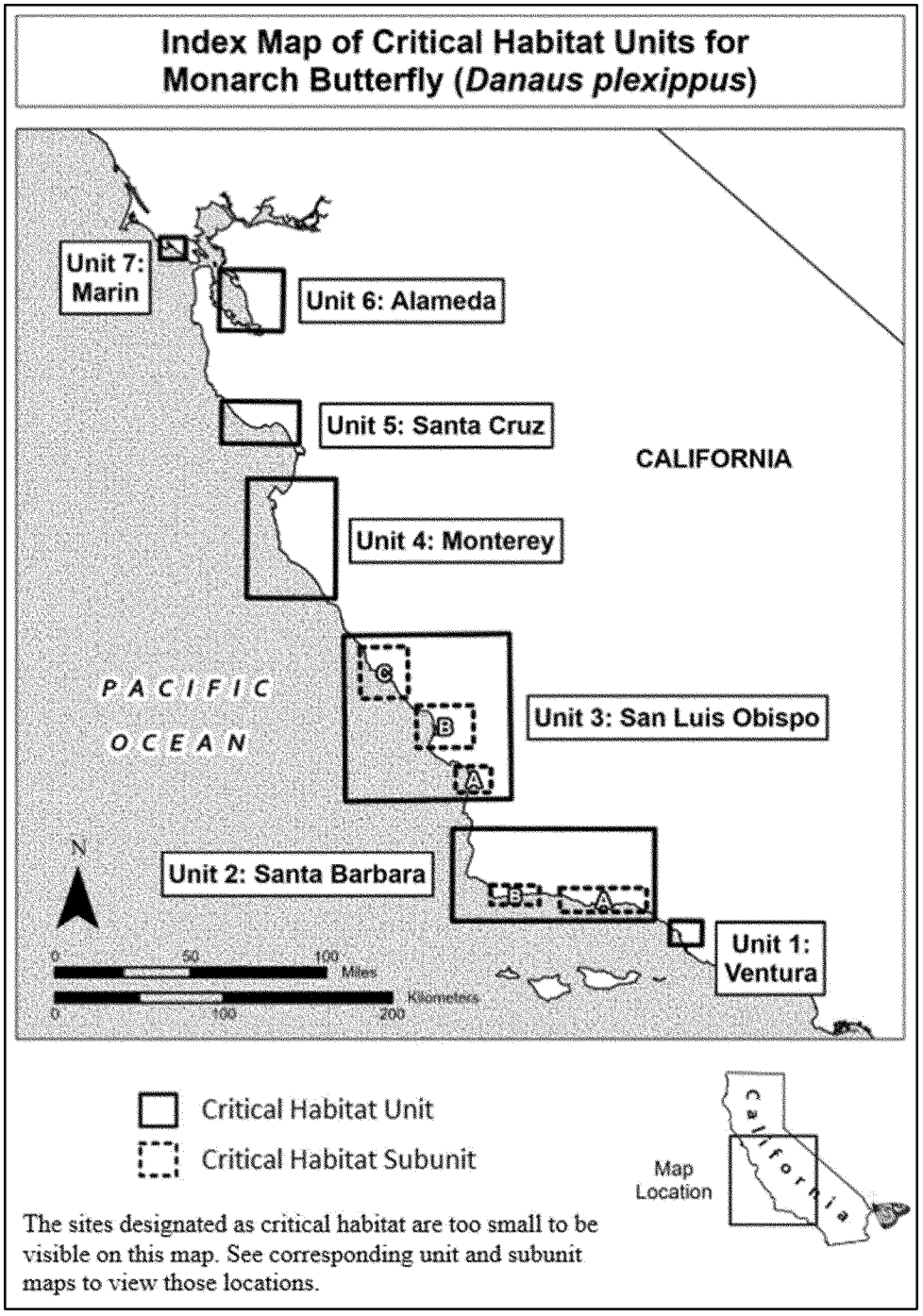
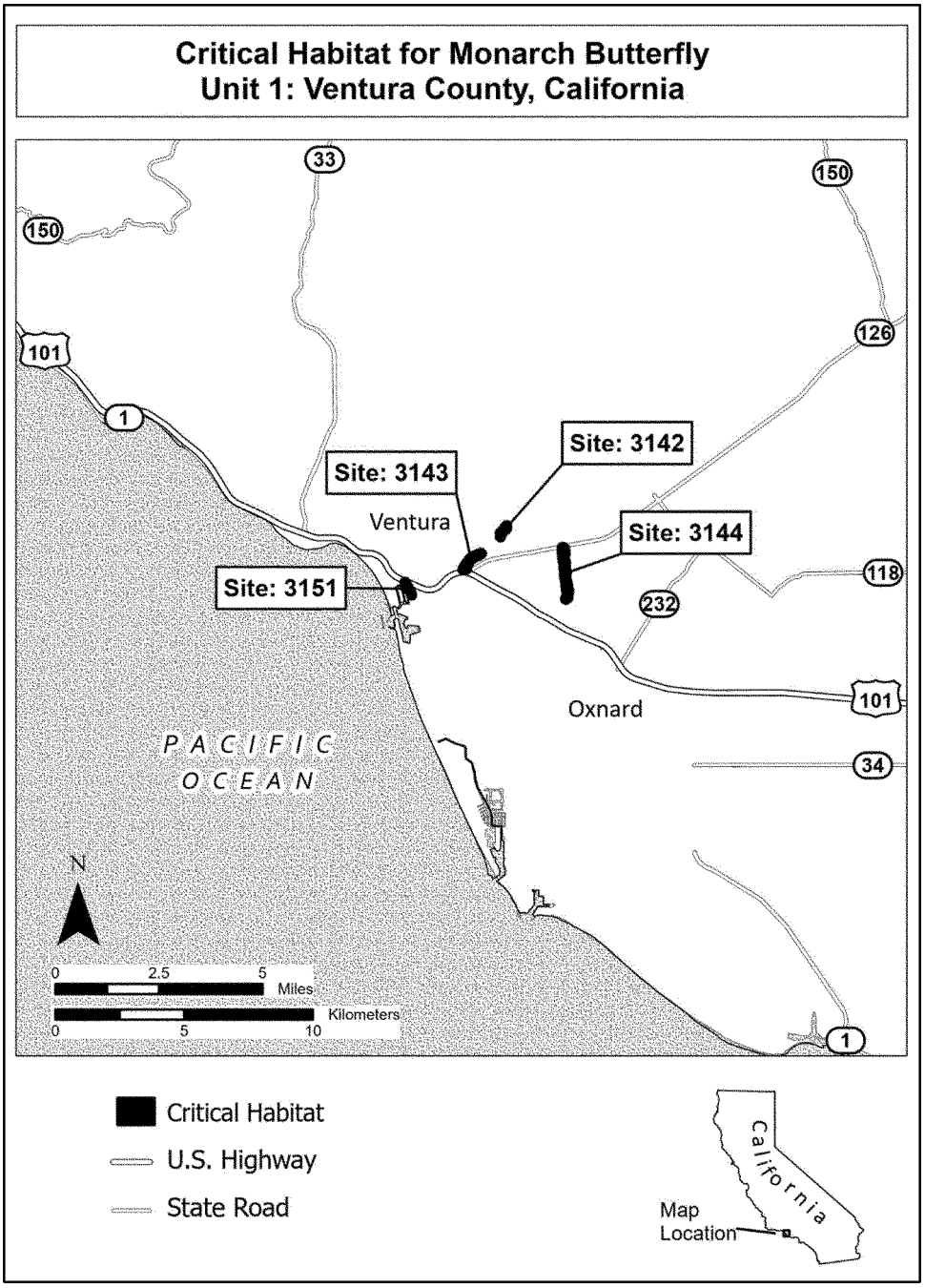


(6) Unit 1: Ventura County.

(i) Unit 1 consists of 493 ac (199 ha) in Ventura County, California. It includes four areas: Arrundel Barranca (site #3142), Camino Real Park (site #3143), Harmon Barranca (site #3144), and Harbor Boulevard (site #3151).

(ii) Map of Unit 1 follows:

Figure 2 to Monarch Butterfly (*Danaus plexippus*) paragraph (6)(ii)



(7) Unit 2: Santa Barbara County.

(i) Unit 2 consists of the following two subunits in Santa Barbara County, California:

(A) Subunit 2a consists of 964 ac (390 ha). It includes the following areas: Las Varas Ranch (site #2741), Ellwood/Sandpiper Golf Course (site #2747), Ellwood Central and West (site #2750), Ellwood Main (site #2751), Ellwood East (site #2752), Atascadero Creek (site #2765), Honda Valley (site #2772), Via Real and Padaro (site #2782), Lambert Road (site #2783), Carpinteria Creek (site #2799), Oil and Gas Buffer Zone (site #2800), Padaro Lane 2 (site #3223), and Padaro Lane 3 (site #3224).

(B) Subunit 2b consists of 431 ac (174 ha). It includes the following areas: The Nature Conservancy Preserve (site #2723), Rancho San Augustine (site #2725), Santa Anita Creek (site #2728), Gaviota State Beach (site #2731), Lower Cementario (site #2732), and Canada Alcatraz (north) (site #2733).

(ii) Maps of Unit 2 follow:

Figure 3 to Monarch Butterfly (*Danaus plexippus*) paragraph (7)(ii)

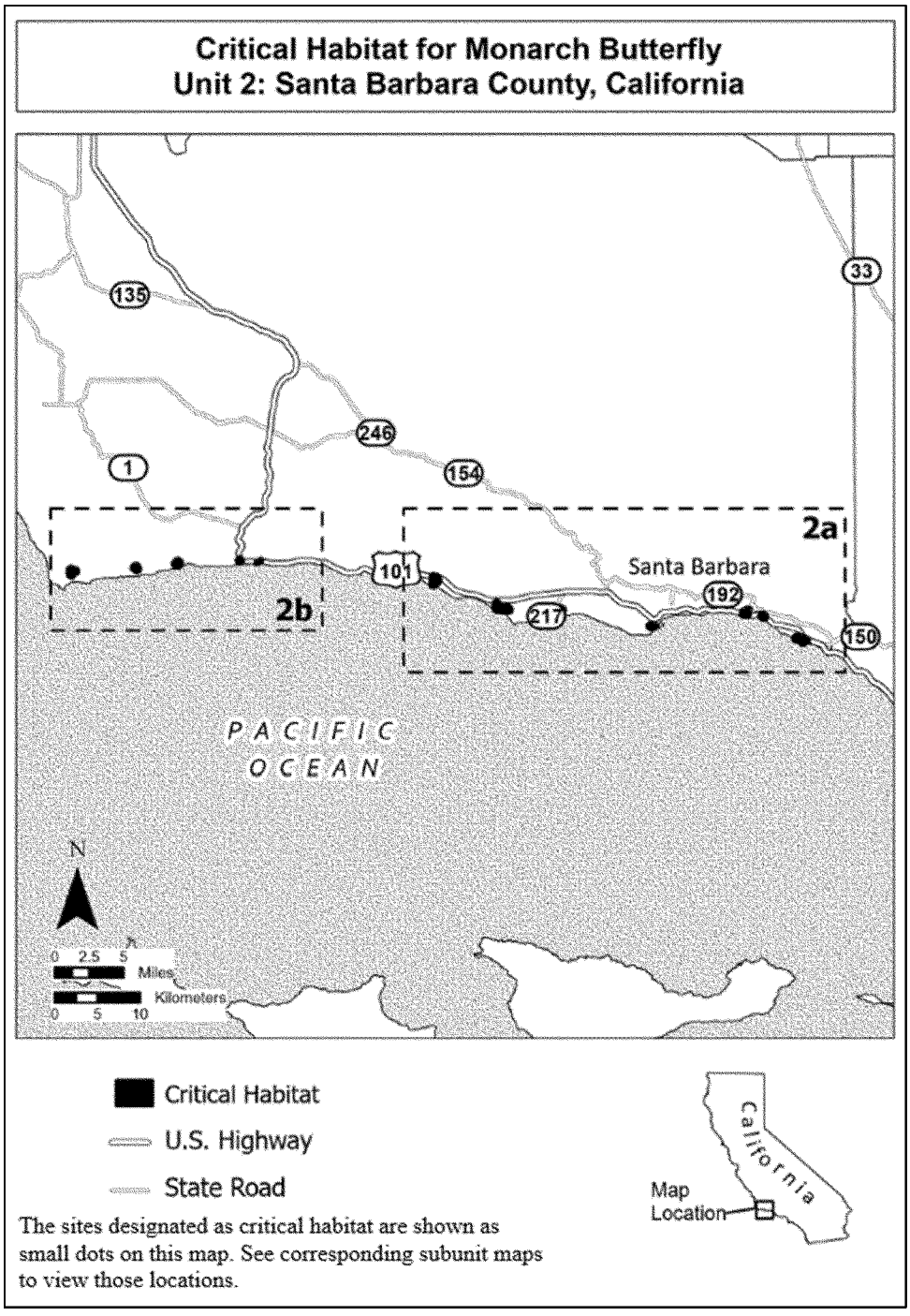


Figure 4 to Monarch Butterfly (*Danaus plexippus*) paragraph (7)(ii)

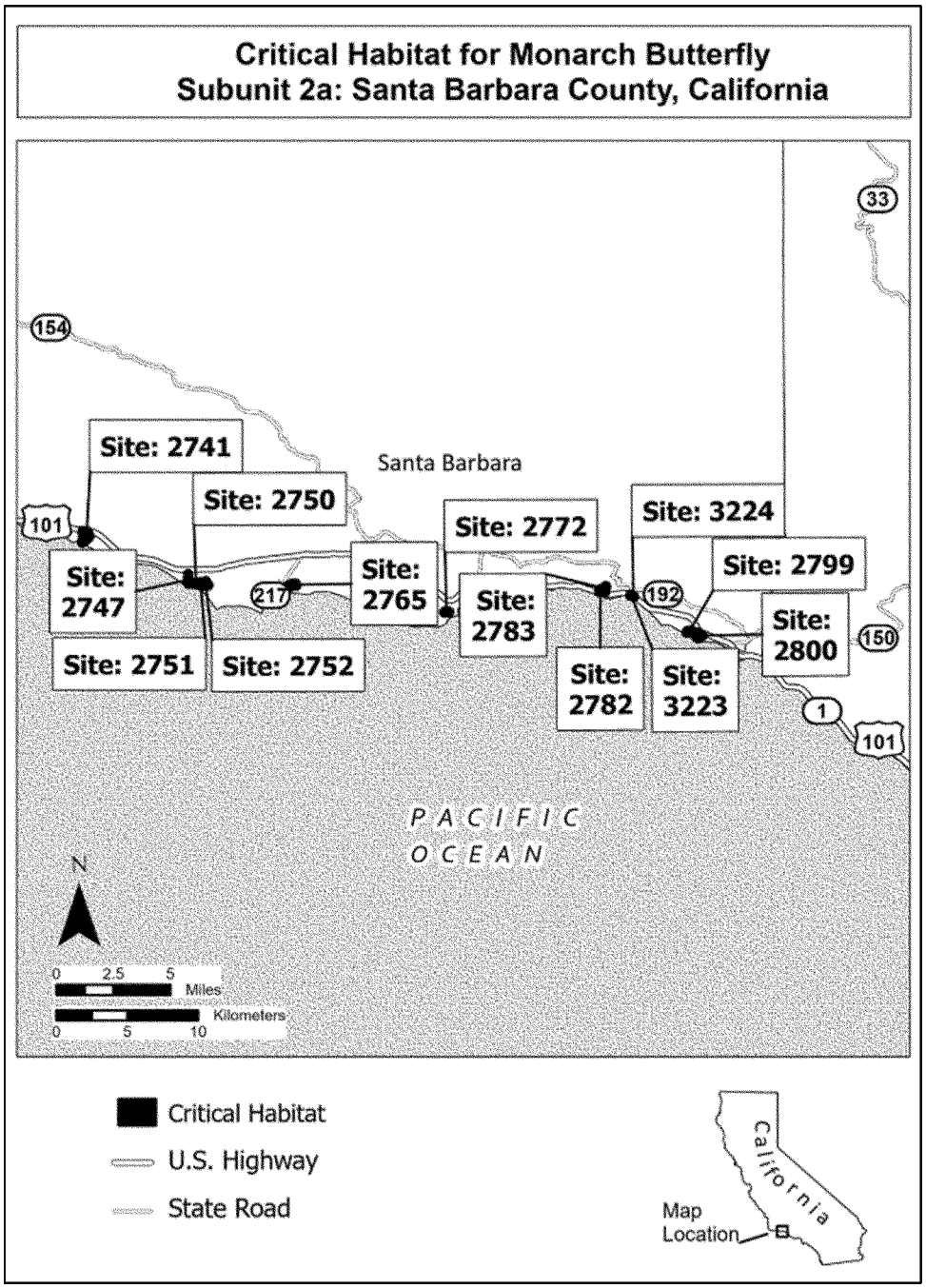
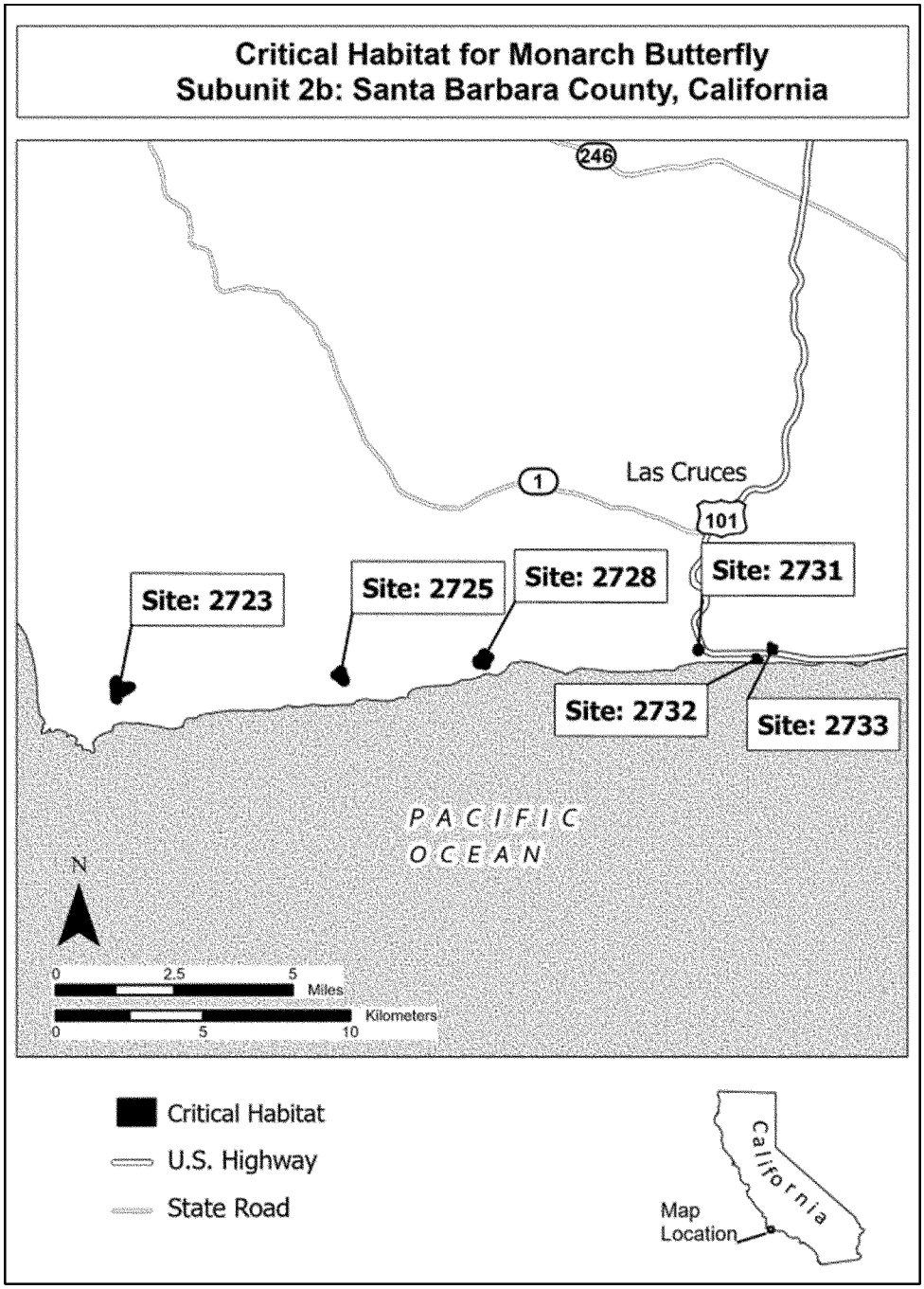


Figure 5 to Monarch Butterfly (*Danaus plexippus*) paragraph (7)(ii)



(8) Unit 3: San Luis Obispo County.

(i) Unit 3 consists of the following three subunits in San Luis Obispo County, California:

(A) Subunit 3a consists of 470 ac (190 ha). It includes the following areas: Pismo Beach (North Beach Campground) (site #3060), Halcyon Hill (site #3067), overwintering site in Oceano (site #3082), Blacklake I (site #3083), Blacklake II (site #3089), Woodlands Village Monarch Habitat (site #3167), and Callendar Road (site #3214).

(B) Subunit 3b consists of 639 ac (258 ha). It includes the following areas: Pecho Road (site #3043), Toro Creek (site #3051), Hazard Cove (site #3052), Monarch Lane (site #3053), Morro Bay State Park Campground (site #3055), Morro Bay Golf Course (site #3056), Camp Keep at Montana De Oro State Park (site #3058), Main and Surf Street (site #3076), Del Mar Park (site #3233), San Luis Obispo Creek (site #3245), and Cayucos Creek Road and State Highway 1 (site #3266).

(C) Subunit 3c consists of 403 ac (163 ha). It includes the following areas: Sebastian's Store (site #3045), Fiscalini Ranch (site #3046), Whitaker Flat (site #3071), Hamlet (site #3073), and overwintering site at Ragged Point 3 (site #3258).

(ii) Maps of Unit 3 follow:

Figure 6 to Monarch Butterfly (*Danaus plexippus*) paragraph (8)(ii)

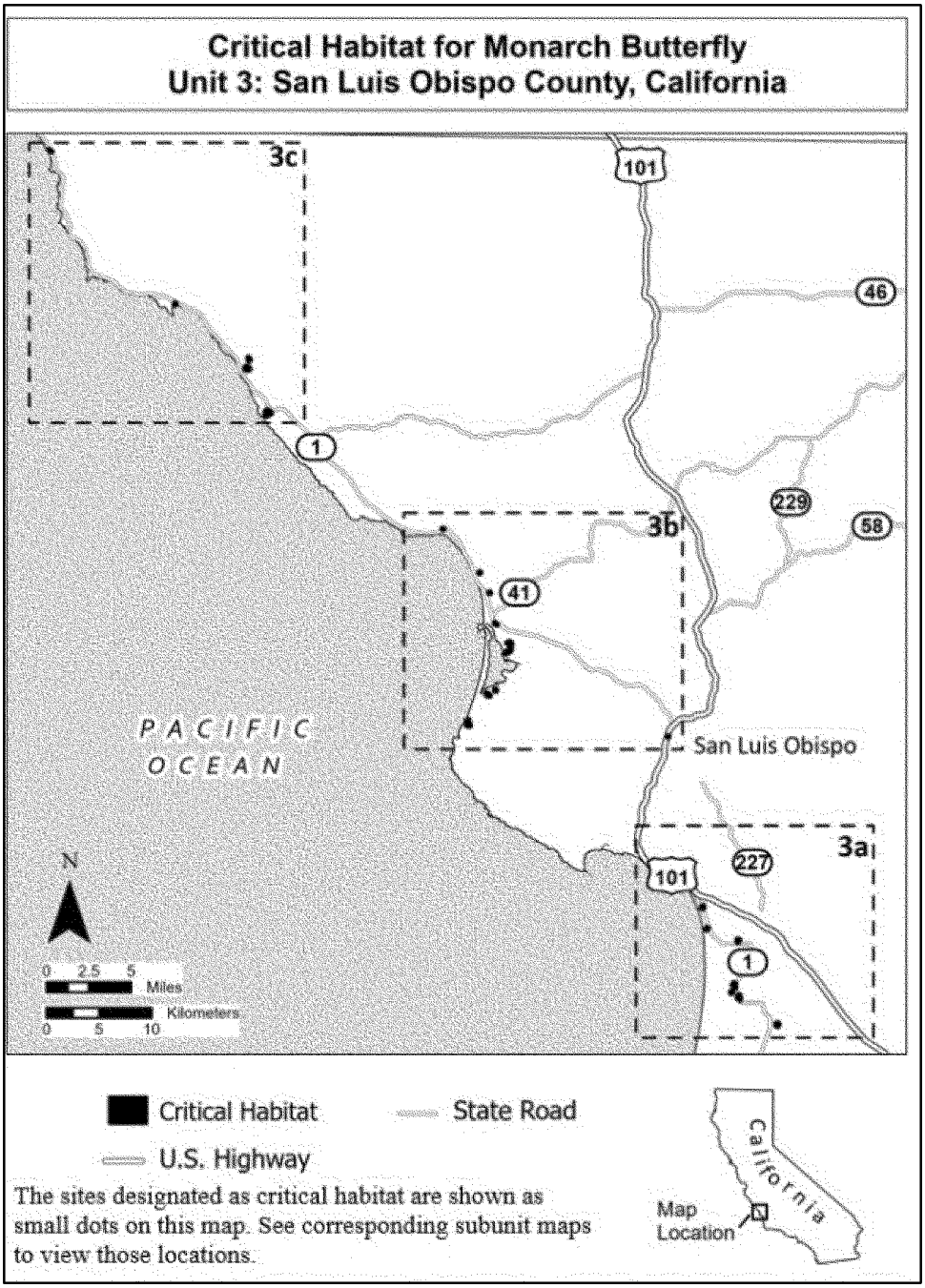


Figure 7 to Monarch Butterfly (*Danaus plexippus*) paragraph (8)(ii)

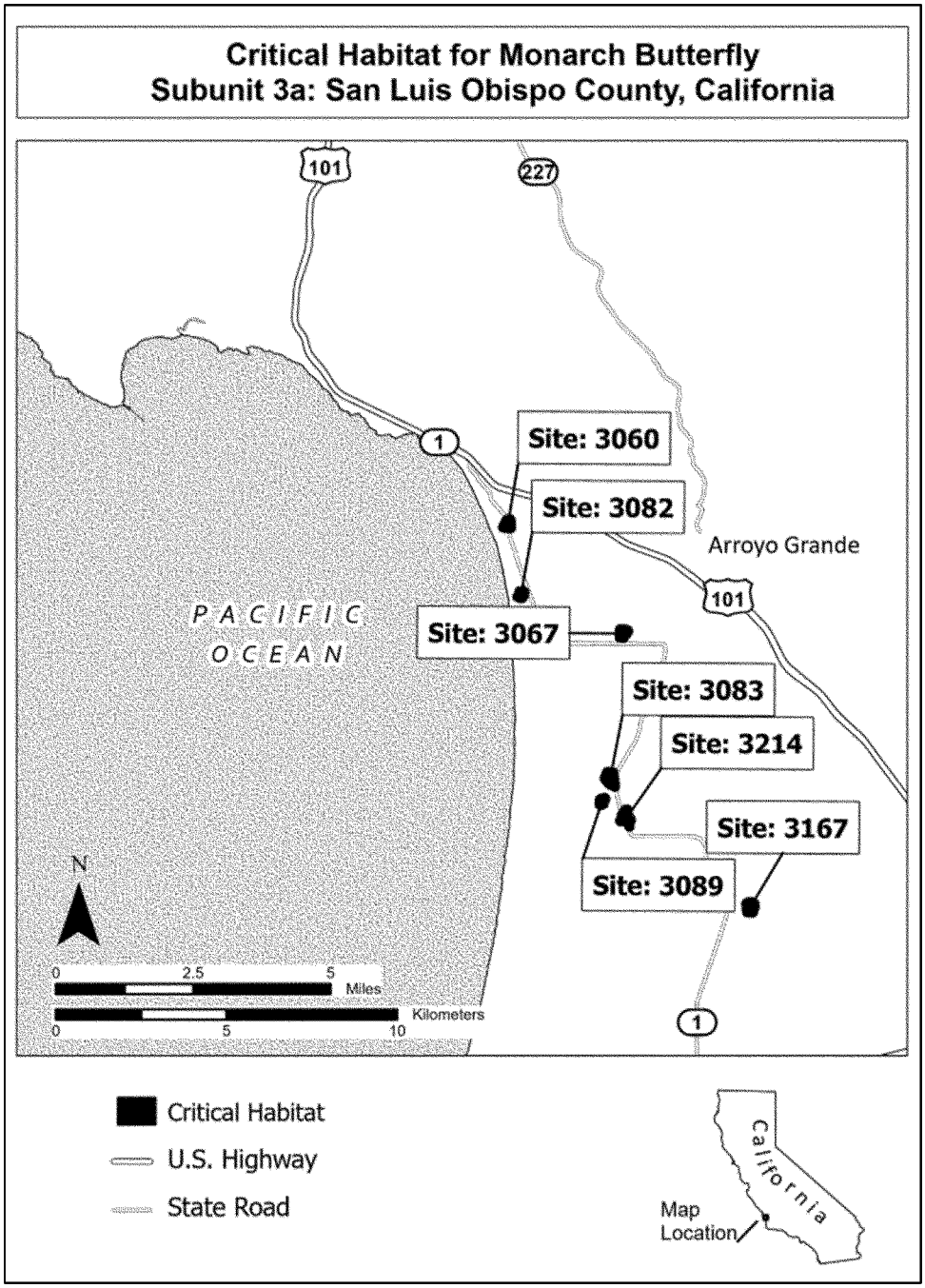


Figure 8 to Monarch Butterfly (*Danaus plexippus*) paragraph (8)(ii)

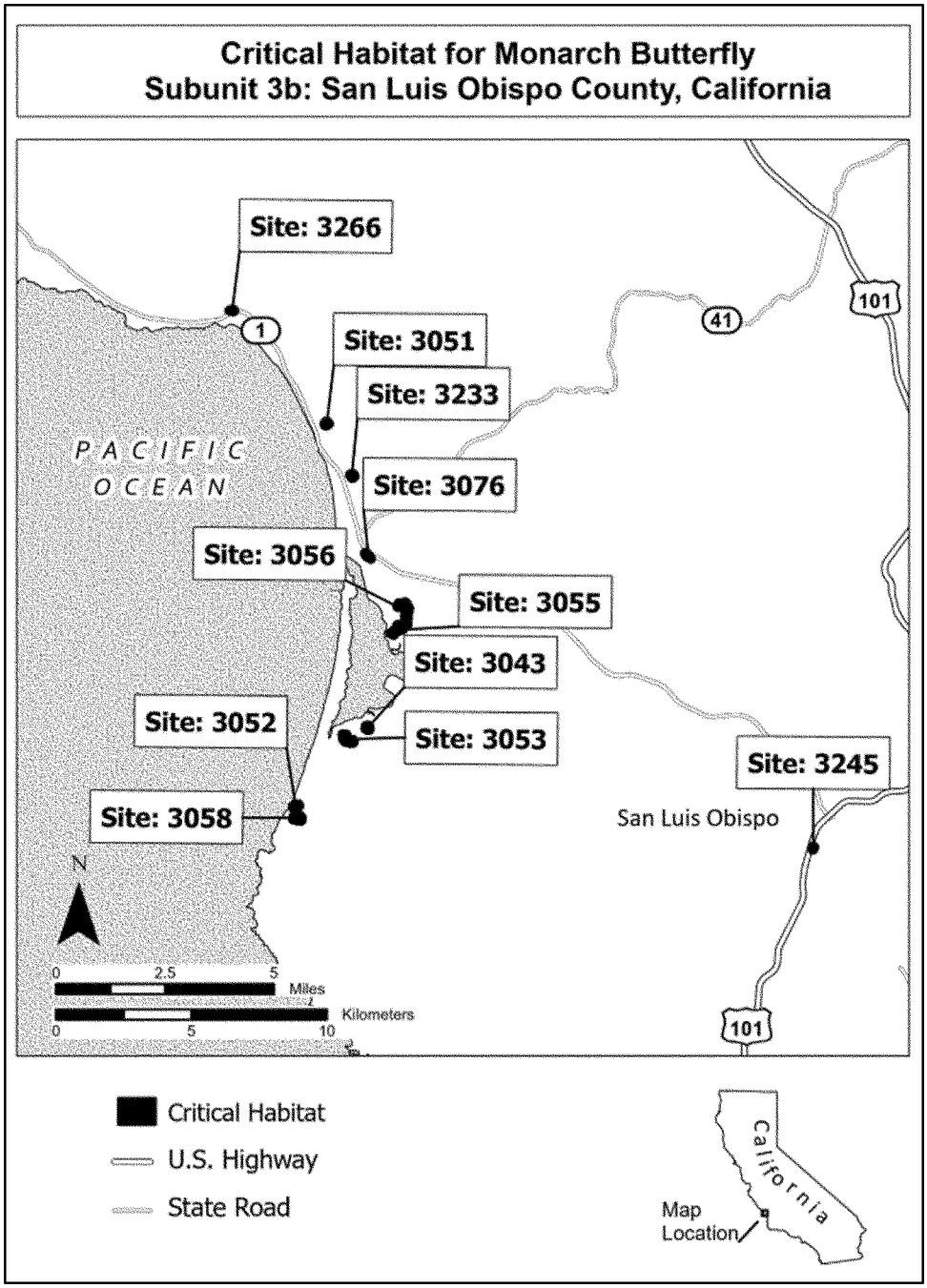
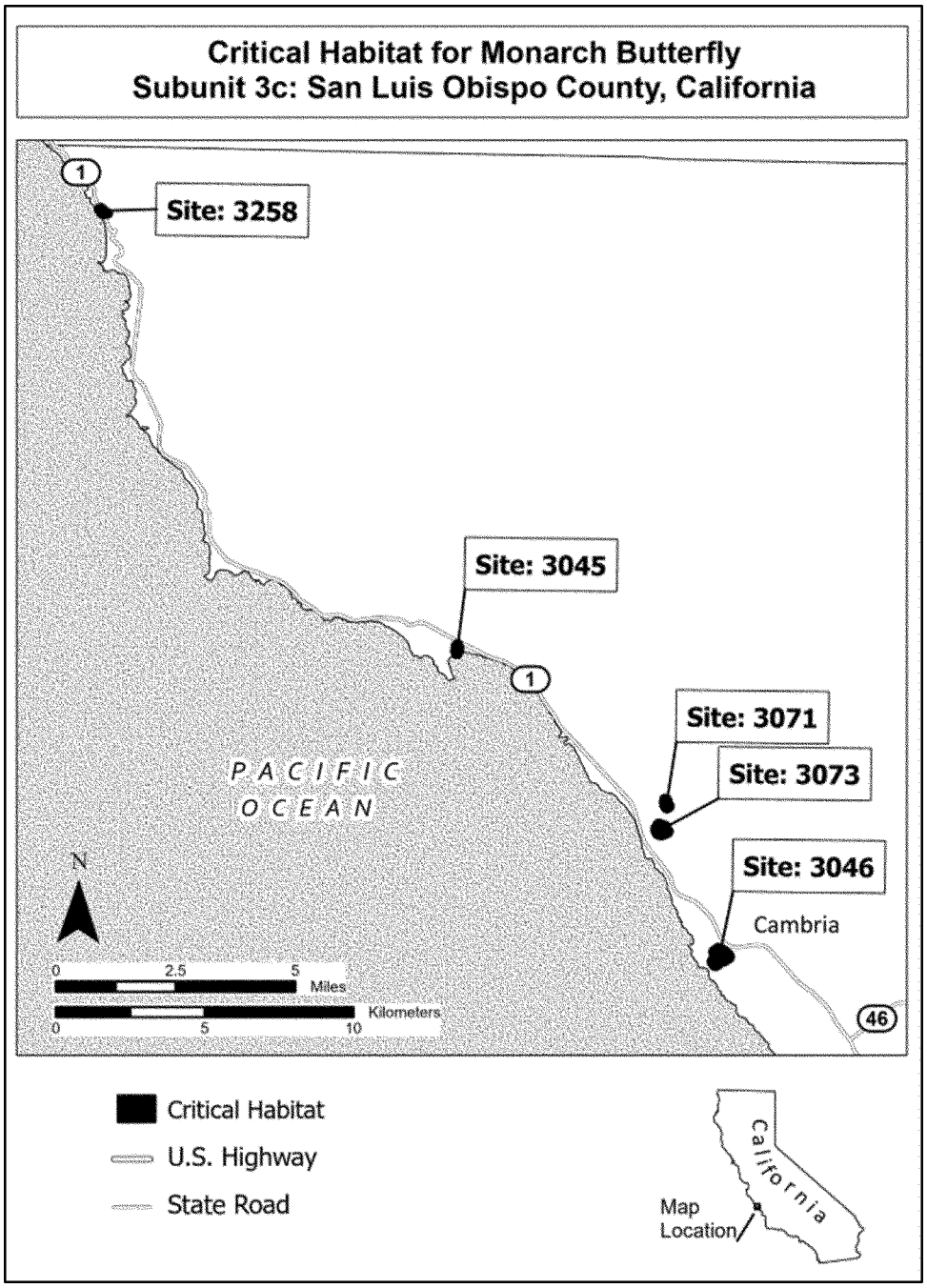


Figure 9 to Monarch Butterfly (*Danaus plexippus*) paragraph (8)(ii)

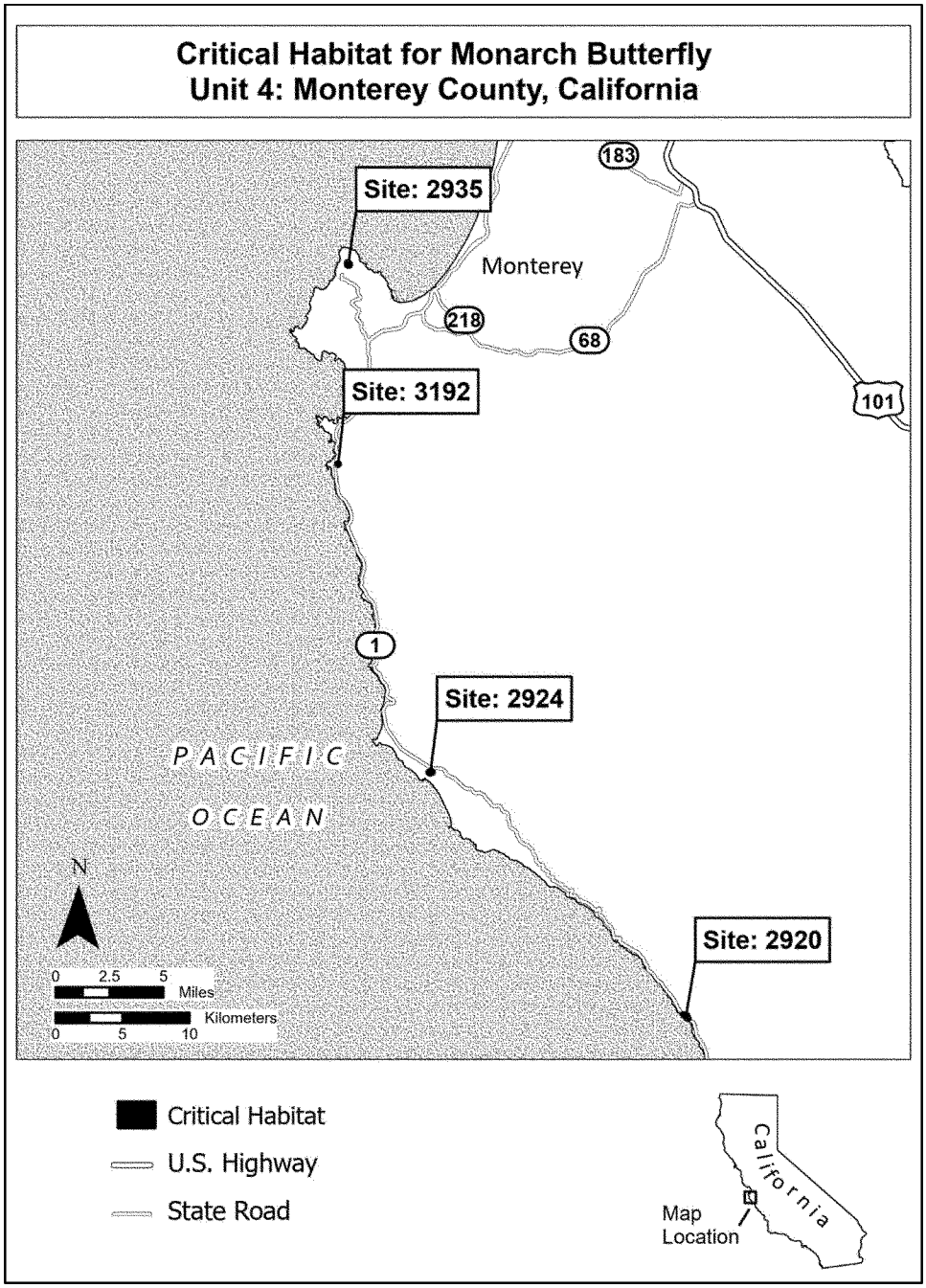


(9) Unit 4: Monterey County.

(i) Unit 4 consists of 204 ac (83 ha) in Monterey County, California. It includes the following areas: overwintering site near Big Sur (site #2920), Andrew Molera State Park (site #2924), Pacific Grove Monarch Butterfly Sanctuary (site #2935), and overwintering site in Monterey (site #3192).

(ii) Map of Unit 4 follows:

Figure 10 to Monarch Butterfly (*Danaus plexippus*) paragraph (9)(ii)

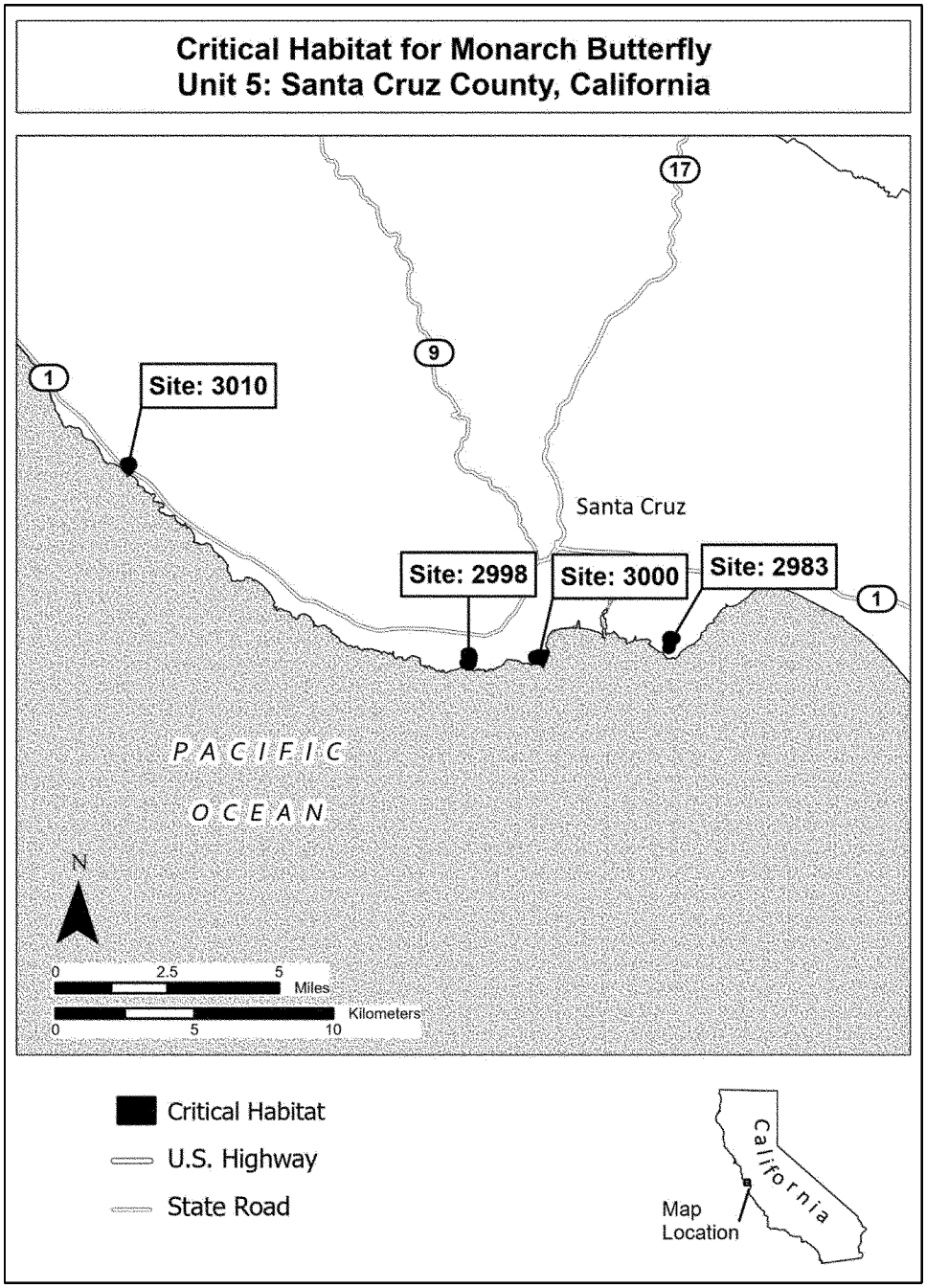


(10) Unit 5: Santa Cruz County.

(i) Unit 5 consists of 289 ac (117 ha) in Santa Cruz County, California. It includes the following areas: Moran Lake (site #2983), Natural Bridges State Park (site #2998), Lighthouse Field (site #3000), and Ocean View and Marine Drive (site #3010).

(ii) Map of Unit 5 follows:

Figure 11 to Monarch Butterfly (*Danaus plexippus*) paragraph (10)(ii)

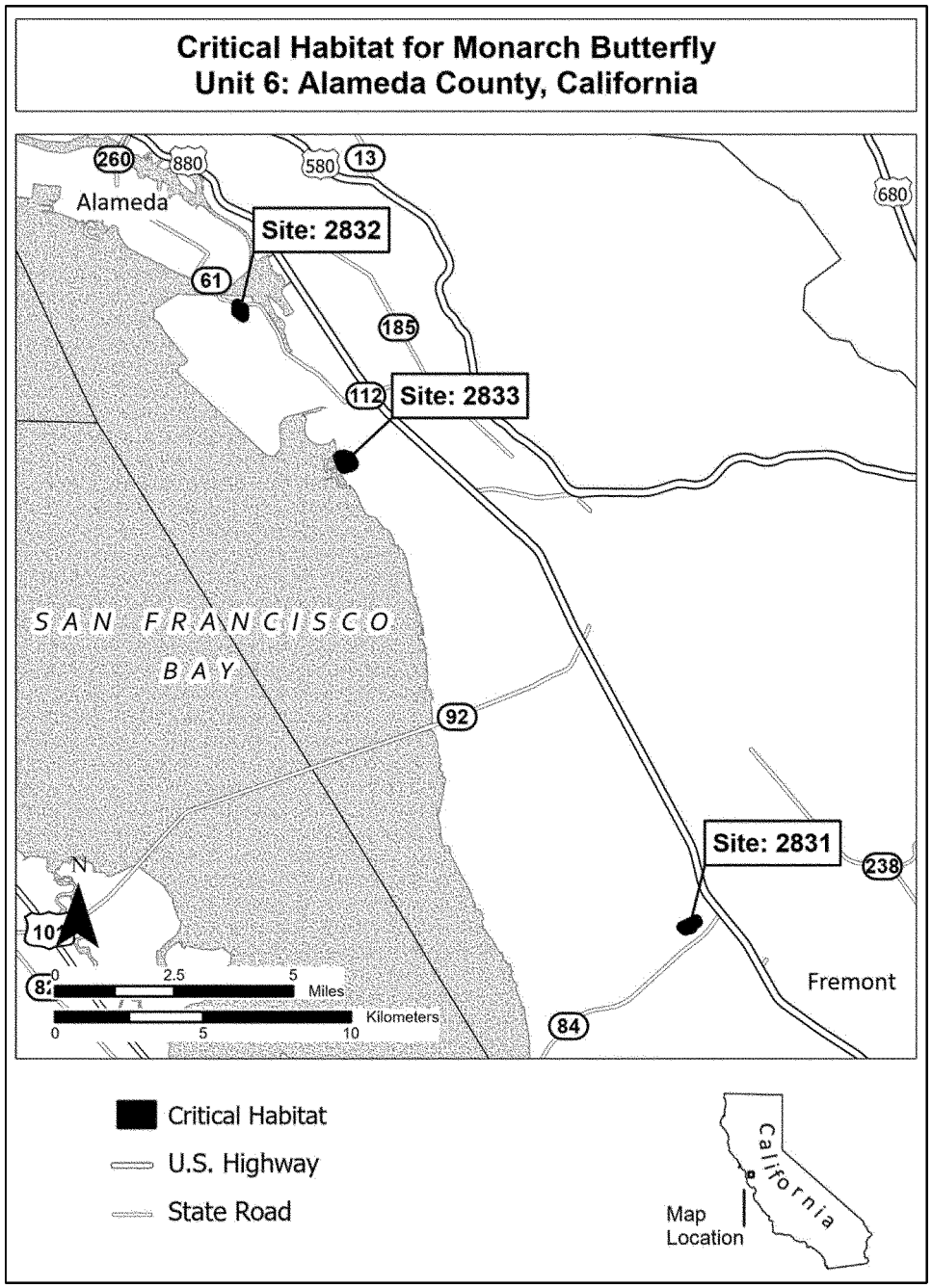


(11) Unit 6: Alameda County.

(i) Unit 6 consists of 261 ac (105 ha) in Alameda County, California. It includes the following areas: Ardenwood Historical Farm (site #2831), Chuck Corica Golf Course (site #2832), and San Leandro Golf Course (site #2833).

(ii) Map of Unit 6 follows:

Figure 12 to Monarch Butterfly (*Danaus plexippus*) paragraph (11)(ii)

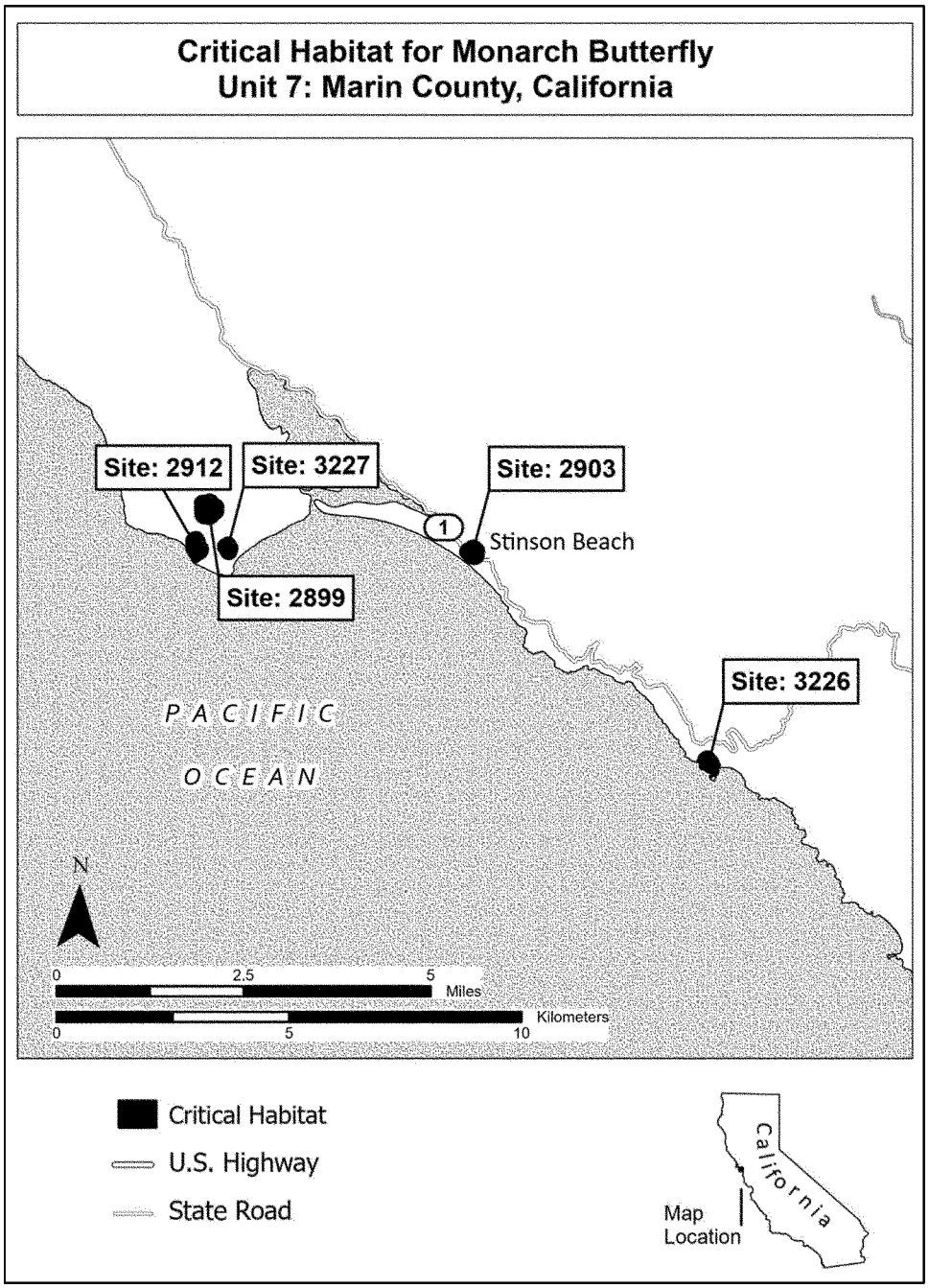


(12) Unit 7: Marin County.

(i) Unit 7 consists of 242 ac (98 ha) in Marin County, California. It includes the following areas: Purple Gate (site #2899), Chapman Ravine (site #2903), Alder Road (site #2912), Charlotte near Muir Beach (site #3226), and Juniper Road and Kale Road (site #3227).

(ii) Map of Unit 7 follows:

Figure 13 to Monarch Butterfly (*Danaus plexippus*) paragraph (12)(ii)



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Martha Williams,

Director, U.S. Fish and Wildlife Service.

[FR Doc. 2024–28855 Filed 12–11–24; 8:45 am]

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