United States Department of the Interior

FISH AND WILDLIFE SERVICE

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Memorandum

To: Regional Director, Great Lakes Region, U.S. Fish and Wildlife Service, Bloomington, MN

From: Assistant Regional Director, Division of Ecological Services, Great Lakes Region, U.S. Fish and Wildlife Service, Bloomington, MN

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Subject: Biological Opinion and Conference Opinion on the U.S. Fish and Wildlife Service's approval of a Conservation Benefit Agreement and Candidate Conservation Agreement and its issuance of an associated Endangered Species Act Section 10(a)(1)(A) Permit (2026-0048008)

The U.S. Fish and Wildlife Service (USFWS) proposes to sign a Nationwide Conservation Benefit Agreement and Candidate Conservation Agreement for Bumble Bees on Energy and Transportation Lands (CBA or Agreement) with the Energy Resources Center at The University of Illinois at Chicago (UIC). To accompany the Agreement, the Service would also issue UIC an enhancement of survival (EOS) permit under §10(a)(1)(A) of the Endangered Species Act (ESA). This document transmits our biological and conference opinion (Opinion) based on our review of the subject action and its effects on the eleven covered species. The covered species are the federally endangered rusty patched bumble bee (*Bombus affinis*) and Franklin's bumble bee (*B. franklini*), the proposed endangered Suckley's cuckoo bumble bee (*B. suckleyi*) as well as the Crotch's bumble bee (*B. crotchii*), southern plains bumble bee (*B. fraternus*), Morrison's bumble bee (*B. morrisoni*), western bumble bee (*B. occidentalis*), American bumble bee (*B. pensylvanicus*), yellow banded bumble bee (*B. terricola*), Ashton's cuckoo bumble bee (*B. bohemicus*), and variable cuckoo bumble bee (*B. variabilis*). This Opinion also addresses the subject action and its effects to non-covered species listed under the ESA as endangered or threatened or proposed for such listing; and, to designated and proposed critical habitat. We are issuing this Opinion in accordance with section 7 of the Endangered Species Act of 1973, as amended (Act) (16 U.S.C. 1531 et seq.).

The Agreement and the Permit will result in a net conservation benefit to the covered species. Based on the overall net benefit, it is also our conclusion that the proposed action is not likely to jeopardize the federally listed rusty patch bumble bee and Franklin's bumble bee nor proposed endangered Suckley's bumble bees' continued existence. The measures that Partners will implement under the Agreement and in accordance with the Permit will also ensure that effects caused by the Agreement or Permit are not likely to jeopardize the continued existence of any endangered, threatened, or proposed species and will not destroy or adversely modify proposed or designated critical habitat.

Actions caused by the Agreement or Permit that are not already subject to section 7 review will be subject to specific avoidance and minimization measures for listed and proposed plants and for designated and proposed critical habitat. The Partners will also be required to review each activity that they implement under the Agreement to ensure that they will not result in the take of any species of animal listed as endangered or threatened or proposed for such listing. The Service's ongoing participation in the implementation of the Agreement will include technical assistance and review of the Partners' actions, as needed, to ensure that these requirements are met.

Some of the information and analyses considered in this document were prepared under the version of the 50 CFR part 402 regulations in effect prior to the Court's order in Center for Biological Diversity v. Burgum, No. 24-cv-04651 (N.D. Cal., March 30, 2026), which vacated aspects of four provisions from the 50 CFR part 402 regulations governing interagency consultation under section 7 of the Endangered Species Act and reinstated the provisions that were previously in effect. We have reviewed this information and analyses, including but not limited to, the consultation request package, and confirmed that the content of that information and those analyses, including the identification and analyses of effects, would be the same under either version of the applicable regulations.

We based this Opinion on the Nationwide Conservation Benefit Agreement/ Candidate Conservation Agreement for Bumble Bees on Energy and Transportation Lands and additional information, as described in the Opinion.

Contents

1 Description of the Proposed Action 1
1.1 The Agreement and the Enhancement of Survival Permit 1
1.2 Participant Roles & Obligations 3
1.2.1 Energy Resources Center at the University of Illinois at Chicago (UIC) – Program Administrator 3
1.2.2 Partners 3
1.2.3 U.S. Fish and Wildlife Service 3
1.3 Covered Lands 3
1.4 Enrollment 4
1.4.1 Enrollment Period 4
1.4.2 Changes in Land Ownership or Management 4
1.4.3 Enrollment Process 4
1.5 Conservation Measures 7
1.5.1 Minimum Extent Expectations 8
1.5.2 Adaptive Management 9
1.5.3 Compliance Tracking and Reporting 9
1.5.4 Monitoring 9
1.6 Covered Activities 9
1.7 Changes to Enrolled Lands 10
1.8 Monitoring 10
1.8.1 Suitable Habitat Criteria 10
1.8.2 Monitoring Methods 12
1.9 Neighboring Landowner Agreement 13
2 Status of the Covered Species 13
2.1 Distribution 13
2.2 Factors Influencing the Status of the Species 15
2.2.1 Loss of Nesting and Overwintering Habitat 15
2.2.2 Loss of Foraging Habitat 16
2.2.3 Exposure to Stressors and Direct Impacts 17

2.2.4 Lack of Knowledge and Understanding 18
2.2.5 Climate Change 18
2.2.6 Small Population Dynamics 19
3 Environmental Baseline 19
3.1 Action Area 19
3.2 Covered Lands Description 20
3.3 Activities in the Action Area 21
3.3.1 Energy Sector - Transmission Power Line Rights-of-Way 21
3.3.2 Energy Sector - Substation Parcels 21
3.3.3 Energy Sector - Electric Generation Sites 22
3.3.4 Energy Sector - Oil and Gas Rights-of-Way 22
3.3.5 Transportation Sector - Transportation Rights-of-Way 22
3.3.6 Transportation Sector - Access-controlled Roadways (Interstates and Tollways) 23
3.3.7 Transportation Sector - Highways (U.S. or State-Marked Routes) 23
3.3.8 Transportation Sector - Special Management Areas 24
3.3.9 Transportation Sector - County and Local Roadways 24
3.3.10 Transportation Sector - Railroad Rights-of-Way 24
3.3.11 Transportation Sector - Transportation Parcels 24
3.4 Status of the Species in the Action Area 25
3.4.1 Populations and Trends 25
4 Effects of the Action 30
4.1 Effects to the Covered Species 30
4.1.1 Anticipated Extent, Timing, and Duration of Enrollment 30
4.2 Effects to Listed and Proposed Animal Species 39
4.3 Effects to Listed and Proposed Plants and Critical Habitat 40
4.4 Cumulative Effects 41
5 Summary of Effects of the Action 41
6 Conclusion 42
7 Incidental Take Statement 43

7.1 Relationship to Enhancement of Survival Permit & the CBA 43
7.2 Relationship to Candidate Conservation Agreement 44
7.3 Amount or Extent of Take 45
7.3.1 Use of a Surrogate to Express the Extent of Anticipated Take of Covered Species 45
7.3.2 Causal Link between the Surrogate and Incidental Take of the Covered Species 45
7.3.3 Amount of Anticipated Take as Reflected by the Surrogate Measure – Implementation Acres 45
7.3.4 Why it is not practical to Monitor Take-Related Impacts in Terms of Individual Bumble Bees 46
7.4 Reasonable and Prudent Measures 46
7.5 Terms and Conditions 47
7.5.1 T&C #1 (RPM #1). Notify and coordinate with Federal land management agencies. 47
7.6 Monitoring and Reporting Requirements 47
8 Reinitiation Notice 48
9 Conservation Recommendations 49
10 Literature Cited 49

Figures

Figure 1. Estimated ranges of the eleven bumble bees includes as covered species in the Agreement. The bottom right map shows a combined range map for all covered species. Ranges are based on current and historic observations 15

Figure 2. Operational Rights-of-Way Zones Used for Initial Categorization of Activities 24

Tables

Table 1. The eleven covered bumble bee species and federal status under the Endangered Species Act (ESA) under this Agreement 1

Table 2. Sampling plots required for biological effectiveness monitoring based on the acreage of Enrollment Lands 12

Table 3. Anticipated acreage of enrollment under the Agreement by either Energy Sector or Transportation Sector. Along with the annual minimum amount of conservation measure implementation

required, and the required habitat set-asides on enrolled lands for each Partner. Note that combined sector enrollments will be split between both sectors for the Opinion's analysis.....22

Table 4. At-risk bumble bees included in the Agreement as covered species, their common name, scientific name, Federal listing status, and their estimated population declines.....27

Table 5. High Enrollment scenario estimates for conservation measure/habitat set-aside implementation acreage and high enrollment scenario nest estimates based on annual estimated benefits by sector during enrollment under the Agreement. See Appendix D in the Agreement for more details of the enrollment estimates included in the analysis.....33

Table 6. Annual estimates of effects of cumulative actions and estimated net conservation benefit (i.e., the Net Change in Nests) on covered species nests by the baseline and the effects analysis for the cumulative actions by Partner sector. Estimates are for 1,000 acres. Positive values indicate actions that are expected to result in positive effects on the covered species nests, while negative values indicate actions expected to result in negative effects on the covered species nests. See Appendix D of the Agreement for a breakdown of all the Agreement's actions and estimate effects analysis.....33

Table 7. An example scenario, equivalent to the High Enrollment scenario analyzed in the opinion for the Agreement period of 35 years – in which 28,000,000 acres are enrolled in the Agreement and divided between the two major sectors, as shown. In this scenario, the anticipated level of incidental take would not be exceeded as long as there are at least 2,240,000 Implementation Acres for the entire Agreement.48

1 DESCRIPTION OF THE PROPOSED ACTION

1.1 THE AGREEMENT AND THE ENHANCEMENT OF SURVIVAL PERMIT

The U.S. Fish and Wildlife Service (Service) proposes to sign a Nationwide Conservation Benefit Agreement for Bumble Bees on Energy and Transportation Lands (CBA or Agreement) with the Energy Resources Center at The University of Illinois at Chicago (UIC or Programmatic Administrator). To accompany the Agreement, the Service would also issue UIC an enhancement of survival (EOS) permit under §10(a)(1)(A) of the Endangered Species Act (ESA). Once both parties sign the Agreement and after the Service issues the permit, UIC would be able to issue certificates of inclusion (CI) to rights-of-way landowners (Partners). The Agreement would remain in effect for 35 years. The Agreement covers eleven at-risk bumble bee species (Table 1).

Table 1. The eleven covered bumble bee species and federal status under the Endangered Species Act (ESA) under this Agreement.

Common Name	**Scientific Name**
Rusty patched bumble bee	*Bombus affinis*
Crotch's bumble bee	*Bombus crotchii*
Franklin's bumble bee	*Bombus franklini*
Southern plains bumble bee	*Bombus fraternus*
Morrison's bumble bee	*Bombus morrisoni*
Western bumble bee	*Bombus occidentalis*
American bumble bee	*Bombus pensylvanicus*
Yellow banded bumble bee	*Bombus terricola*
Ashton's cuckoo bumble bee	*Bombus bohemicus*
Variable cuckoo bumble bee	*Bombus variabilis*
Suckley's cuckoo bumble bee	*Bombus suckleyi*

After receiving a CI, Partners are required to carry out bumble bee conservation actions on their Enrolled Lands. Specifically, each Partner must implement the two mandatory conservation measures under Objective 1, which focuses on bumble bee nesting and overwintering habitats. Beyond this mandatory measure, Partners have the flexibility to select three additional conservation measures from Objectives 2 through 5. These selections must meet the minimum requirements for at least one conservation measure from each of the three chosen objectives, as described in Section 6 of the Agreement. This approach allows Partners to tailor their conservation efforts while still meeting the overall goals of the program.

Assuming compliance with the terms of the Agreement, the EOS Permit would authorize Partners to take covered bumble bees incidentally because of conservation measure implementation or because of "covered activities" which are ongoing maintenance, operations, and modernization activities (See section 5 of the Agreement for more details). Any take that would occur under this Agreement would be above the baseline conditions for the enrolled Partner, thus providing a net conservation benefit to covered species. Additionally, Partners would be required to ensure that their activities are not likely to cause take of any listed or proposed animal species other than the covered species unless the take is exempted under

the provisions of an incidental take statement or authorized under another section 10 permit. Before UIC would issue them a CI, each Partner would also have to agree to implement certain measures to avoid or minimize effects to listed or proposed plant species and to designated or proposed critical habitat. Potential partners will be required to include a description of those avoidance and minimization measures (AMM) with their CI applications. UIC will be the designated non-federal representative for the Service and will prepare a compliance form for the Service to quickly review that includes any necessary AMMs to ensure that no activity carried out in pursuit of the Agreement or that is authorized by the Permit is likely to jeopardize any listed or proposed plant species or would be likely to destroy or adversely modify proposed or designated critical habitat.

The purpose of a CBA is to provide incentives for non-Federal property owners to act in a manner that results in a net conservation benefit to the covered species. By consenting to the Agreement, Partners agree to address the key threats to the covered species that are under their control. In return, the Service assures them that for currently listed or possible future listed covered species no additional conservation measures beyond those in the Agreement would be required for enrolled Partners for the covered activities. For example, if American bumble bees were listed, the Service would not impose additional land, water, or resource use limitations on participating landowners to conserve American bumble bees on enrolled non-Federal lands unless they consent to such changes so long as they are in compliance with the Agreement, CI, and Permit. The Service would issue the Permit to UIC upon signing the Agreement, but it would not go into effect for the nine non-listed covered species unless one of these species is listed as endangered or threatened because the ESA does not prohibit take of non-listed species. As stated above, however, Partners would be expected to carry out specific measures to conserve all covered species, including non-listed species, when UIC issues them a CI.

The Agreement is integrated with a Candidate Conservation Agreement (CCA) for conservation measures and covered activities implemented on Federal lands. Though referred to as simply a CCA (which technically applies to only candidate species), in the context of the Agreement this is inclusive of listed and non-listed, non-candidate covered species as well. Entities enrolling and implementing conservation measures on Federal lands will not receive the regulatory assurances or incidental take coverage provided by the Section 10 EOS Permit. However, these entities may opt to use Section 7 reviews and consultations resulting from inclusion under the Agreement for other related actions on the enrolled Federal lands, which may streamline the Federal action agencies' Section 7 consultation requirements.

The conservation goal of this Agreement is to sustain and improve covered species foraging, nesting, and overwintering habitat. This measurable biological goal for the Agreement can be comparted over time against the baseline conditions for each Partner.

1.2 PARTICIPANT ROLES & OBLIGATIONS

1.2.1 Energy Resources Center at the University of Illinois at Chicago (UIC) – Program Administrator

UIC will hold the EOS Permit, subject to Service oversight consistent with 50 CFR § 13.21(e)(2). UIC will maintain positions for program administration to facilitate enrollment of Applicants in the CBA and distribute information for conservation efforts through coordination with other state and Federal agency staff and outreach to Partners and landowners. UIC will also serve as the fiscal agent for this Agreement, including management of a non-wasting endowment to fund permit and program administration activities that will benefit the covered bumble bee species through coordination of annual Partner reporting and collaboration that addresses habitat restoration, enhancement, and the removal of threats.

Section 7.1 of the CBA describes the obligations to which UIC would agree as Program Administrator. They include the suspension, in whole or in part, or revocation, of the Certificate of Inclusion of any Partner found to be in non-compliance with the requirements of the Agreement.

1.2.2 Partners

Any non-Federal person or entity with a fee-owned, leasehold, easement, or other property interest on lands managed for energy and transportation purposes is eligible to become a Partner in the Agreement. Partners must be able to carry out the conservation measures and covered activities described in the Agreement and the attached CI on their Enrolled Lands, subject to applicable local, state, other Federal, and tribal law. By executing a CI, the Partner agrees to the obligations and responsibilities identified in the CI and the Agreement.

Applicants will likely include non-Federal landowners and other entities who manage lands associated with energy generation, transmission and distribution, as well as a network of individual state or county departments of transportation. Several of the prospective Partners worked with UIC and the Service to help develop the Agreement. Specific obligations of the Partners are described in Section 7.3 of the Agreement.

1.2.3 U.S. Fish and Wildlife Service

The Service's obligations are described in section 7.2 of the Agreement.

1.3 COVERED LANDS

Enrolled lands may include both non-Federal and Federal lands, as follows:

- Non-Federal Enrolled Lands are the non-Federal areas to which the Agreement's assurances apply and on which the Service would authorize the incidental take of the covered species under the Permit.
- Partners may enroll Federal lands only to the extent that the non-Federal Partners maintain easements, leases, or permits on those lands for energy or transportation infrastructure that would allow for their implementation of the covered species conservation measures. Assurances and incidental take of the covered species are not authorized through the EOS permit on CCA lands

(i.e., Federal lands), but Partners and other Federal agencies reviewing their activities receive regulatory predictability through the Section 7 consultation conducted in association with this Agreement.

- Lands managed by energy and transportation Partners within the ranges of the covered species which make up the contiguous U.S. comprise the area that may be covered by the Agreement (Figure 1). See Section 4.2 Covered Lands, in the Agreement. The Agreement allows Partners to implement conservation measures strategically on their enrolled Lands, where they are likely to benefit the covered species and where land use and authorities are compatible. Partners may shift placement of conservation measures over time to address conservation needs of the species, interests of other underlying or adjacent landowners, local laws, regulations, or other constraints that may limit the ability to apply conservation measures in a given area.

1.4 ENROLLMENT

1.4.1 Enrollment Period

Eligible Applicants may be enrolled at any time over the duration of the Agreement (35 years).

1.4.2 Changes in Land Ownership or Management

Lands owned, leased, easement-held, or otherwise managed by enrolled Partners, including lands acquired after-initial enrollment, can be added, transferred, or removed, to/from the existing enrolled lands as a modification to the CI. Modification of a Partner's CI will be permitted to encourage consistent land management, maintain voluntary enrollment, and increase habitat managed for the covered species. Changes in enrolled lands (added or removed) will be reported to the Program Administrator in Partner annual reports, and modifications will be made to the Partner's CI according to the requirements outlined in the Agreement.

1.4.3 Enrollment Process

The Applicant shall provide the Program Administrator with sufficient information regarding the property or lands it seeks to enroll for UIC to verify if they are in the covered area and eligible for enrollment. The Applicant will also review the Agreement obligations, define their anticipated enrolled lands, and identify the conservation measures applicable to the lands they are enrolling. Section 4.4 of the Agreement further details the information that the Applicant must provide to help characterize the anticipated enrolled lands, proposed conservation measures, baseline easement, and Section 7 information.

1.4.3.1 *Future Reviews to Ensure Ongoing Section 7 Compliance*

To comply with §7(a)(2), the Service must ensure that its actions are not likely to (1) jeopardize the continued existence of any listed species or (2) destroy or adversely modify any designated critical habitat. In addition, §7(a)(4) requires agencies to carry out an intra-Service conference for any actions that are likely to jeopardize proposed species or to destroy or adversely modify proposed critical habitat. To ensure compliance with the two sections, we must evaluate and describe the likely consequences of

the Service's approval of the Agreement and its authorization of covered species incidental take under the Permit.

Although the analyses that we conduct to comply with §7(a)(2) and §7(a)(4) are similar, they have different procedural outcomes. Section 7(a)(2) forbids federal agencies from implementing any action that is likely to jeopardize listed species or to destroy or adversely modify critical habitat. Under §7(a)(4), agencies must confer with the Service if their action is likely to jeopardize proposed species or to destroy or adversely modify proposed critical habitat. Therefore, we must ensure that ongoing Section 7 compliance ensures the §7(a)(2) protections for listed species and critical habitat, while also ensuring that we identify any action that would require a conference under §7(a)(4).

In this biological opinion, we evaluate the likely effects of the proposed action on the CBA's covered bumble bee species, proposed and listed species and proposed and designated critical habitat. At this stage – before the Service and UIC have signed the Agreement and before the Program Administrator has issued any CIs – we do not know specifically where Partners will carry out activities within the covered area (Fig. 1). Therefore, we must rely on the structure of the Agreement and the conditions of the Permit to determine whether they are sufficient to ensure compliance with §7(a)(2) and §7(a)(4) of the ESA.

1.4.3.1.1 Reviews of Applications for Certificates of Inclusion

To help ensure broad compliance with Section 7 and to account for the broad scope of the proposed action, the Program Administrator, in cooperation with the Service, will carry out additional reviews of the potential effects to non-covered species and critical habitats when potential Partners apply for a CI. Potential Partners will follow the Enrollment Steps outlined in Section 4.4.1 of the Agreement. Specifically, Section 4.4.1(2)(j) to ensure all information needed for Section 7 compliance review is complete.

The Program Administrator will review the information provided by each Applicant to confirm section 7 compliance before issuing a CI. The objective of this review will be to determine whether the inclusion of the Applicant in the Agreement and the authorization of the related covered species incidental take through the Permit would allow for the Service's ongoing compliance with sections 7(a)(2) and section 7(a)(4). To streamline these reviews, the Service has designated the Program Administrator (UIC) as a designated non-federal representative for the Service for these Section 7 compliance reviews. See Appendix A for a copy of this signed letter. As such, the Program Administrator will complete a short compliance form that will be developed collaboratively with the Program Administrator and the Service. Once completed the Program Administrator will submit the compliance form along with the application materials to the Service. Once received the Service will have 30 days to review and provide any comments back to the Program Administrator. If UIC does not receive any comments back from the Service, the Program Administrator can note that the section 7 review process has been completed. During this review, the Service and the Program Administrator will determine whether:

1. The AMMs proposed by the applicant are sufficient to ensure that actions caused by the Agreement and Permit will neither jeopardize the continued existence of any listed or proposed plant species nor destroy or adversely modify any designated or proposed plant or animal critical habitat.

2. The Applicant will ensure that its implementation of covered species conservation measures and covered activities will not cause take of any non-covered listed or proposed animal species (see next section).

If the Service or the Program Administrator, acting as the designated non-federal representative, finds that the proposed AMMs are insufficient to ensure ongoing compliance with §7(a)(2) and §7(a)(4), it will work with the Applicant to revise the application.

To ensure that AMMs will be used for their intended purpose, the agreement also includes a checklist for Partners to determine what projects fit the definition of a covered activity. Use of the checklist would prompt the Partners to consider the following statement:

- For actions that are not covered by a separate section 7 consultation, the activity incorporates all avoidance and minimization measures attached to the Certificate of Inclusion that are applicable to any listed or proposed plant species, or Federal designated or proposed plant or animal critical habitat that is likely to occur in the action area or to overlap with the action area, respectively. For technical assistance, contact the local USFWS Ecological Services field office (https://www.fws.gov/offices/). Action area means all areas to be affected directly or indirectly by the action and not merely the immediate area involved in the action.

1.4.3.1.2 Ensuring No Take of Non-Covered Listed and Proposed Animal Species under the Agreement

Potential Partners will not be required to provide AMMs for listed and proposed animals but will be required to ensure that any activity implemented pursuant to the Agreement or under the authority of the Permit would not result in their take.

As they implement the Agreement, Partners will be required to ensure that the following statement is true for each conservation measure and covered activity carried out under the Agreement:

- The activity is not likely to cause take of federally listed or proposed wildlife species, other than covered species, *unless that take is covered under another existing Section 7 consultation or Section 10 Permit*. For actions that are not covered under another Section 7 consultation or Section 10 Permit, there is information on record to support at least one of the following two conclusions:
    - No listed or proposed animal species are likely to be exposed to the activity directly or to any stressors generated by the activity.
    - One or more listed or proposed animal species may be exposed to the activity directly or to one or more stressors generated by the activity, but that exposure will *not* result in the incidental take of one or more individuals. For technical assistance, contact the local USFWS Ecological Services field office (https://www.fws.gov/offices/). Note that USFWS field offices will not be expected to provide explicit or written concurrence or non-concurrence with the Partner's determination as to whether or not an activity is likely to result in the take of a listed or proposed species of fish or wildlife. They will be available to provide technical assistance to Partners to help them make this determination.

We anticipate that the preclusion of any take of listed or proposed wildlife will be sufficient to ensure compliance with Section 7. If, however, the Service or the Program Administrator, acting as the designated non-federal representative, determines that the Applicant would have to adopt additional AMMs with respect to any wildlife species to ensure such compliance, it will work with the Applicant and the Program Administrator to ensure that sufficient measures are incorporated into their certificate of inclusion. If they wish, Applicants may affirmatively provide such additional measures as part of their application.

As part of its responsibilities under the Agreement (see section 1.2 *Participants and Their Roles*, above), the Service will provide technical assistance to the Partners, as needed, to assist them in determining that Actions implemented under the Agreement or under the authority of the Permit will not result in take of any listed or proposed animal species other than covered species, as authorized.

1.5 CONSERVATION MEASURES

Partners that receive CIs commit to implementing certain measures that address the loss of covered species habitat resulting from land conversion, herbicide use, or mowing due to maintenance and modernization activities on energy and transportation lands. In most cases, energy and transportation lands are already actively managed to prevent the growth of trees and woody vegetation resulting in lands that are generally maintained as grassland, meadow, prairie, or shrub-scrub type habitats, all of which provide habitat for species that depend, at least during part of their life cycle, on early successional plant communities, such as bumble bees.

To enroll in the Agreement, each Partner must implement the two mandatory conservation measures that specifically addresses threats to nesting and overwintering habitat. Additionally, each Partner must select one conservation measure under three of the four remaining identified conservation objectives to implement (see Table 6-2 in the Agreement). Partners will select their conservation measures during the application process; however, these conservation objectives and measures can later be changed through a modification of their CI. Partners will base conservation measures selected on actions within their control and their management ability with respect to those threats.

See Table 6-2 in the Agreement contains summary descriptions of conservation objectives and measures, the key threats that each would address, their intended purposes, and implementation examples. Conservation measures listed in the table include:

1) **Manage, protect, and enhance nesting and overwintering habitat**
    - Suitable habitat set asides (mandatory), and
    - Avoidance of known or observed nest sites (mandatory).

2) **Manage, protect, and enhance foraging habitat**
    - Targeted herbicide treatment,
    - Seeding and planting diverse and native floral resources,
    - Conservation mowing,
    - Brush removal that sustains native floral resources,

- Prescribed burning, or
- Prescribed grazing.

3) **Minimize exposure to stressors and direct impacts**
   - Targeted herbicide treatment,
   - Reduce managed bee conflicts,
   - Mowing to reduce exposures to pesticides and physical risks,
   - Reduce exposures to mowing related stressors, and
   - Reduce pesticide exposure via Partner-specific policies and planning.

4) **Increase knowledge of population trends and conservation needs**
   - Collect and share data on bumble bee presence,
   - Conduct bumble bee surveys using Service-approved protocols, or
   - Fund or conduct research that informs bumble bee conservation.

5) **Encourage advanced conservation commitments**
   - Implement BMPs to limit the spread of invasive species,
   - Control invasive species for conservation purposes,
   - Create new bumble bee habitat areas,
   - Enrolled in complementary certification programs that amplify conservation,
   - Maintain a bumble bee conservation program for staff and contractors, or
   - Map high-quality habitat areas.

The Agreement provides commitment expectations and examples for each of the identified conservation measures. However, Partners are encouraged to develop specific measures to account for local conditions, management capabilities, and constraints.

1.5.1 Minimum Extent Expectations

For specific conservation measures outlined above, Partners must adhere to implementation on a minimum percentage of Enrolled Lands annually to ensure that a net conservation benefit is being met. These minimum extent expectations were informed by minimum contribution levels reported in the Agreement individual Partners, as well as input elicited by industry representatives involved in development of the Agreement.

Specifically, Partners must annually commit 5% of their enrolled lands as suitable habitat set-asides. This measure is mandatory for all Partners. Lands identified as suitable habitat set-asides may change from year to year. This requirement recognizes Partner commitments to avoid disturbance in lands that may otherwise have potential for disturbance. Partners may exceed this minimum extent expectation for habitat set-asides.

Additionally, under Objectives 2-5, Partners must commit to implementing "active" conservation measures on a minimum of three percent of their enrolled lands. "Active" conservation measures refer to vegetation management practices or additional population or habitat monitoring (beyond what is required

by enrolled Partners) that are typically conducted on an annual basis on enrolled lands identified under these objectives. Locations managed with active conservation may change year-to-year. Partners may choose which individual or combination of conservation measures are used to meet this required minimum extent.

1.5.2 Adaptive Management

The Agreement identifies triggers or thresholds that could prompt one or more of the parties to adjust ensure the integrity of the Agreement. The Program Administrator will provide resources through the Agreement toolbox and website and will otherwise provide technical assistance to ensure that Partners have the best available information when making management adjustments. When adaptive management thresholds are triggered, the Program Administrator, Partners, and/or Advisory Committee will review the trigger, initial corrective action or management adjustment, and the anticipated response expected under the individual scenario to determine next steps. A summary of any changes will be included in the Partner's annual compliance reporting documents to the Program Administrator.

1.5.3 Compliance Tracking and Reporting

The Partners will be responsible for annual compliance tracking and annual reporting specified in the Agreement related to its implementation and fulfillment of its provisions, including implementation of agreed-upon conservation measures, in accordance with the executed CI. Compliance tracking will require information on which conservation measures the Partners implemented, as well as when and where they implemented them. Table 14-1 and Table 14-2 in the Agreement summarizes the data that the Partners will be expected to collect.

1.5.4 Monitoring

The Partners will carry out monitoring to document whether conservation measures are effectively creating, enhancing, restoring, or sustaining habitat that supports covered species nesting, foraging and overwintering requirements to ensure a net conservation benefit is achieved.

1.6 COVERED ACTIVITIES

The term "covered activities" refers to those activities carried out on enrolled energy and transportation lands that may result in incidental take of covered species, consistent with the Agreement and EOS Permit during the term of the CI. By committing upfront to the conservation measures, the Agreement will provide energy and transportation land managers certainty that current maintenance and modernization practices, covered within the Agreement – the covered activities, can continue for the endangered covered species and can continue in the event that the Service lists at-risk covered species as threatened or endangered.

The Agreement defines covered activities as follows:

> *Energy and transportation land management, maintenance, and modernization activities on enrolled lands that are reasonably certain to result in take of the covered species. Covered activities cannot result in incidental take of other ESA listed animals or must be conducted in compliance with the terms and conditions of existing incidental take statements (Section 7) or*

Section 10 permits. Partners will develop and implement avoidance and minimization measures to ensure that covered activities do not jeopardize listed or proposed plants or destroy or adversely modify designated or proposed critical habitat. All covered activities are conducted in accordance with existing permits, easements, and agreements that allow the Partners to access and manage their enrolled lands. Covered activities do not include actions that pose significant environmental, socioeconomic, historic, or cultural impacts. If a covered species is listed as endangered or threatened under the ESA, incidental take of the listed species that occurs as a result of covered activities carried out by a Partner who is adhering to the terms of the CI will be authorized under the EOS Permit and Consultation document (biological opinion).

Covered activities are described in Section 5 of the Agreement and include activities which:

- Are associated with the general operations, maintenance (including vegetation management), and modernization of infrastructure on enrolled lands,
- Occur in areas of suitable bumble bee habitat.
- Occur at times and locations where take is likely to occur due, in part, to the likely presence of one or more of the specified species (e.g., within mapped High-Potential Zones for listed species) by removing or disturbing foraging, nesting, or overwintering habitat or direct take of eggs, larvae, or adult bumble bees,
- Are conducted in compliance with the Agreement and CI, plus all applicable Federal, state, and local statues and regulations.

1.7 CHANGES TO ENROLLED LANDS

After the CI's effective date, Partners and UIC will update the Partner's description of lands to reflect approved additions to Enrolled Lands and any removal of Enrolled Lands resulting from transfer of ownership, voluntary removal by the Partner or termination of enrollment due to noncompliance as provided in the Agreement. UIC and the Service will ensure Enrolled Lands are within the context and limits of the programmatic consultation and that net conservation benefit is still being met. The Programmatic Administrator will include a cumulative summary of changes to Enrolled Lands during annual reporting to the Service.

1.8 MONITORING

1.8.1 Suitable Habitat Criteria

Monitoring is expected annually both on a Partner-level and on a program-level. On the Partner-level, monitoring informs whether suitable habitat exists where Partners have applied conservation measures across a wide and diverse network of enrolled lands. The Program Administrator annually compiles and analyzes these data to ensure the Agreement is providing the habitat quality and abundance necessary to achieve a net conservation benefit.

At the program level, the cumulative results of monitoring (i.e., as reported by Partners as a whole) must demonstrate the implemented conservation measures are providing the foraging, nesting, and

overwintering resources necessary for the covered species. The Program Administrator will compile a summary of the Partner-level monitoring conducted and its findings regarding Partner observations of at minimum, the percent cover of flowering nectar plants, the number of nectar plant species, and the presence of nesting or overwintering habitat resources. The Program Administrator may also analyze optionally collected habitat data including invasive species presence, adjacent land uses, habitat threats, and conservation opportunities.

At the Partner level, results of monitoring provide insight on how a Partner's enrolled lands are contributing to the success of the Agreement as a whole and allows Partners to evaluate habitat response to conservation measures. Monitoring by each Partner is intended to answer the following questions:

Do the enrolled lands support the foraging, nesting, and overwintering habitat needs of covered species?

Are the conservation measures sustaining, creating, or enhancing habitat resources on enrolled lands?

For the first question, monitoring results that verify the presence of habitat features such as abundant and diverse flowering plants or plant communities, plus physical habitat structure needed for nesting and overwintering, help confirm that enrolled lands are supporting the intended conservation goals. For the second question, conducting monitoring on lands where conservation measures are, or have been previously applied, verifies that those actions are being conducted in a manner that helps sustain and improve habitat resources.

Partners who choose to engage in third party supported research initiatives (as a conservation measure) may substitute traditional monitoring with the implementation or funding of advanced research programs that collect, analyze, and communicate data relating to bumble bee individuals, populations, ecology, biology, or conservation.

In addition to the suitable habitat criteria, the Agreement includes several adaptive management triggers that are intended to further support the goal of providing a net conservation benefit to the covered species. Adaptive management strategies for the various triggers are outlined in Table 10-1 of the Agreement, which outlines the following triggering scenarios:

1. Conservation emergencies,
2. Changes in listing status of covered or similar species,
3. New and emerging science about the biology, ecology, and conservation of covered or similar species,
4. New and emerging science about conservation measures or monitoring methods,
5. Changes in technology, and
6. Changes to financial stability of the program administration endowment.

1.8.2 Monitoring Methods

1.8.2.1 *Extent of Sampling*

The extent of sampling will depend on the extent of the Enrolled Lands for each Partner (Table 2). See Section 14.2 of the Agreement. Partners will be responsible for determining the exact methods and monitoring implementation that best suit their organizational capacity. Sampling conducted as part of Monarch CCAA participation (when collecting the data required by the Agreement) fulfills the requirements of the Agreement's protocol. The frequency of sampling (i.e., the minimum number of sample plots required for compliance) corresponds to the extent of the enrolled lands, which is specific to each Partner. Sampling is intended to characterize areas where conservation measures are applied, facilitate adaptive management actions where they are needed, and to be readily accomplished by ROW managers.

Table 2. Sampling plots required for biological effectiveness monitoring based on the acreage of Enrollment Lands.

Enrolled Lands (acres)	***Annual Required Monitoring (plots)***
< 5,000	10
5,001 to 25,000	30
25,001 to 100,000	50
100,001 to 300,000	70
300,001 to 600,000	100
> 600,001	100 plus one additional plot for each 5,000 acres exceeding 600,001 enrolled acres.

Considering enrolled lands may overlap with those enrolled in the Monarch CCAA, monitoring frequency was established to generally align with participation in both Agreements. Specifically:

- If a Partner is enrolled in the Monarch CCAA alongside the Agreement and enrolled lands in the Agreement overlap with adopted acres in the Monarch CCAA, they may base monitoring extent on the sampling frequency required by the Monarch CCAA (See Table 14-4 in the Monarch CCAA).
- Partners enrolled solely in the Agreement are required to base annual monitoring extent on their total enrolled lands (Table 2)

1.8.2.2 *Monitoring Reporting Frequency*

Monitoring reporting will be solicited at the end of the first year of implementation, and annually thereafter. If a Partner's initial enrollment occurred late in the calendar year, with little or no time for implementation or monitoring during the growing season, monitoring would not be required until the following year. In such instances, the Partner should confirm expectations with the Program Administrator. Alternatively, less frequent reporting on monitoring may also be permitted if a) the Partner conducts the same number of sites as expected annually to account for longer monitoring duration, and b)

the Partner is currently fulfilling their obligations of the Agreement. Frequencies for reporting other than annually must be specified in the CI application. Partners may choose to report monitoring results more frequently, if desired.

The Program Administrator and the Service reserve the ability to request more frequent reporting if deadlines are missed, reporting is incomplete, or other obligations have not been successfully met.

1.9 NEIGHBORING LANDOWNER AGREEMENT

The Agreement includes an optional neighboring landowner agreement (NLA) for adjacent or underlying landowners the goal of NLA is to minimize concerns and thereby encourage sustaining habitat for the covered species. Non-federal landowners can choose to enroll under the NLA which requires landowners to enter into an agreement with the Program Administrator. The NLA includes a baseline assessment, landowners consent to give permission with reasonable notice for the Service, Program Administrator, or their representatives to enter the property to capture, relocate, salvage, or implement conservation measures to reduce anticipated take of covered species. Neighboring landowners must be non-federal, have federally listed covered species likely to occur on their property, and own lands on or adjacent (within 200 m) to currently enrolled lands under this Agreement. See Section 5.5 of the Agreement. In this Opinion, we do not know the extent of NLA that will occur once the EOS permit is issued; therefore we include the NLA acreage within the total Agreement acreage analyzed in this Opinion to ensure that any take that may occur on these neighboring lands through the NLA on-going activities would be covered. The Program Administrator will provide data annually regarding the acreage of NLA and we will reinitiate this Opinion as needed.

2 STATUS OF THE COVERED SPECIES

See also the description of the covered species' status in the action area in the Environmental Baseline section below (see section 3.4, STATUS OF THE SPECIES IN THE ACTION AREA).

2.1 DISTRIBUTION

The combined range of the eleven listed or at-risk bumble bees included as covered species in the Agreement covers the entirety of the contiguous U.S. Individually, each of the covered species has a unique extant range. Figure 1 shows the estimated ranges of the covered bumble bee species in the contiguous U.S., which is the Action Area for this Agreement. Ranges have been estimated using current and historical data from *Bumble Bees of North America: An Identification Guide* (Williams et al. 2014) and the Xerces Society for Invertebrate Conservation.

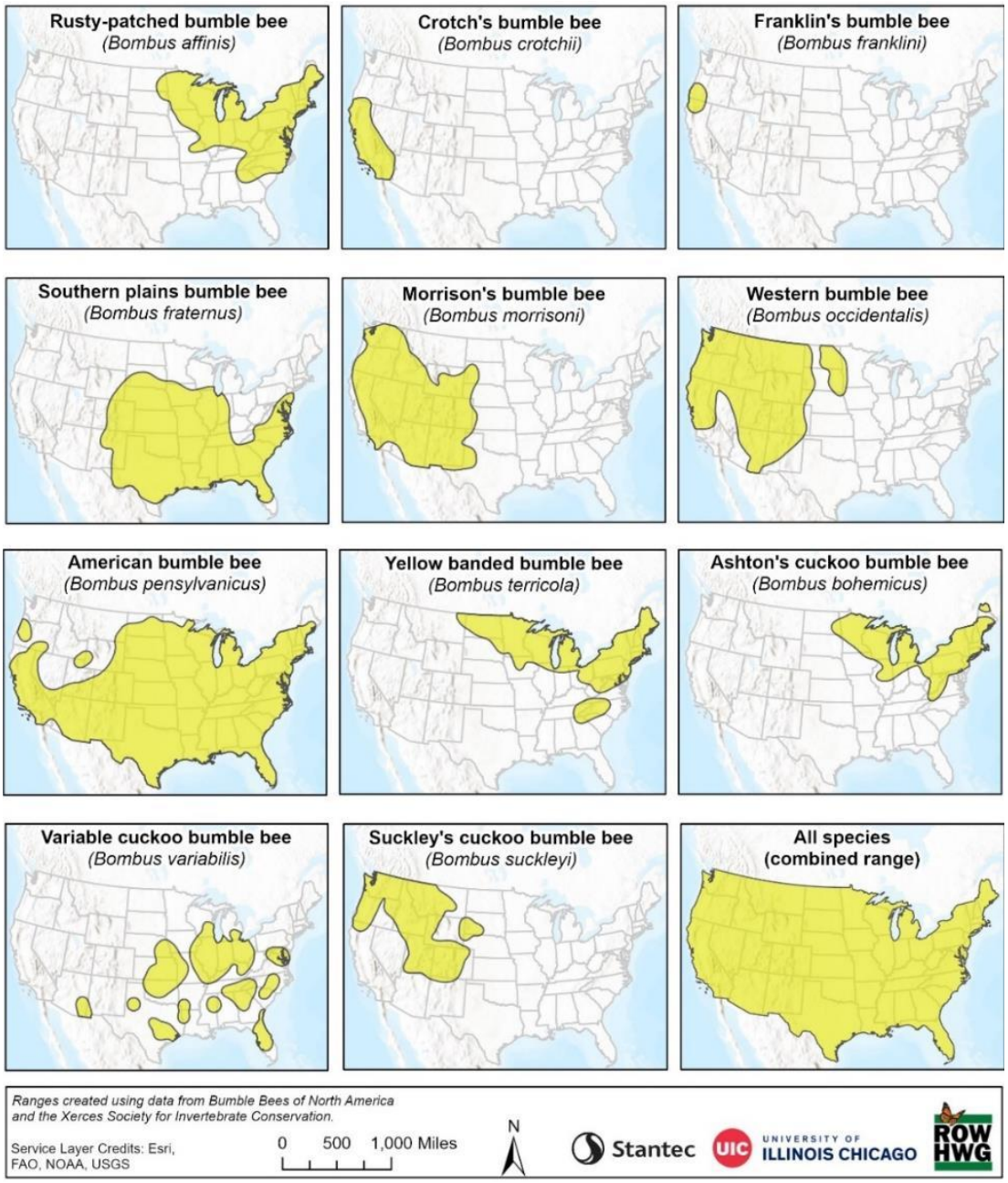

Figure 1. Estimated ranges of the eleven bumble bees includes as covered species in the Agreement. The bottom right map shows a combined range map for all covered species. Ranges are based on current and historic observations.

2.2 FACTORS INFLUENCING THE STATUS OF THE SPECIES

There are multiple factors influencing the status of the covered species; some of which can be directly managed through specific actions of Partners enrolling in the Agreement. These management threats have been identified and aligned in discrete conservation objectives which are used within the Agreement to guide the implementation of conservation measures and delivery of the net conservation benefit. They include threats to nesting and overwintering habitat, threats to foraging habitat, exposure to stressors and direct impacts, and lack of knowledge and understanding. In addition, there are other factors influencing the status of the covered species that are outside the control of Partners to the Agreement. These additional factors are included in the assessment of threats facing the covered species but are not included in discussion of the environmental baseline or effects of the action(s). These factors include the influence of climate change(s) and small population size on the status of the covered species.

The factors influencing the status of the covered species described in the following Sections are informed by scientific literature and resources based on the covered species or similarly related species, as appropriate and available. At the time of this writing, substantial gaps in understanding exist for many of the covered species, and as such, the Agreement and this Opinion rely on the assumptions that bumble bees broadly have similar ecological requirements and face similar threats.

2.2.1 Loss of Nesting and Overwintering Habitat

Nesting and overwintering habitat encompass two of the three distinct habitat resources the covered species are reliant upon. Specifically, nesting habitat refers to areas used by the covered species to establish colonies and rear their young. Queens are thought to opportunistically locate suitable locations for nests after emerging from overwintering. Suitable locations for nests are understudied and challenging to locate but are thought to encompass many different potential settings including animal made cavities (abandoned rodent and bird nests), vegetative cavities (coarse woody debris, grass tufts, thatch, tree roots), and human-made cavities (rock piles, building foundations) (as summarized by Lanternman et al. 2019). Due to this assumed variety, it is thought that bumble bee nesting habitat can occur in multiple different landscape contexts including grasslands, forested lands, and developed lands (as analyzed by Liczner and Colla 2019). Cuckoo bumble bees are thought to rely solely on the nesting preferences of their host species.

Overwintering habitat refers to areas used by the covered species to hibernate during winter months prior to emerging in the spring and formation of a new colony. Fertilized queens are thought to opportunistically select suitable cavities in which they can hibernate. Much like nesting habitat, the suitability of varied overwintering sites and species preferences are understudied. Limited data suggests that bumble bees may preferentially select overwintering sites in soft, exposed substrates occurring under or near trees, along exposed banks, or in and near existing animal cavities (Alford 1969; Liczner and Colla 2019). Overwintering habitat can likely occur in multiple different landscape contexts including grasslands, forested lands, and developed lands (as analyzed by Liczner and Colla 2019).

Little is known about preferences, habits, deterrents, and specific threats to nesting and overwintering habitats of bumble bees. Less still may be known about the specific nesting and overwintering habitats of the covered species. A single documented overwintering rusty patched bumble bee queen was discovered in a maple-oak woodland under a few centimeters of leaf litter and loose soil (B. Herrick, personal communication, 2016, Herrick and Carpenter 2025). Other bumble bee species (not covered species in the

Agreement) have been observed and reported, including ten yellow-faced bumble bees (*B. vosnesenskii*) queens overwintering in needle litter (Williams et al., 2019) and a single common eastern bumble bee (*B. impatiens*) overwintering beneath sod in loose soils (Plath 1927). Assumptions made regarding the covered species and their specific needs and the threats they face are based on the limited data that does exist for similar and closely related species.

Despite the lack of an in-depth understanding related to nesting and overwintering of the covered species, it is hypothesized that land conversion from natural systems to urban, suburban, industrial, and agricultural lands, and the ensuing increase in disturbance frequency, has a negative effect of the availability and suitable of lands that may be used for nesting and overwintering of the covered species (Winfree et al. 2009). Additionally, these disturbances may also have a direct impact on existing nest, as disturbance may lead to mortality of colonies or single overwintering queens.

2.2.2 Loss of Foraging Habitat

Foraging habitat refers to areas used by the covered species to collect pollen and nectar from flowering plants (resources) To be considered foraging habitat, flowering plants must be present. Foraging habitat may occur in many different landscape contexts and can vary widely. Often, high quality foraging habitat can be found in grasslands (prairies, old fields, meadows), forested lands (forests, shrublands, savannas), and the transition zones between them. Foraging habitat may also be present in developed landscapes with established parks or gardens. The quality of foraging habitat can be judged by three criteria: abundance, constancy, and diversity of floral resources. Abundance refers to the absolute quantity of flowering resources present. Constancy refers to the presence of floral resources throughout the year (or active season). Diversity refers to the number of distinct flowering species present. Each of these criteria measure qualities of foraging habitat which support different stages of bumble bee life histories.

Bumble bees need access to nectar and pollen throughout their active season to support all stages of colony development. Nectar is a source of both carbohydrates and water, whereas pollen is the main source of proteins and lipids (USFWS 2016; Vaudo et al. 2023). Bumble bees rely on some plant species for pollen and others for nectar, even during single foraging bouts (Plowright and Laverty 1984). Availability of pollen may limit population growth more than availability of nectar (Colla 2016; Plowright and Laverty 1984) and the number of queens that a colony can produce is related directly to pollen availability (Burns 2004). Further, evidence suggest that the production of sexual offspring (new queens and males) may be limited in landscapes with a low availability of high-quality pollen sources, even if nectar carbohydrates are abundant (Requier et al. 2020). Constancy, or the availability of floral resources throughout the active season is also critically important for the covered species. For example, woodland spring ephemerals are likely important resources for queens emerging from overwintering (Colla and Dumesh 2010; Requier et al. 2020) and late-season flower abundance and diversity is thought to maximize queen production in the following year (Bukovinszky et al. 2017).

Similar to nesting and overwintering habitat, foraging habitat faces threats from impacts from ongoing or expanding human activities that lead to the decrease in abundance, quality, and connectivity of these crucial habitats. The transition of once common grassland and forested landscapes to other land uses is thought to have led to widespread decreases in abundant and diverse floral food resources necessary to support adequate foraging habitat for the covered species (Goulson et al. 2015; Sánchez-Bayo and Wyckhuys 2019). Remaining suitable habitat is often fragmented from other continuous habitat areas,

making it challenging or impossible for bumble bee species to locate (Goulson et al. 2008; Williams and Osborne 2009). Declines in foraging habitat and floral resource availability may have nutritional consequences for bumble bee species that make them less fit in the face of multiple stressors (Goulson et al. 2015). Overall, loss and degradation of foraging habitat have been shown to lead to a reduction in bumble bee diversity and abundance (Potts et al. 2010), although these declines may be variable across species.

2.2.3 Exposure to Stressors and Direct Impacts

The covered species are also exposed to a variety of direct and indirect stressors that have been shown or are hypothesized to contribute to their declines in recent decades. Stressors and direct impacts may include direct disturbance related injury or mortality from human activities, increased exposure to pesticides and other toxins, and competition with and exposure to pathogens and parasites from commercially managed bee species.

Certain human activities may directly impact the covered bumble bee species and result in injury or mortality. These activities are often associated with other changes such as reduction or degradation of habitat but are distinct in that the activity is directly causing harm. Examples of these directly impactful activities may include collisions with vehicles (cars and trucks) or other equipment (mowers, plows) (Goulson et al. 2015). While it is unknown the extent to which these direct interactions may be contributing to decline of the covered species, there are actions that can be taken to minimize their impact.

Pesticide exposure can occur throughout the life span of a bumble bee, from larval development to adulthood (Sanchez-Bayo and Goka 2014; Goulson et al. 2015), and can include exposure to fungicides, herbicides, insecticides, and rodenticides (USFWS 2016). Pesticides are widely used in agricultural, urban, and natural environments and bumble bees may be exposed through contaminated nectar and pollen, or direct absorption (USFWS 2016). Insecticides and herbicides are thought to have the most significant effects on bumble bees. The former are designed to directly kill insects while the latter are designed to kill plants. As such, these pesticides may have direct impacts on the covered species themselves or on the floral resources they require (Moffett and Morton 1975; USFWS 2016; USFWS 2018). More specifically, consumption of nectar or pollen contaminated with toxic pesticides may lead to decreased reproductive fitness, decreased foraging efficiency, increased susceptibility to pathogens and parasites, and overall increased mortality of the covered species (Feltham et al. 2014; Larson et. al 2013, USFWS 2016). Insecticides in particular have been shown to have lethal or sublethal effects on bumble bees in all life stages. Particular insecticides that are known to be detrimental to bumble bees include (but are not limited to): acetamiprid, buprofezin, clothianidin, clyhalothrin, cyromazine, deltamethrin, diflubenzuron, flucycloxuron, flufenoxuron, imidacloprid, lufenuron, novaluron, spinosad, teflubenzuron, thiacloprid, and thiamethoxam (USFWS 2016; Elston et al. 2013; Gill et al. 2012; Mommaerts et al. 2006; Sanchez-Bayo and Goka 2014; Scott-Dupree et al. 2009).

Exposure to honeybees and commercial bumble bees (or other managed bees) may lead to the transmission of pathogens and parasites to native bumble bees including the covered species in the Agreement. Specifically, exposure to pathogens and parasites through these vectors is thought to occur through collection and consumption of pollen grains carrying these agents. Exposure to these infectious agents may lead to queen sterility or reduced fecundity, physical deformations, reductions in crucial fat

stores, and increased mortality of larvae and overwintering queens (USFWS 2016). Additionally, the presence of commercial or managed bees, especially in areas to which they are not native, may increase competition for already limited resources such as nectar and pollen. This increased competition may negatively impact nutritional health of the native bumble bees, thus leading to reduced reproductive success and/or increased susceptibility to pathogenic agents (USFWS 2018; Brown et al. 2000).

2.2.4 Lack of Knowledge and Understanding

One of the most pressing threats to the covered species is the lack of knowledge and understanding that currently exists regarding their biology, ecology, and specific conservation needs. As mentioned, significant gaps in the current literature and scientific understanding of these species exist. Even for those species that are relatively well studied, such as the rusty patched bumble bee, significant gaps persist including a robust understanding of the species' nesting and overwintering preferences and requirements (demonstrated by a sole reported observation of this species overwintering, in 2016). As a result of this significant knowledge gap, there are many unknowns and assumptions made in the delivery of conservation for these species.

2.2.5 Climate Change

Global climate change has been identified as a threat to bumble bees, although specific impacts are not well understood, as most studies on the impacts to insect pollinators have focused on butterflies as model species (USFWS 2016; USFWS 2018). Effects from climate change that are thought to have the greatest impact on bumble bees include increases in drought, flooding, storm events, and temperature, early snow melt, later frosts, and overall greater climatic variability (USFWS 2016). These factors may lead to decreased resource availability (due to mismatches in temporal and spatial co-occurrences) and increased pressures from pathogens and non-native species, among other impacts (USFWS 2018; Goulson et al. 2015; Kerr et al. 2015; Potts et al. 2010; Cameron et al. 2011; Williams and Osborne 2009).

Climate change has been suggested to lead to range shifts for butterflies (USFWS 2018; Foristera et al. 2010; Hickling et al. 2006) as well as spatial mismatches among plants and their insect pollinators (USFWS 2018; Memmott et al. 2007). The impacts of spatial mismatches between bumble bees and their preferred or required floral resources vary by species, region, landscape location, and pre-existing prevalence of floral resources. Bumble bees may also be threatened by temporal mismatches given their dependence on floral resources throughout their extended active season (USFWS 2018). Temporal asynchrony could lead to declines in resource availability during periods of critical individual and colony development such as spring, when bumble bee queens first emerge to establish nests (USFWS 2018) or fall, when new queens are maintaining and looking for a location in which they may overwinter.

Climate change may also lead to direct impacts on bumble bees causing injury or mortality. Specifically, increased flooding or more extreme storm events have the potential to cause increased inundation of nesting and overwintering habitats, which often are opportunistically located in abandoned rodent burrows or other ground cavities (USFWS 2018; Goulson et al. 2015). Additionally, climate change may have impacts to the resident ground nesting rodent species of an area, which may indirectly lead to a reduction of nesting and overwintering habitat resources, although this has not been explicitly tested. Further, more frequent or extreme temperature highs may impact bumble bees, as they are thought to be poorly adapted to high temperatures (USFWS 2018).

2.2.6 Small Population Dynamics

The population biology and genetics of bumble bees is highly influenced by their social organization (USFWS 2016; Pamilo et al. 1997; Chapman and Bourke 2001; Zayed 2009). Bumble bees exhibit a haplodiploidy sex determination system, where unfertilized (haploid) eggs become males that carry a single set of chromosomes and fertilized (diploid) eggs become females that carry two sets of chromosomes (USFWS 2018). Occasionally, when queens share a sex-determining allele with a haploid male mate, diploid males can be produced, creating additional unproductive colony members with limited mating potential (Zayed 2009, as cited in USFWS 2016). Diploid male production causes smaller population sizes and decreased population growth. In turn, declining populations are expected to produce higher frequencies of diploid males because of the overall reduced number of reproductive individuals and female-limited genes likely constitute a significant source of inbreeding depression (USFWS 2016). Because of this, bumble bees face challenges in maintaining genetic diversity and ability to adapt to environmental changes, especially in small populations. The unique genetic and social characteristics of bumble bees make them highly susceptible to the detrimental effects of small population sizes and isolated habitats. Inbreeding in small populations causes a loss of genetic variability through genetic drift, which results in a reduction in individual bumble bee fitness and ability of bumble bee populations to adapt to changing environments (USFWS 2016). Bumble bees are highly vulnerable to habitat change or loss, parasites, diseases, and stochastic events like droughts, floods, and fires due to their small population dynamics and subsequent low genetic diversity, which may lead to extinction (USFWS 2018).

3 ENVIRONMENTAL BASELINE

Effects of the action refers to the direct and indirect effects of an action on the species or critical habitat, together with the effects of other activities that are interrelated or interdependent with that action, that will be added to the environmental baseline. The environmental baseline includes the past and present impacts of all Federal, State, or private actions and other human activities in the action area, the anticipated impacts of all proposed Federal projects in the action area that have already undergone formal or early section 7 consultation, and the impact of State or private actions which are contemporaneous with the consultation in process. Indirect effects are those that are caused by the proposed action and are later in time, but still are reasonably certain to occur. Interrelated actions are those that are part of a larger action and depend on the larger action for their justification. Interdependent actions are those that have no independent utility apart from the action under consideration**.** 50 CFR 402.02 (2018).

3.1 ACTION AREA

The implementing regulations for section 7(a)(2) of the Act define the "action area" as all areas to be affected directly or indirectly by the Federal action and not merely the immediate area involved in the action. [50 CFR §402.02]. Enrolled lands may include all or some combination of suitable habitat types, or areas with the potential to create those habitats.

See the section 1.3 *Covered Lands*, above, for additional description of the action area, where the covered species are likely to occur, this includes each covered species' range which when combined equate to the contiguous U.S. (Figure 1).

3.2 COVERED LANDS DESCRIPTION

This section is largely adapted from section 4.7 of the Agreement – Description of Lands Covered.

Lands that may be eligible for enrollment under the Agreement – transportation and utility rights-of-way and associated lands – are ubiquitous across the North American landscape, crisscrossing mountains, forests, grasslands, deserts, farms, parks, and cities. Though often overlooked as terrestrial habitat, energy and utility rights-of-way comprise about 12 million acres of land in North America (Peterson et al. 2015 as cited by the Midwest Association of Fish and Wildlife Agencies (MAFWA) 2018a), and transportation rights-of-way, including those along roads and railroads, represent even greater acreage of habitat. State Departments of Transportation (DOT) managed roadsides alone consist of over 17 million acres of land in the U.S. (Hopwood et al. 2015). Other development related to transportation of information and data, including broadband and fiber corridors and data centers, are greatly expanding throughout the country. These facilities may be co-located on other energy or transportation lands and may require similar vegetation management practices. Not excluding areas of overlap, these energy and transportation lands comprise nearly 35 million acres. Based on the enrollment of Partners from both the energy and transportation sectors in the Monarch CCAA, we are assuming that there will be a fairly even split with slightly higher enrollment in the transportation sector. We are using what we consider a High Enrollment scenario with 13,000,000 acres initially enrolled in the energy sector and 15,000,000 acres enrolled in the transportation sector (Table 3). This acreage also includes any neighboring landowners that may submit and enter into a Neighboring Landowner Agreement (NLA) with the Program Administrator. See 5.5 of the Agreement for more details of the requirements to enter in this role. We do not know the extent of neighboring landowners who will seek coverage under this agreement for their existing on-going activities but reports of the total acreage of NLAs per sector will be provided to the Service from the Program Administrator annually.

Vegetation in most of the energy and transportation lands is generally managed to prevent the growth of trees and other large woody vegetation. This maintains a perpetual state of early successional habitat – grassland, meadow, shrubby areas, etc. (Lanham & Whitehead 2011).

Table 3. Anticipated acreage of enrollment under the Agreement by either Energy Sector or Transportation Sector. Along with the annual minimum amount of conservation measure implementation required, and the required habitat set-asides on enrolled lands for each Partner. Note that combined sector enrollments will be split between both sectors for the Opinion's analysis.

	Maximum Estimated Acreage Enrolled	Minimum Required Conservation Measures	Minimum Required Habitat Set-Asides	Implementation Rates[1]

[1] These rates are the minimum required for Enrolled Partners that includes conservation measures and habitat set-aside for Enrolled Lands under the Agreement.

Energy Sector[2]	13,000,000	3.0%	5.0%	8.0%
Transportation Sector[3]	15,000,000	3.0%	5.0%	8.0%

3.3 ACTIVITIES IN THE ACTION AREA

Safety concerns and regulations and competing vegetation management objectives in any particular location limit the current and future extent of covered species habitat in the action area. In addition to linear rights-of-way, energy and transportation lands also include individual parcels that may contain infrastructure associated with rights-of-way operations. Energy sector lands may include parcels for generation sites, substations, pump stations, operation centers, or other office or storage facilities. Transportation lands may include parcels dedicated to facilities such as rest areas, local storage and maintenance, and regional operations and management. Partners obtain and maintain parcels in preparation of future project needs, many of which contain lands that they can manage in a similar manner to rights-of-ways to sustain suitable habitat for covered species.

3.3.1 Energy Sector - Transmission Power Line Rights-of-Way

Transmission powerline rights-of-way form a network of varying widths in the action area – from about 75 feet to 200 feet total right-of-way width. Transmission lines may be on fee-simple owned lands but typically are on lands where companies have obtained management rights through easements. They generally require implementation of rights-of-way best management practices designed to ensure that the structures and wires are kept clear of other structures and vegetation that may interfere with electric reliability. Landowners who grant easements may continue to manage the property at their discretion according to the easement document. The easement document can constrain restoration and maintenance of rights-of-way vegetation if it does not align with the landowner's interest.

3.3.2 Energy Sector - Substation Parcels

Substation parcels are typically installed on crushed rock pads on which vegetation growth is typically managed to little or no growth. They are managed typically on annual maintenance schedules that include the application of a sterilant herbicide to prevent vegetation growth throughout the station. Stations may be located on property that is larger than is required for the station. These parcels may provide open space buffer zones outside of the fenced-in station that may potentially be enhanced or planted into pollinator habitat. Local municipalities may require screening vegetation via either ordinances or construction permits, but there may be opportunities to coordinate with municipalities to restore to pollinator habitat.

[2] Energy sector includes energy generation, transmission, and distribution lands through the Agreement Area (Action Area).

[3] The transportation sector includes Interstate highways, U.S. highways, state highways, county highways, county and local roads, and railways throughout the Agreement Area (Action Area).

3.3.3 Energy Sector - Electric Generation Sites

Generation sites consist of powerplants. Some lands maintained for current or future generation needs include land previously mined for coal and recreation areas. Companies may purchase lands around their facilities as buffer lands or for future projects. Lands adopted to support renewable energy sources are also becoming important for habitat management. Many electric generation sites are managed free of vegetation where operations are conducted. Areas surrounding solar panel arrays, for example, are often maintained with gravel or in low-growing vegetation, including mowed lawn.

Some energy generation facilities may be sited entirely on easements with private landowners. These easements extend for the life of the generation facility – typically 20 to 30 years – and require the removal of all facilities at the end of the easement life. Depending on the terms of these arrangements, company management of property surrounding the turbines or solar arrays may or may not be allowed. Where vegetation management rights are outside of the Partner's control, those lands may not be appropriate to enroll in the Agreement.

3.3.4 Energy Sector - Oil and Gas Rights-of-Way

Oil and gas rights-of-way commonly have a defined width according to diameter and pressure of the pipeline. A right-of-way easement allows the utility company to keep the easement clear of any trees or other structures that may interfere with the ability to operate the pipeline and to maintain its integrity; perform essential maintenance; or place additional lines in the rights-of-way. Pipelines and their rights-of-way exist throughout the country in both urban and rural areas. Similar to electric rights-of-way, pipelines may be located or co-located within road rights-of-way or on private land in an easement owned exclusively by the utility. Similar to electric utilities, the oil and gas rights-of-ways are comprised of larger (intrastate, interstate and interregional) transmission routes that transport high volumes to smaller distribution networks of smaller pipelines that ultimately end at homes, businesses, and other customers.

The width of a pipeline rights-of-way depends on the diameter and pressure of the line and the number of lines in a right-of-way. Rights-of-way for smaller distribution lines can range from 5 to 25 feet wide while typical transmission lines usually consist of 50-foot permanent rights-of-way. Often a temporary construction easement adjacent to a permanent 50-foot easement is used during the construction of the pipeline and may vary from 25 to 100 feet wide. When construction is complete, this temporary construction easement is voided, returned to the landowner, and restored to its preconstruction condition.

3.3.5 Transportation Sector - Transportation Rights-of-Way

Transportation networks consist of the interstates, highways, local roads, and railroads used daily for commuter transportation, as well as the movement of goods and services. As reflected by the previous discussion of energy lands, transportation rights-of-way and their associated lands are comprised of fee-simple owned lands, easements, and other access agreements across road and rail networks of various sizes.

Management and maintenance of these transportation networks are focused on the efficient movement of traffic with safety their primary focus. For this reason, roadsides (and to a similar extent rail) is managed with consideration for several zones (Figure 2). Each state and local road authority may maintain these areas differently based on local laws and regulations.

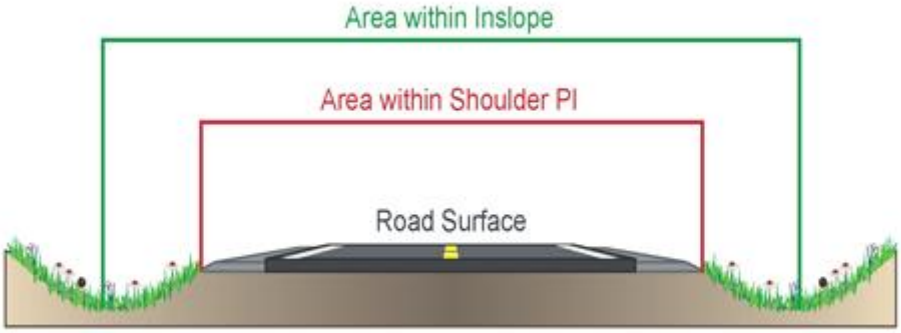

Figure 2. Operational Rights-of-Way Zones Used for Initial Categorization of Activities.

The transportation corridors also vary in their width and management control depending on their context. Corridors located in suburban and rural landscapes typically contain more diverse land cover and greater conservation opportunity under the Agreement. By comparison, adjacent land uses may limit the ability to maintain or restore covered species habitat in urban landscapes. Frequently managed cleared areas (clear zones) adjacent to pavement provide for the safety of the motoring public. Adjusting mowing standards with strategic and rotational mowing, or delayed roadside mowing could provide habitat opportunities for covered species. Areas outside of routine management or excess rights-of-way parcels provide a significant opportunity for additional habitat.

3.3.6 Transportation Sector - Access-controlled Roadways (Interstates and Tollways)

Routinely mowed areas range from 15 to 30-feet wide adjacent to pavement and/or gravel shoulders and are routinely mowed to provide for the safety of the motoring public. These areas adjacent to pavement are not generally considered suitable habitat for covered species, but are sometimes left unmaintained and may offer high potential for habitat that extends from the routinely mowed area to the access control fence, including median areas and interchange infields. The area inside the access control limits is generally protected from mowing and disturbances outside of authorized personnel. Due to their protected nature, these areas are considered to be the highest value habitat areas within the highway transportation system when properly managed.

3.3.7 Transportation Sector - Highways (U.S. or State-Marked Routes)

Similar to access-controlled highways, U.S. and state highways also maintain areas of low vegetation or clear zones free from obstructions adjacent to pavement to allow drivers to recover when vehicles leave the pavement. These areas are not generally considered suitable habitat for covered species. Areas outside of the clear zone offer potential habitat that extends from the clear zone to the right-of-way boundary. In states where rural highways are typically not controlled by fencing, those areas are often subject to 'volunteer' mowing by others. If properly signed and maintained, those areas are primarily maintained by the transportation agency, and the potential for viable habitat is more likely.

3.3.8 Transportation Sector - Special Management Areas

Managed areas (signed and protected remnant vegetation, threatened and endangered species areas, waysides, and excess rights-of-way) already exist along rural, non-access controlled highways. These locations may be signed to identify the asset and to prohibit mowing or spraying. These areas are typically mapped and protected by policy within all sectors of transportation agencies.

3.3.9 Transportation Sector - County and Local Roadways

These roads include county, township, or other roads not designated as an interstate, U.S., or state marked route. The right-of-way width varies significantly but is often between 30 to 75-feet in total width, including both pavement and shoulders. These rights-of-way can be managed by a county, municipality (township, village, city), or their contractors.

3.3.10 Transportation Sector - Railroad Rights-of-Way

Vegetation in railroad rights-of-way is typically managed using herbicide treatments of the trackbed base (i.e. ballast) to facilitate required inspections, decrease fire potential, maintain safe walking areas for train inspections, and provide visual clearance for motorists and pedestrians so they can safely view approaching trains.

As noted, energy companies and transportation agencies own and/or manage many different types of land beyond the rights-of-way as well. Similarly, railroad companies often own non-operating properties, which consist of unused portions of railyards, abandoned railroad tracks, or other properties that are not currently in operation, which pose opportune locations for habitat conservation projects where resources are available.

Much like highway rights-of-way, railroad rights-of-way generally consist of an area immediately adjacent to the track where vegetation is routinely managed to control for safety. This area does not present much opportunity for covered species' habitat due to its frequent management interval. The remainder of the rail rights-of-way beyond this area adjacent to the track are managed less frequently and therefore could serve as covered species habitat. Current management includes occasional mowing, brush removal, and/or broadcast herbicide use. Adapting these measures through scheduled vegetation removal, or targeted herbicide treatments could improve and expand covered species habitat.

3.3.11 Transportation Sector - Transportation Parcels

In addition to roadsides, state departments of transportation (DOT) may also maintain large parcels that can benefit -bumble bees. Rest areas, storage and maintenance facilities, and wetland or other mitigation sites all have potential for suitable habitat that can be enhanced to benefit covered species. These areas often provide opportunities for restoring natural vegetation or enhancing natural vegetation to provide habitat. These areas may have large tracts of land with habitat potential where the public can park without the safety concerns of the roadway. Other lands may have conservation potential, but are less visible, such as excess undeveloped land previously purchased for building or future rights-of-way development, picnic areas, and some mitigation sites.

3.4 STATUS OF THE SPECIES IN THE ACTION AREA

3.4.1 Populations and Trends

At the time of development, the Agreement includes eleven at-risk bumble bees (Table 2-1) including three cuckoo bumble bees. For the Agreement, "at-risk" refers to certain species experiencing severe population declines, including species petitioned, proposed, or already listed under the ESA. The Agreement may be amended in the future to add new covered species as described in Section 9 of the Agreement. In that event, Table 4, would be updated to reflect additional covered species.

3.4.1.1 Rusty patched bumble bee *(Bombus affinis)*

Rusty patched bumble bee was historically distributed across the upper Midwest and East Coast of the U.S. However, in recent years, the species has experienced a large decline in population and occupied range that is thought to be a consequence of multiple independent and synergistic threats including fungal pathogens such as *Vairimorpha bombi*, overuse of pesticides, drought, small population genetics, and destruction or conversion of suitable habitat (USFWS 2016, 2021a, and 2023). Of the eleven species initially included in the Agreement, rusty patched bumble bee is by far the best studied and understood, likely due to the attention it has been afforded at the federal level; the Service completed a species status assessment in 2016, listed the species as endangered under the ESA in 2017, and finalized a recovery plan for the species in 2021. At present, the range of rusty patched bumble bee has contracted approximately 70-95% from its historical extent (Hatfield et al. 2014a, USFWS 2016). It has been observed nesting in forest edges and developed areas and is assumed to preferentially overwinter in loose substrates near trees or banks within forested areas, although little empirical data exists (USFWS 2022). There is only one confirmed observation of an overwintering *B. affinis* queen (Herrick and Carpenter 2025) and a handful of recent nesting observations of the species (Boone et al 2021, ESI 2024, Smith et al. 2025) This species also has multiple documented floral associations, although like other bumble bees is considered a generalist forager. Native species it has been observed foraging on include wild bergamot (*Monarda fistulosa*), prairie clover (*Dalea* spp.), hyssop (*Agastache* spp.), goldenrod (*Solidago* spp.), asters (*Symphyotrichum* spp.), leadplant (*Amorpha canescens*), Joe-Pye weed (*Eutrochium* spp.), coneflowers (*Echinacea* spp., *Ratibida* spp.); sunflowers (*Helianthus* spp.), white turtlehead (*Chelone glabra*), native wild blueberries and cranberries (*Vaccinium* spp.; USFWS 2017), mountain mint (*Pycnanthem* spp.), Culver's root (*Veronicastrum* spp.) (Simanonok et al. 2021, 2024, Wolf et al. 2022) , spring ephemeral forest wildflowers (e.g., *Dicentra* sp, *Anenome* spp, *Hydrophyllum* spp.), and late-flowering species of wetlands and wet meadows (e.g., *Eutrochium* spp., *Eupatorium* spp.) (Wolf et al. 2022).

Table 4. At-risk bumble bees included in the Agreement as covered species, their common name, scientific name, Federal listing status, and their estimated population declines.

Common Name	Scientific Name	Federal Listing Status	Estimated Population Declines
Rusty patched bumble bee	*Bombus affinis*	Endangered	70-95% decline[4]
Crotch's bumble bee	*B. crotchii*	Not federally listed	68% average decline in recent estimates[4]
Franklin's bumble bee	*B. franklini*	Endangered	Only one individual found in 2006[4]
Southern plains bumble bee	*B. fraternus*	Petitioned	42% average decline in recent estimates[5]
Morrison's bumble bee	*B. morrisoni*	Petitioned	58% average decline in recent estimates[4]
Western bumble bee	*B. occidentalis*	Petitioned, Under Review	40-57% decline in recent estimates[4]
American bumble bee	*B. pensylvanicus*	Petitioned, Under Review	51% average decline in recent estimates[4]
Yellow banded bumble bee	*B. terricola*	Not federally listed	50% average decline in recent estimates[4]
Ashton's cuckoo bumble bee	*B. bohemicus*	Not federally listed	95% average decline in recent estimates[4]
Variable cuckoo bumble bee	*B. variabilis*	Petitioned, Under Review	One of the rarest North American bumble bees. Nearly a 100% decline in recent estimates[1]
Suckley's cuckoo bumble bee	*B. suckleyi*	Proposed Endangered	90% decline in recent estimates[1]

3.4.1.2 Crotch's bumble bee (*B. crotchii*)

Crotch's bumble bee is a bumble bee species with a limited distribution in the U.S. state of California, where it inhabits grassland and scrublands across multiple ecoregions. This species was once common in the Central Valley region but has experienced significant population and range declines (Williams et al. 2014; Hatfield et al. 2014b). Extensive land conversion to agricultural and urban development, and subsequent loss of habitat within the Central Valley, are considered primary causes of its decline, although other threats are likely important drivers of decline for this species as well. Crotch's bumble bee is currently a Candidate Species for listing under the California State Endangered Species Act. Very little is known about the nesting and overwintering behaviors, locations, and preferences of Crotch's bumble bee (Xerces et al. 2018). This species is considered a generalist forager and commonly associated with

[4] IUCN species assessments published at www.iucnredlist.org

[5] 2022 listing petition (Tyler 2022).

species in the bean (*Fabaceae*), milkweed (*Apocynaceae*), aster (*Asteraceae*), mint (*Lamiaceae*), and forget-me-not (*Boraginacaeae*) families (Xerces et al. 2018).

3.4.1.3 Franklin's bumble bee (*B. franklini*)

Franklin's bumble bee is a species that is thought to have the most limited distribution of all known North American bumble bees and one of the most limited distributions or bumble bees in the world (Williams et al. 1998; Williams et al. 2014). This species is presumed to live in an approximately 13,0000 square mile area of the Klamath Mountain region of southern Oregon and northern California, preferring open meadows in proximity to seeps, however, it has not been observed since 2006 (USFWS 2021b). The Service completed a species status assessment for Franklin's bumble bee in 2018 and subsequently listed the species as endangered under the ESA in 2021. It is thought that Franklin's bumble bee is threatened by similar threats as other bumble bee species including impacts to habitat and exposure to stressors, although driving factors for this species' disappearance remain unclear (USFWS 2021b). Very little is known about the nesting and overwintering behaviors, locations, and preferences of Franklin's bumble bee (USFWS 2021b). It has been associated with a number of flowering plants within its distribution, including wild lupines (*Lupinus* spp.), California poppy (*Eschscholzia californica*), horsemint (*Agastache urticifolia)*, and mountain penny-royal (*Monardella odortissima*).

3.4.1.4 Southern plains bumble bee (*B. fraternus*)

The southern plains bumble bee was once found across the Midwest, Great Plains from Texas to North Dakota, and along the southeastern coastal plain in grasslands, savannas, and open woodlands of 26 U.S. states. Presently, southern plains bumble bee is thought to be extirpated from at least five of those states and has experienced a sharp decline of an estimated 42% of its range in recent decades (Hatfield et al. 2014c; Guzman et al. 2021). Like other bumble bees, the southern plains bumble bee faces multiple and interacting threats including impacts to habitat exposure to stressors, and subsequent and compounding small population size (Center for Biological Diversity 2022). As a result of sharp declines and continued threats, the Center for Biological Diversity petitioned the Service to list the southern plains bumble bee as threatened or endangered under the ESA in 2022, and in 2024 the Service published its 90-day finding that listing this species may be warranted based on the information presented in the petition. Very little is known about the nesting and overwintering behaviors, locations, and preferences of southern plains bumble bee (Center for Biological Diversity 2022). This species has been associated with and suggested to prefer flowers in the aster (Asteraceae), bean (Fabaceae), and mint (Lamiaceae) families, although is assumed to be a generalist like other bumble bees.

3.4.1.5 Morrison's bumble bee (*B. morrisoni*)

Morrison's bumble bee is found in dry open grassland and scrub habitats in the Mountain and Desert West regions, east to New Mexico and Texas, and north to South Dakota (Williams et al. 2014). Similarly, to other bumble bees, this species has experienced a dramatic decline of an estimated 58% compared to historic estimates (Hatfield et al. 2014d, Xerces 2023). In 2023, the Service was petitioned by Xerces Society to list Morrison's bumble bee under the ESA. The Service issued a positive 90-day finding in 2025 (90 FR 7038). Threats to this species appear to be similar to other bumble bees, broadly, but factors contributing to the observed decline is unclear. Only one records of Morrison's bumble bee nesting has been reported (Xerces 2023). Otherwise very little is known about this species' nesting and

overwintering behaviors, locations, and preferences. Morrison's bumble bee has been observed foraging on many species, and in particular has been associated with wild bergamot (*Monarda* ssp.), loosestrifes (*Lythrum* spp.), thisles (*Cirsium* spp.) and willowherbs (*Zauscheneria* spp.; Williams et al 2014).

3.4.1.6 Western bumble bee (*B. occidentalis*)

Western bumble bee is also formerly a common and widespread bumble bee with a historic range that extended throughout western North America. However, in recent decades, western bumble bee has gone from being one of the most common bees in the west to being almost nonexistent in large portions of its historic range. It is estimated that this species has potentially declined up to 93% in recent decades (Cameron et al. 2011; Hatfield et al. 2014e; Graves et al. 2020). Western bumble bee was petitioned by Defenders of Wildlife in 2015 for listing under the ESA, and currently the species is under review by the Service. Threats to western bumble bee include habitat loss, pesticides, disease spillover from commercial bumble bees, and climate change (as summarized in Defenders of Wildlife 2015; Janousek et al. 2023). Very little is known about this species' overwintering behavior and preferences, and nesting colony behavior is presumably similar to that of other species, with preferences towards nesting in litter or abandoned rodent nests (Hobbs 1968). The Western bumble bee is a generalist forager and has been documented visiting a diverse array of different flowering plant species across its range. There has been little study into specific preferences held by this species (as summarized in Defenders of Wildlife 2015).

3.4.1.7 American bumble bee (*B. pensylvanicus*)

Once a common bumble bee across nearly the entire continental U.S., the American bumble bee has declined by approximately 51% according to some estimates (Hatfield et al. 2015). As of 2001, the American bumble bee has become extirpated from at least eight states, mostly in the Northeast, and it is in decline elsewhere (Tyler et al. 2021a). As a result, the Service was petitioned to list this species under the ESA in 2021 by the Center for Biological Diversity. The decline of the American bumble bee is believed to be the result of synergistic impacts of threats including habitat loss, pesticides, disease, climate change, competition, and loss of genetic diversity (as summarized in Tyler et al. 2021a). Very little is known about this species' overwintering and nesting behavior, locations, or preferences, but evidence suggests that this species prefers nesting above ground (Williams et al. 2014; USDA NRCS 2021). Similarly, little is known about this species' preferences for floral resources; it is broadly assumed to be a generalist forager. Their diet consists predominately of plants in the Asteraceae, Fabaceae, and Laminaceae families (Pyke et al. 2012, Wood et al. 2019, Lanternman and Novotny et al. 2023, Miller et al. 2025).

3.4.1.8 Yellow banded bumble bee (*B. terricola)*

The yellow banded bumble bee once ranged across 25 U.S. states and 12 Canadian provinces. It is now believed to be extirpated from the Pacific Northwest, Southern Appalachians, and Southeast Plains regions. Currently, the species appears to be concentrated in the Midwest and Northeast U.S. (and southeastern Canada). The species was proposed for listing under the Endangered Species Act in 2016, but the Service found that listing for this species was not warranted in 2019 (84 FR 41694). The species utilizes a variety of habitats including both human dominated and natural landscapes such as agricultural lands, urban areas, woodlands, and grasslands (Williams et al. 2014). Like other bumble bees, the yellow banded bumble bee is vulnerable to a variety of factors including habitat degradation and loss, pathogens, and climate change (Williams et al. 2007). This species may be particularly vulnerable to infection from

V. bombi (Cameron et al. 2011). Very little is known about the nesting and overwintering preferences and behaviors of this species, specifically, and most of the assumed needs of this species are based on other, related bumble bees (USFWS 2018b). This species has been observed emerging early in the season and is thus thought to be especially reliant on early-season blooming floral resources such as woodland spring ephemerals (USFWS, 2018b). Further, they have also been observed foraging regularly on milkweeds (*Asclepias* spp.), beardtongues (*Penstemon* spp.), bonesets (*Eupatorium* spp.), toadflax (Linaria spp.), wild bergamot (*Monarda* spp.), currants (*Ribes* spp.), meadowsweets (*Spiraea* spp.), and vetches (*Vicia spp*.; Williams et al. 2014).

3.4.1.9 Ashton's cuckoo bumble bee (*B. bohemicus*)

Ashton's cuckoo bumble bee appears to be declining rapidly in North America, when assessed in 2014, it was occurring in only seven known sites, although the species is considered data deficient by the IUCN (Hatfield et al. 2016). Ashton's cuckoo bumble bee is a brood parasite of rusty patched and yellow banded bumble bees (Williams et al. 2014). Among other threats, cuckoo bumble bees are especially at risk of decline and extinction if their host species is declining. Aside from relying on host species for nesting habitat, very little is known about overwintering habitat of this species (Hatfield et al. 2016). While cuckoo bumble bees largely do not collect pollen, they still feed on flowers. Ashton's cuckoo bumble bee has been observed feeding on wild onions (*Allium* spp.), spikenards (*Aralia* spp.), button bushes (*Cephalanthus* spp.), bonesets (*Eupatorium* spp.), beardtongues (*Penstemon* spp.), brambles (*Rubus* spp.), and goldenrods (*Solidago* spp.; MNHP 2020).

3.4.1.10 Variable cuckoo bumble bee (*B. variabilis*)

The variable cuckoo bumble bee has largely disappeared from recent records. Its last confirmed observation was in 1999 despite increasing survey efforts. The variable cuckoo bumble bee was historically widespread throughout the eastern U.S. and is a brood parasite of the American bumble bee. Among other threats, cuckoo bumble bees are especially at risk of decline and extinction if their host species is declining (Tyler et al. 2021b). Aside from relying on host species for nesting habitat, very little is known about overwintering habitat of this species (Hatfield et al. 2016b). While cuckoo bumble bees largely do not collect pollen, they still feed on flowers. Variable cuckoo bumble bees have been observed feeding on asters (*Symphyotrichum* spp.), beggarticks *(Bidens* spp.), coneflowers (*Echinacea* spp.; *Ratibida* spp.), sunflowers (*Helianthus* spp.), and goldenrods (*Solidago* spp.; Williams et al. 2014).

3.4.1.11 Suckley's cuckoo bumble bee (*B. suckleyi*)

Suckley's cuckoo bumble bee was historically widespread throughout the northwestern U.S. The species occurred in prairies, grasslands, meadows, savannas, and agricultural landscapes. Suckley's cuckoo bumble bee is a brood parasite of the western bumble bee and potentially other species which utilize a similar life strategy. Among other threats, cuckoo bumble bees are especially at risk of decline and extinction if their host species is declining (Tyler et al. 2021b). The western bumble bee is the most widely known host of Suckley's cuckoo bumble bee (Hobbs 1968, p. 164; Williams et al. 2014, p. 165; Lhomme and Hines 2019, p. 128). Additional threats likely affecting Suckley's cuckoo bumble bee identified in the 2024 proposed rule, published on December 17, 2024 (89 FR 102074). The proposed rule findings is to list Suckley's cuckoo bumble bee as endangered under the ESA. Threats include habitat conversion and fragmentation, pesticides, pathogens, livestock grazing, climate change, managed bees,

and low genetic diversity (89 FR 102074). Suckley's cuckoo bumble bee has been observed feeding on asters (*Symphyotrichum* spp.), thistles (*Cirsium* spp.), goldenrods (*Solidago* spp.), and species in the bean family (Fabaceae).

4 EFFECTS OF THE ACTION

4.1 EFFECTS TO THE COVERED SPECIES

In addition to a primary purpose of developing this Opinion for the issuance of an enhancement of survival permit, which is to determine whether an action is likely to jeopardize a the continued existence of two currently listed covered species and the one proposed species in this opinion we also structured our analysis to determine whether the proposed action would provide a net conservation benefit to all of the covered species. This is a requirement for Conservation Benefit Agreements [50 CFR 17.22(d)(2)]. Given the limited information known about some of the covered species and that the impacts of proposed action will likely affect all covered species similarly, we chose to analyze the impacts of issuance of the EOS permit for the covered species.

"Effects of the action refers to the direct and indirect effects of an action on the species or critical habitat, together with the effects of other activities that are interrelated or interdependent with that action, that will be added to the environmental baseline. The environmental baseline includes the past and present impacts of all Federal, State, or private actions and other human activities in the action area, the anticipated impacts of all proposed Federal projects in the action area that have already undergone formal or early section 7 consultation, and the impact of State or private actions which are contemporaneous with the consultation in process. Indirect effects are those that are caused by the proposed action and are later in time, but still are reasonably certain to occur. Interrelated actions are those that are part of a larger action and depend on the larger action for their justification. Interdependent actions are those that have no independent utility apart from the action under consideration."

4.1.1 Anticipated Extent, Timing, and Duration of Enrollment

All the actions included in the Agreement as conservation measures or covered activities are expected to have an impact on the covered species and their respective foraging, nesting, and overwintering habitat, whether positive or negative, as the actions are primarily tied to vegetation and land management. The Agreement is intended to improve vegetation and land management practices and operational attitudes and understandings (relative to covered species) within both energy and transportation sectors that rely upon rights-of-way and their associated facilities. Vegetation and land management for rights-of-way are ongoing practices that have historically focused on maintenance, safety, and reliability, and not on habitat conservation. The Agreement formalizes and promotes improvements in habitat for the covered species on the enrolled lands by promoting conservation measures that adapt the timing, frequency, or method of common operations, maintenance, and modernization activities applied by Partners. Considering these assumptions, the actions undertaken by the Agreement do not pose a significant negative change from

current operations but instead improve bumble bee habitat conditions on enrolled lands. As conservation measures are required to occur on all enrolled lands, habitat created, maintained, restored, and enhanced annually is anticipated to provide an equal or greater conservation benefit than the negative impacts of any temporary or permanent habitat loss occurring as a result of covered activities within the enrolled lands for each Partner.

We chose to use an evaluation of the potential effects of the enrollment using both overall enrollment acres over the Agreement term, which includes any acreage enrolled in a NLA using nest density estimate changes over time. The overall enrollment acreage analysis used an estimate of enrollment acres by sector and used similar numbers selected in the Monarch CCAA Conference Opinion analysis (Service 2020). We also are using what we consider a High Enrollment scenario with 13,000,000 acres initially enrolled in the energy sector and 15,000,000 acres enrolled in the transportation sector to estimate the Implementation Rate and Acreage that will likely be achieved over the course of the Agreement and the anticipated estimate of covered species nests under the High Enrollment scenario per sector (Table 5). The total enrollment acres estimate does include any neighboring landowners that may apply and enter into a NLA with the Program Administrator. See 5.5 of the Agreement for more details of the requirements to enter in this role.

The nest density analysis of the effects, we assume a consistent estimated nest density for the covered species across the covered lands. Specifically, this assumption is based on the rusty patched bumble bee Section 7 guidance (v. 3.31, April 18, 2025) and estimated that the covered species are distributed equally across their respective ranges at a density of one nest for every 2.2 hectares (5.4 acres) of suitable nesting habitat (USFWS 2025). While this assumption removes differences in nest density that likely vary by species, land use and habitat condition, landscape context, and broader geography, this conservation assumption can be used to quantitative assess the impacts of each action on *potential* nests, and aid in ensuring a net conservation benefit is delivered and also provided an consistent estimate of potential impacts on covered species habitat that may occur annually or over the life of the Agreement term, 35-years. We breakdown of the estimated number of nests affected by cumulative actions per 1,000 acres enrolled in the Agreement overall and by land use sector, under baseline or pre-enrollment and enrollment scenarios, on an annual basis (Table 6).

Table 5. High Enrollment scenario estimates for conservation measure/habitat set-aside implementation acreage and high enrollment scenario nest estimates based on annual estimated benefits by sector during enrollment under the Agreement. See Appendix D in the Agreement for more details of the enrollment estimates included in the analysis.

Sector	High Enrolled Estimate (acres)	Minimum Implementation Rate and Acreage[6]	Estimated Covered Species Nest/ 1,000 Acres		High Enrollment Nest Estimates
			Baseline Nest Estimates	Enrollment Nest Estimates	
Energy Sector	13,000,000	8% / 1.040,000	56	214	2,782,000
Transportation Sector	15,000,000	8.0% / 1,200,000	79	93	1,395,000

[6] This acreage is calculated by combining the required minimum set-aside (5%) and active conservation measure (3%) requirement within the Agreement for all enrolled Partners.

Additionally, the applicant developed a detailed analysis of the likely effects of the proposed activities, the likelihood of these activities occurring, a maximum estimated amount, and other factors to estimate and verify the anticipated net conservation benefit. The Agreement applicant did this through elicitation from nine industry Partners with an average of 20 years' experience in their respective roles and/or fields, which the Program Administrator and the Service will use for estimates of likely impacts to covered species, see Appendix D of the Agreement for more details. Within the Opinion are summarized tables and estimates while others can be found within the Agreement and Appendix D.

Table 6. Annual estimates of effects of cumulative actions and estimated net conservation benefit (i.e., the Net Change in Nests) on covered species nests by the baseline and the effects analysis for the cumulative actions by Partner sector. Estimates are for 1,000 acres. Positive values indicate actions that are expected to result in positive effects on the covered species nests, while negative values indicate actions expected to result in negative effects on the covered species nests. See Appendix D of the Agreement for a breakdown of all the Agreement's actions and estimate effects analysis.

Sector	Baseline Scenario (Pre-enrollment)[7] (Nests Affected/ 1,000 acres)	Effects Analysis of cumulative Actions (Nests Affected/ 1,000 acres)	Estimated Net Conservation Benefit (Nests Affected/ 1,000 acres)
Energy Sector[8]	56	214	158
Transportation Sector	79	93	14

Notably, the estimates for the extent of the actions of the Agreement are likely conservative. Specifically, we anticipate that increases in extent of beneficial actions (conservation measures) and the decreases in the extent of temporary or permanent habitat loss (covered activities) are underestimated by the cohort of representatives polled for this analysis. The representative organizations that participated in this exercise are those presently involved with the Monarch CCAA, Rights-of-Way as Habitat Working Group, or other organizations and generally have some of the highest standards for assessing vegetation management practices in the industry. In actual implementation of the Agreement, it is anticipated that many potential Partners may need to make more substantial changes to their current practices to comply with Agreement requirements and ensure the net conservation benefit is delivered. Thus, we expect that the quantitative estimates of net conservation benefit provided by this analysis, in terms of covered species nests affected, are likely on the low end of what is possible through widespread adoption of the Agreement.

Based on the described assumptions and methodology, the subsequent descriptions within the Agreement, the effects were broken down by anticipated impact to the covered species and habitat (foraging, nesting, and overwintering) along the following gradient:

[8] The energy sector includes generation, transmission, and distribution sites. See section 3.3 of this Opinion for more details.

- Creation of new habitat,
- Enhancements to existing habitat,
- Encourages programmatic changes for enrollees,
- Temporary habitat losses, and
- Permanent habitat losses.

Overall descriptions of the effects of specific activities will be described in the text hereafter, with sector specific estimates of extents described in detail in Appendix D of the Agreement.

4.1.1.1 *Creation of New Habitat*

Conservation measures such as seeding diverse floral resources and creating new bumble bee habitat areas are expected to create new foraging, nesting, and overwintering habitat within the Agreement. The inclusion of seeding diverse floral resources as a conservation measure can help propel Partners who regularly conduct post-disturbance seeding to include more native, diverse species known to be preferred or beneficial to the covered species in their mixes. Additionally, this measure may also spur the voluntary creation of suitable habitat areas on enrolled lands where suitable habitat was previously limited or non-existent. Overall, the extent to which these conservation measures will be implemented is expected to be minimal (increase of approximately 1% of enrolled lands from a baseline scenario), but data and industry insight suggests that the Agreement will be a catalyst and lead to an increased effort to implement native seeding practices and explicit habitat creation.

4.1.1.2 *Enhancement of Existing Habitat*

Multiple measures and activities included in the Agreement are expected to enhance existing habitat (regardless of present quality) through the strategic implementation of targeted vegetation management practices. Foraging, nesting, and overwintering habitat enhancement will be delivered primarily through measures that are considered "active" conservation measures, including the implementation of: conservation mowing, brush removal that sustains floral resources, targeted herbicide applications, and prescribed burning or grazing. These conservation measures are actions that many of the potential Partners to the Agreement are already implementing to some extent, the premise of the Agreement hinges on the adjustment of current practices to better support the covered species and their habitat.

For instance, mowing and brush removal are common practices implemented by ROW managers. However, the expectation of these measures is that Partners will look to shift these practices to better support the covered species or their habitats either through timing adjustments, spatial considerations, or targeted species approaches. Conservation mowing and brush removal are assumed to vary spatially on an annual basis. The maximum extent is assumed to be limited by the extent of area occupied by infrastructure, or by green space required for security, safety, operational needs, or other activities. While mowing could result in direct mortality to individual bees outside the nest, nesting bees, and overwintering queens, conservation mowing is expected to have an overall positive effect on the covered species through timed, periodic, or rotational mowing that sustains areas of habitat during off-cycle periods and minimizes direct impacts and temporary foraging habitat losses. These actions will result in

temporary reduction of nectar and pollen resources but a sustained or increase in foraging abundance or diversity over time, as well as sustained support of vegetation that can contribute to other habitat uses. It is expected that conservation mowing and brush removal will be implemented widely by Partners and see an increase in extent of approximately 1-2%, compared to a baseline scenario.

Similarly, the implementation of targeted herbicide treatments is meant to be implemented as an adjustment in current vegetation management practices where broadcast herbicide applications are currently used. Targeted herbicide applications will reduce overall herbicide applications by applying spot treatments to undesirable (invasive, noxious, or otherwise incompatible) species while minimizing application and drift to non-target species that may be beneficial to the covered species and foraging habitat. It is expected that targeted herbicide applications will also be adopted widely by Partners, with an expected increase in extent of implementation upwards of 2% from a baseline scenario. Targeted herbicide application would indirectly affect bumble bees via a reduction in the short-term temporary availability of nectar and pollen resources. However, it would have a long-term positive effect on bumble bees through the sustained increase on foraging abundance and diversity. Targeted herbicide applications are a conservation measure that reduces competition of non-native invasive plant species and will likely increase diversity of native plant species, thereby increasing floral resources for bumble bee foraging. Therefore, targeted herbicide application is not likely to have an adverse effect on bumble bee populations on enrolled lands (USFWS 2021).

Prescribed burning and prescribed grazing may also encourage the enhancement of existing habitat through careful and thoughtful implementation. The use of prescribed burning and prescribed grazing is expected to have an overall positive impact on foraging, nesting, and overwintering habitat when implemented properly. Prescribed burning or prescribed grazing will result in short-term and temporary losses of habitat due to the removal of vegetation but will overall result in sustained or increased long-term foraging abundance and diversity, as well as the sustained or increased mature vegetation structure necessary to support nesting and overwintering. This activity is not anticipated to adversely affect the covered species or their habitats on enrolled lands. These practices are not widely used by rights-of-way managers in the energy and transportation sectors but are occasionally employed on select parcels for specific conservation initiatives. As such, we anticipate the implementation of these measures to change minimally from a baseline scenario. However, the Agreement may encourage Partners to consider these measures in site specific conservation planning initiatives.

The implementation of controlling invasive species for conservation purposes, rather than for strictly operational, maintenance, or regulatory purposes, is expected to encourage Partners to voluntarily and strategically engage in robust invasive species management practices and target such efforts in areas where high quality foraging habitat may presently exist. The control of invasive species for conservation purposes will have positive impacts on foraging habitat quality by removing competition from weedy, invasive, and noxious species and allowing for the establishment of native flowering vegetation which provides crucial nutrients for the covered species. Based on elicitation from potential Partners, we expect the extent of implementation of this measure to be relatively limited (an increase of < 1% from a baseline scenario). However, even small-scale implementation of this measure over the term of the Permit could have large impacts on areas of high-quality foraging habitat.

Lastly, the implementation of suitable habitat set-asides, a mandatory conservation measures to be implemented by Partners at a minimum extent of 5%, will encourage the enhancement of existing areas of suitable foraging, nesting, and overwintering covered species habitat by committing specific lands to remaining undisturbed for a given year. Undisturbed vegetation may promote foraging, nesting, and overwintering resources to establish and develop. While many of the Partner's lands will be *de facto* set-aside from disturbance prior to enrollment on an annual basis, the commitment to establishing suitable habitat set-asides assures that specific areas will have the opportunity to support the covered species.

4.1.1.3 *Encourages Programmatic Changes for Enrolled Partners*

Many of the measures and activities specified in the Agreement will encourage overarching, programmatic changes in Partner organizations that will lead to a net conservation benefit being delivered in terms of increasing foraging, nesting, and overwintering habitat quantity and quality across the covered lands. Measures that are expected to lead to overarching, system changes that support habitat include those minimizing exposures to stressors and direct impacts, those that increase knowledge of the covered species and their habitats, and those that encourage advanced conservation commitments. Each of these measures were developed and are expected to create broad changes that have indirect impacts on suitable habitat types and the covered species.

Measures that are expected to lead to overarching, programmatic changes that support habitat by way of minimizing exposures to stressors and direct impacts include avoidance of known or observed nest sites, reducing managed bee conflicts, mowing to reduce exposures to pesticides and physical risks, reducing exposures to mowing-related stressors, and reducing pesticide exposures through Partner-specific policies and planning. These measures reduce directs impacts to covered species by managing their interactions with habitat areas which expose them to stressors or direct harm.

Each partner will be required to implement training and practices for their staff and contractors that support the avoidance of known or observed nest sites of the covered species. Partners will be required to implement this measure on all enrolled lands. As such, it is expected that this conservation measure will help staff and contractors avoid instances of covered species nesting or overwintering when identified while conducting other conservation measures or covered activities. This measure supports the continued existence of nesting and overwintering sites each year, while also contributing to programmatic changes and awareness in the operations of the Partner organizations, including Partner staff and contractors, which may have a much farther reach as they often work for multiple clients.

Reducing managed bee conflicts through planning and placement of managed bee hives (when their placement cannot be avoided) is expected to minimize interactions between bees and the covered species by placing the hives away from areas of high-quality natural habitat, maintaining low levels of competition for resources as much as possible. Mowing to reduced exposure to pesticides and physical risks is expected to be implemented mainly by transportation organizations with the aim of minimizing exposure to contaminated habitat as well as minimizing exposure to direct mortality from moving vehicles by preventing the development of habitat in less suitable locations (along roadsides, for example). The implementation of mowing in this manner may spatially shift where habitat occurs and will encourage Partners to emphasize the management of higher quality habitat in more suitable locations.

Reducing exposures to mowing-related stressors will be implemented through the adjustment of mowing practices, when applicable, to minimize temporary impacts to foraging habitat removals. Specifically, Partners will implement practices such as increased mower deck heights, the use of a flushing bar, and mowing at a slower speed, which will both reduce direct mortality but also minimize the complete removal of floral resources, nests, or overwintering queens during mowing. Lastly, by promulgating specific policies and procedures for staff and contractors in the form of an integrated pest management (IPM) plan, Partners can reduce the impact of pesticides on habitat. It is envisioned that these measures will be used to establish thresholds, targets, and guidelines for the minimal application of herbicides, insecticides, and other pesticides that may negatively impact the covered species directly or indirectly through habitat effects on the enrolled lands.

Measures that are expected to lead to overarching, programmatic changes that support habitat by way of increasing knowledge of the covered species and their habitats include collecting and sharing data on bumble bee presence, conducting bumble bee surveys using Service-approved protocols, and funding or conducting research that informs bumble bee conservation. These measures will help reduce impacts to covered species and their habitats indirectly by informing Partner-specific and broad-scale conservation initiatives and adjustments in practices. One of the most pressing threats to the covered species and their respective habitats is a lack of data and scientific understanding. We assume that the implementation of these measures will increase overall understanding of the covered species, as well as overall understanding of the qualities and quantities of foraging, nesting, and overwintering habitat needed to support the long-term recovery of these species.

Measures that are expected to lead to overarching, programmatic changes that support habitat by way of encouraging advanced conservation commitments include implementing BMPs to limit the spread of invasive species, encouraging enrollment in complementary certification programs, maintaining a bumble bee conservation training program for staff and contractors, and mapping of high-quality habitat areas. These measures will both directly and indirectly contribute to the improvement, creation, and protection of habitat for the covered species through the enrolled lands. Through implementation of BMPs to limit the spread of invasive species, Partners can play a critical role in mitigating the establishment of non-native species that reduce foraging habitat quality. The implementation of BMPs will engage both Partner staff and contractors with specific actions that can reduce these threats. Enrollment in complementary certification programs will engage staff throughout Partner organizations in conversations related to conservation relevant to the covered species. It is envisioned that this conservation measure will support higher level conversations about how operations and maintenance of infrastructure can lead to unique and meaningful conservation goals for the covered species and their respective habitats. Maintaining a bumble bee conservation training program will contribute to the improvement of foraging, nesting, and overwintering habitat by encouraging staff and contractors to identify, protect, and collect data on high-quality habitat areas and features, ultimately informing larger scale conservation measure implementation and habitat management strategies. This training will also be useful in ensuring other conservation measures that positively impact habitat are properly implemented, and covered activities that negatively impact habitat are minimized to the greatest extent practicable. Finally, the identification and mapping of high-quality habitat areas through data collection, mapping, and signage initiatives will help protect particularly high-quality or intact areas of habitat from adverse and unplanned actions that may temporarily reduce foraging habitat quality and quantity, or directly harm nesting or overwintering

individuals or conditions. Overall, these measures are expected to contribute to shifts in Partner's overall land and vegetation management programs that lead to widespread improvements and protection of habitat areas and resources for the covered species.

4.1.1.4 *Temporary Habitat Losses*

In contrast to the conservation measures that are expected to contribute to foraging habitat creation, enhancement, or synergistic benefit through programmatic changes, the Agreement also includes regulatory coverage and assurances for the implementation of covered activities which have been identified as necessary for the ongoing operations, maintenance, and modernization of existing infrastructure on the enrolled lands. These covered activities are expected to have small, but present negative impacts on habitat through either quality reductions or temporary removals.

Activities expected to lead to temporary habitat losses by way of quality reductions include the maintenance of managed bee hives on enrolled lands, the mowing of foraging habitat (or other vegetation removal activity), and the application of broadcast herbicide treatments. Due to the nature of the enrolled lands, and the easements and landowner relationships Partners must maintain, the placement of managed bee hives on enrolled lands may be unavoidable. Through the Agreement, Partners will be encouraged to minimize the placement of managed bee hives on their enrolled lands to the extent practicable. However, in the case where placement is unavoidable, the permit will grant coverage to impacts this may have on the covered species and associated foraging habitat. Through industry elicitation, we expect the occurrence and extent of managed bee hives placed on enrolled lands to be negligible or non-existent, and thus the impact of this scenario on the covered species and foraging habitat to be minimal.

Vegetation management that may temporarily impact foraging habitat includes activities that are conducted for maintenance purposes outside the scope or intent of those defined as conservation measures. The primary distinction between vegetation management (as a covered activity) and similar actions (as conservation measures) is that a "covered activity" is conducted within suitable habitat and in a manner likely to result in take of the covered species. This includes vegetation management activities such as broadcast application of herbicides in areas of suitable foraging habitat, mowing areas of suitable foraging habitat during the bumble bee active season to remove woody vegetation or to create temporary access routes, and vegetation management applicable to other legal or regulatory requirements that may be incompatible with habitat. Vegetation removal may also include activities such as side trimming, pruning, hand clearing, disposal of cut material through burning, chipping, dragging, and hauling, among others.

Broadcast herbicide applications are applied to all vegetation in a treatment area regardless of species or target, however broadcast treatments are assumed to be limited in application to problematic areas, or locations required for supplemental seeding and are anticipated on approximately 5% of enrolled lands annually. Broadcast herbicide applications would have a negative short-term and temporary effect on loss of foraging habitat, without enhanced foraging abundance and diversity. Unlike targeted herbicide application, broadcast application would also reduce native plant species and would not have the long-term sustained positive influence on foraging abundance and diversity that targeted applications would have. Broadcast application would result in reduced availability of nectar and pollen resources, however with avoidance and minimization measures these impacts would not likely adversely affect bumble bee

populations. Avoidance and minimization measures would include the minimization of application extent, retainment of untreated areas, and use application BMPs (USFWS 2021; USFWS 2020).

Alternatively, the mowing of habitat without timing or spatial restrictions would result in direct mortality to adults and the temporary loss of foraging habitat, which may reduce floral resources (nectar and pollen) available in the area in the long-term. Mowing is anticipated on approximately 25% of enrolled lands annually and assumed to occur in areas around infrastructure, including arrays that require mowing for vegetation height management. Avoidance and minimization measures would include ensuring a mower height of greater than 8 inches, reducing mower speeds, and mapping and tracking mowing activities. However, even with avoidance and minimization measures, mowing of foraging habitat is likely to adversely affect bumble bee populations on enrolled lands (USFWS 2018; UIC 2023).

Activities expected to lead to temporary habitat losses by way of temporary removals include small-scale (< 0.25 acres) and large-scale (> 0.25 acres) ground disturbing activities that are temporary in nature (restored to natural vegetation once completed). Ground disturbance, including grading, excavating and digging, associated with operations, maintenance, and modernization activities may have an effect on foraging habitat via the removal of nectar resources, soil compaction, removal of duff layers, and potential spread of invasive plant species. Further, the ground disturbance of these activities is expected to lead to injury or mortality to individuals in any nests and overwintering sites present in the footprint of the disturbance. Effects from these ground disturbing activities can be minimized or avoided via the use of avoidance and minimization measures. Small and temporary ground disturbance is expected to have neutral to slightly negative population effects given the lower anticipated annual acreage that these activities are likely to occur on enrolled lands. However, effects would be minimal and temporary if appropriate BMPs are utilized for disturbance and restoration,. All enrolled Partner's must avoidance any known or observed covered species nest. Therefore, small and temporary effects are not likely to adversely affect bumble bees on enrolled lands should avoidance and minimization measures and BMPs be implemented. There is a lower likelihood that these activities will directly impact nesting or overwintering queens, however, the likelihood still exists and may result in direct mortality of a queen, which would have a negative impact on the population. Large and temporary ground disturbances may have negative population effects, but with the use of appropriate AMMs and BMPs, the effects are expected to be reduced or be temporary. \

4.1.1.5 *Permanent Habitat Losses*

Lastly, in addition the temporary habitat losses assumed by the Agreement, it is anticipated that Partners will engage in activities that lead to the permanent loss of habitat as part of sustaining the ongoing operations, maintenance, and modernization of their infrastructure on enrolled lands. Through potential Partner elicitation, we anticipate the implementation of covered activities that result in permanent habitat loss under the Agreement to be small, but not zero. Specifically, activities expected to lead to permanent habitat loss include small-scale (< 0.25 acres) and large-scale (> 0.25 acres) ground disturbing activities where natural vegetation will not be restored after completion.

While new infrastructure development unassociated with existing infrastructure is not permitted by this permit, the modernization of existing infrastructure may include small footprint expansions or assets that are not compatible with natural vegetation supporting foraging habitat for the covered species. Further, the ground disturbance of these activities is expected to lead to injury or mortality to any nesting

individuals and overwintering queens present in the footprint of the disturbance. However, for both small- and large-scale, we anticipate that the extent of these permanent habitat losses will be 1% (respectively) over the 35-year term of the permit (up to 280,000 acres). This estimate is likely an overestimate given that no more than 1% of all activities included under "modernization" within the Agreement can be done on enrolled lands for a Partner, activities include temporary impacts as well as other actions that may or may not adversely affect covered species. See section 5 of the Agreement for more details. As such, small and permanent habitat removals are expected to have neutral population effects given that these acres will likely be distributed across the Agreement Area (Action Area) and over the EOS permit term (35 years). Partners will further minimize impacts by appropriate BMPs for disturbance, the effects would likely be minimal and permanent. Small and permanent ground disturbance is not likely to adversely affect covered species on enrolled lands. Large and permanent ground disturbance would have negative population effects, and proper implementation of avoidance and minimization measures would not reduce all impacts. Thus, large and permanent habitat removing activities are expected to adversely affect the covered species (USFWS 2025).

4.2 Effects to Listed and Proposed Animal Species

The Agreement and Permit is likely to cause Partners to carry out activities that will affect animals that are listed as endangered or threatened under the ESA or that are proposed for such listing using the Information for Planning and Consultation (IPaC) website to get a species list.[9] Although activities implemented in pursuit of the Agreement or under the authority of the Permit may affect these species, Partners will be required to ensure that the activities do not cause unauthorized and otherwise prohibited take of any listed or proposed species other than the covered species within the Agreement.

Partners may carry out activities pursuant to the Agreement that result in incidental take of listed or proposed animal species only if that take is authorized by (1) a separate ESA section 10 permit from the Service or (2) is the subject of an incidental take statement provided by the Service along with a biological opinion under section 7. Some Partners, for example, may hold ESA §10(a)(1)(B) incidental take permits from the Service for specific actions or programs. In those cases, the Service would have determined that it could authorize the take while ensuring that it would not jeopardize the continued existence of the species. In other cases, Partners may have been required to obtain formal approval or authorization for an action from a Federal agency. Before granting such approval, the Federal agency would have had to complete consultation with the Service to ensure compliance with section 7. In these cases, the Service would provide with its biological opinion an incidental take statement if the action was likely certain to cause incidental take. As long as the relevant agency or the applicant complies with the terms and conditions of the incidental take statement, the take described in the statement would not be prohibited.

[9] Use IPaC: Home to upload your proposed enrollment area and generated a list of proposed and listed species that may occur within your enrollment area. Interested Partners can choose to complete determination keys for listed species, if available which may streamline the Section 7 compliance check by highlighting species or critical habitat to be aware of to provided proposed avoidance and minimization measures within your application package.

We think that the preclusion from the proposed action of any activity that would result in unauthorized take of a species of listed or proposed wildlife is sufficient to ensure that it will not jeopardize any of these species. Precluding any activity likely to cause take would effectively prevent under the Agreement any significant environmental modification or degradation that would kill or injure even a single individual of a listed or proposed animal species. If a Partner proposes to engage in such an activity, they could not do so in pursuit of the Agreement or under the authority of the Permit.

The Service will require that, as part of their application for a CI, potential Partners submit a list of listed or proposed animal species that may be present on their Enrolled Lands. They will not be required to provide specific corresponding measures to avoid or minimize effects to these species.

Neighboring landowners could apply for a NLA to receive incidental take of covered species within their property by landowners (or their designees) within the 650-foot buffer is only authorized provided that the activity will not result in the take of listed or proposed animals.

4.3 EFFECTS TO LISTED AND PROPOSED PLANTS AND CRITICAL HABITAT

The Agreement and Permit will also cause Partners to carry out activities that may interact directly with listed and proposed plant species that occur in the contiguous U.S. using IPaC to create and identify any plants within the proposed enrollment area or that produce stressors to which these species may be exposed. Likewise, these activities may affect designated and proposed critical for plant or animal species. . As stated above in the description of the enrollment process, Applicants for certificates of inclusion must provide a list of specific avoidance and minimization measures (AMM) that they will use when implementing covered activities and conservation measures. The intent of the AMMs will be to avoid or minimize effects of these actions on (1) listed and proposed plant species that are likely to be present on their enrolled lands and (2) any designated or proposed critical habitats that overlap with their Enrolled Acres.

The Program Administrator, the designated non-federal representative for this Agreement, will review the AMMs to ensure that they are adequate using the compliance form to streamline this review before the Program Administrator may issue a certificate of inclusion to a potential Partner. AMMs will be adequate if they are sufficient to ensure that activities implemented under the Agreement or the Permit by the Applicant would neither (1) jeopardize the continued existence of any listed or proposed plant species or any experimental populations of a plant species nor (2) destroy or adversely modify any proposed or designated critical habitat. The Service will document its finding before the Program Administrator issues a certificate of inclusion.

This tiered review process will facilitate the avoidance and minimization of effects to listed and proposed plant species to ensure that activities implemented pursuant to the Agreement or as authorized by the Permit do not appreciably reduce their likelihood of survival and recovery. Likewise, it will ensure that Partners' activities conducted pursuant to the Agreement will not destroy or adversely modify designated or proposed critical habitat.

Neighboring Landowners may apply for a NLA that would cover incidental take of covered species by landowners (or their designees) within the 650-foot buffer is only authorized provided that the activity

will not result in take of listed or proposed plant species and will not destroy or adversely modify designated or proposed critical habitat (plant or animal).

4.4 CUMULATIVE EFFECTS

Cumulative effects include the effects of future State, tribal, local or private actions that are reasonably certain to occur in the action area considered in this biological and conference opinion. We do not consider future Federal actions that are unrelated to the proposed action in this section because they require separate consultation pursuant to section 7 of the Act.

The parts of the contiguous United States that Partners will enroll in the Agreement comprise the action area. It will contain a mix of lands owned by the Partners and lands on which they have obtained easements. Landowners granting easements may continue to operate the property at their discretion in accordance with the easement document. In some cases, restoration and maintenance of natural land cover supporting pollinators may not align with landowners' interests and easement restrictions may affect which key threats to covered species are within the control of Partners. However, or the purposes of this Agreement, , Partners would be expected to implement conservation measures, to the extent they can anticipate, in areas where Partner control over conservation actions under this Agreement will persist. Therefore, cumulative effects may largely be limited to the portions of the Enrolled Lands that do not have active conservation measures being implemented or outside the required habitat set-aside acreage.

Transportation rights-of-way and their associated lands are comprised of fee-owned lands, easements, and other access agreements across road and rail networks of various sizes. In states where rural highways are typically not fenced, those areas are often subject to 'volunteer' mowing by others. If properly signed and maintained, those areas are primarily maintained by the transportation agency, and the potential for viable habitat is more likely. Managed areas (signed and protected remnant vegetation, threatened and endangered species areas, waysides, and excess rights-of-way) already exist along rural, non-access-controlled highways. These locations may be signed to identify the asset and to prohibit mowing or spraying. These areas are typically mapped and protected by policy within all sectors of transportation agencies.

Mosquito truck ultra-low volume (ULV) spraying of insecticides (e.g., resmethrin and permethrin) for adult mosquito control could have significant effects on migrating monarchs in coastal portions of the Eastern Flyway (Fig. 1; Tracy et al. 2019, p. 454). The authors suggest that wildflower plantings might best be placed away from roads where mosquito truck ULV spraying could expose covered species within the enrollment area to insecticides.

5 SUMMARY OF EFFECTS OF THE ACTION

We expect the proposed action – the Agreement and the associated Permit – to increase the amount of foraging, nesting, and overwintering habitat in the action area and to reduce the habitats and covered species individuals exposed to management actions that may be detrimental to their continued existence. The Agreement will not prevent adverse effects to the covered species due to the Partners' activities.

Instead, it will ensure that the Partners' implementation of conservation measures on the enrolled lands will more than offset the adverse effects of their activities and ultimately deliver a net conservation benefit to the covered species. See Appendix D of the Agreement.

Under the Agreement, the Partners will implement actions on the enrolled lands to enhance the survival of the covered species. These conservation measures will include actions that address identified conservation objectives, including:

1. Maintain, protect, and enhance nesting and overwintering habitat,
2. Manage, protect, and enhance foraging habitat,
3. Minimize exposure to stressors and direct impacts,
4. Increase knowledge of population trends, species distribution, stressors, and measures to effectively conserve the species, and
5. Encourage advanced conservation commitments.

The Agreement will lead the Partners to undertake extensive efforts to increase habitat quality and quantity for the covered species on enrolled lands which could span across the entirety of the contiguous U.S. Thus, the proposed action may affect listed species and critical habitats up to an estimated 28 million acres. The potential scope and uncertainty regarding the locations of specific enrolled lands precludes an in-depth analysis of these effects to species other than the covered bumble bee species. Therefore, the Service's review of the activities that Partners propose to carry out when they apply for a CI under the ensuing Permit will be critical to ensure that the conclusions reached in this biological and conference opinion are correct.

6 CONCLUSION

The Agreement and the Permit will result in a net conservation benefit to the covered species and their respective foraging, nesting, and overwintering habitats (Table 4 and Appendix D of the Agreement). Based on the overall net benefit, it is also our conclusion that the proposed action is not likely to jeopardize the species' continued existence. The measures that Partners will implement under the Agreement and in accordance with the Permit will also ensure that effects caused by the Agreement or Permit are not likely to jeopardize the continued existence of any endangered or threatened species and will not destroy or adversely modify critical habitat. Actions caused by the Agreement or Permit that are not already subject to Section 7 review in relationship to other Federal actions will be subject to specific avoidance and minimization measures for listed and proposed plants and for designated and proposed critical habitat. The Partners will also be required to review each activity that they implement under the Agreement to ensure that they will not result in the take of any non-covered species of animal listed as endangered or threatened or proposed for such listing. The Service's ongoing participation in the implementation of the Agreement will include technical assistance and review of the Partners' actions, as needed, to ensure that these requirements are met.

7 INCIDENTAL TAKE STATEMENT

ESA §9(a)(1) and regulations issued pursuant to §4(d) prohibit the take of endangered and threatened fish and wildlife species without special exemption. The term "take" in the ESA means "to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct" (ESA §3(19)). In regulations, the Service further defines:

- "harm" as "an act which actually kills or injures wildlife. Such act may include significant habitat modification or degradation where it actually kills or injures wildlife by significantly impairing essential behavioral patterns, including breeding, feeding or sheltering;" (50 CFR §17.3) and
- "incidental take" as "takings that result from, but are not the purpose of, carrying out an otherwise lawful activity conducted by the Federal agency or applicant" (50 CFR §402.02).

Under the terms of ESA §7(b)(4) and §7(o)(2), taking that is incidental to a Federal agency action that would not violate ESA §7(a)(2) is not considered prohibited, provided that such taking is in compliance with the terms and conditions of an incidental take statement (ITS).

The incidental take statement provided in this conference opinion does not become effective until the species is listed and the conference opinion is adopted as the biological opinion issued through formal consultation. At that time, the project will be reviewed to determine whether any take of covered species (at-risk bumble bees) has occurred. Modifications of the opinion and incidental take statement may be appropriate to reflect that take. No take of the covered species may occur between the listing of the currently non-listed covered species (9 out of 11 species) and the adoption of the Opinion through formal consultation, or the completion of a subsequent formal consultation.

7.1 RELATIONSHIP TO ENHANCEMENT OF SURVIVAL PERMIT & THE CBA

Under ESA §10(a)(1)(A), the Service may authorize incidental take of endangered or threatened wildlife that is caused by otherwise lawful non-Federal actions through an EOS Permit, provided that such authorization satisfies all permit issuance criteria. In this case, the Service proposes to issue an EOS Permit to the Program Administrator to accompany the Conservation Benefit Agreement (CBA). The EOS Permit would authorize the Program Administrator – and the parties to which it will issue CIs (collectively, the Permittees or Partners) – to incidentally take the covered species of bumble bees in accordance with the permit conditions and the associated CBA. This EOS Permit applies only to incidental take that the Permittees cause on lands outside of federal jurisdiction.

At the time of authorization by the Service, the EOS Permit and associated CBA include the following eleven bumble bees as covered species:

- Rusty patched bumble bee (*Bombus affinis*; endangered)
- Crotch's bumble bee (*Bombus crotchii*; not federally listed)
- Franklin's bumble bee (*Bombus franklini*; endangered)
- Southern plains bumble bee (*Bombus fraternus*; petitioned)

- Morrison's bumble bee (*Bombus morrisoni*; petitioned)
- Western bumble bee (*Bombus occidentalis*; petitioned, under review)
- American bumble bee (*Bombus pensylvanicus*; petitioned, under review)
- Yellow banded bumble bee (*Bombus terricola*; not federally listed)
- Ashton's cuckoo bumble bee (*Bombus bohemicus*; not federally listed)
- Variable cuckoo bumble bee (*Bombus variabilis*; petitioned, under review)
- Suckley's cuckoo bumble bee (*Bombus suckleyi*; proposed endangered)

Under an ESA §10(a)(1)(A) EOS Permit, the Federal action itself includes the authorization for incidental taking of listed wildlife species. In addition, the EOS Permit specifies all the necessary and appropriate measures – in addition to those proposed in the Agreement – that the Permittees must implement to avoid and minimize the impacts of the anticipated incidental taking. These measures include reporting requirements.

Therefore, with respect to activities that will be implemented in accordance with the proposed CBA on non-federal lands, we incorporate by reference from any §10(a)(1)(A) permit(s) issued with respect to the proposed Agreement all required (non-discretionary):

- Conservation measures,
- Terms and conditions,
- Monitoring and reporting requirements, and
- Provisions for the disposition of dead or injured animals.

7.2 RELATIONSHIP TO CANDIDATE CONSERVATION AGREEMENT

The rest of this incidental take statement (ITS) addresses only actions that the Permittees would carry out pursuant to the Candidate Conservation Agreement on Federal lands. As stated above, the EOS permit authorizes incidental take that occurs on non-Federal lands.

For the exemption in ESA §7(o)(2) to apply to the Action considered in this opinion, the Service and the Applicant must undertake the non-discretionary measures described in this ITS, and these measures must become binding conditions of any permit, contract, or grant issued for implementing the Action. Consistent with ESA section 7(b)(4)(C)(iv), the Services has a continuing duty to regulate the activities covered by this ITS that are under its jurisdiction. The Applicant is responsible for the activities covered by this ITS that are under its control and are not under the Service's jurisdiction. The protective coverage of §7(o)(2) may lapse if the Service or Applicant fails to:

- assume and implement the terms and conditions; or
- require a permittee, contractor, or grantee to adhere to the terms and conditions of the ITS through enforceable terms that are added to the permit, contract, or grant document.

To monitor the impact of incidental take, the Service and the Applicant must report the progress of the Action and its impact on the species to the Service as specified in this ITS.

7.3 AMOUNT OR EXTENT OF TAKE

This section specifies the amount or extent of incidental take of the covered species that the Action is likely to cause. As we explain below, we rely on a surrogate – the anticipated number of conservation action implementation acres (Implementation Acres) on Enrolled Lands as determined by sector-specific High Enrollment scenario estimates – to describe, measure and monitor the extent of incidental take.

7.3.1 Use of a Surrogate to Express the Extent of Anticipated Take of Covered Species

When it is not practical to monitor take in terms of individuals of the listed species, the regulations at 50 CFR §402.14(i)(1)(i) indicate that an ITS may express the amount or extent of take using a surrogate (*e.g.,* a similarly affected species, habitat, or ecological conditions), provided that the Service also:

- describes the causal link between the surrogate and take of the listed species; and
- sets a clear standard for determining when the level of anticipated take has been exceeded.

7.3.2 Causal Link between the Surrogate and Incidental Take of the Covered Species

The net conservation benefit delivered by the Agreement will have a causal link to the anticipated incidental take of the covered bumble bee species. The Agreement is meant to facilitate and encourage the adjustment of common vegetation management actions to ensure they contribute to a net increase in quantity and quality of habitat for the covered species. Many of these actions would occur, in some capacity, without Partner enrollment. The number of Implementation Acres, as determined by both the sector-specific Enrolled Acres and anticipated implementation rates, will have a causal link to the anticipated incidental take of the covered species. Implementation rates are the minimum percentage of Enrolled Lands in each sector on which Partners must apply conservation measures to enhance, restore, and maintain covered species habitat, which includes habitat set-asides each year. The implementation rate will determine the extent of Implementation Acres relative to the total extent of Enrolled Lands in each sector. The minimum number of Implementation Acres will be determined by multiplying the number of Enrolled Acres by the minimum anticipated 8% implementation rate.

Incidental take is likely to occur both inside and outside of Implementation Acres including on neighboring landowners who choose to participate in a NLA with the Program Administrator. On the Implementation Acres, the Permittees will implement conservation measures or be habitat set-asides for covered species that are designed to provide a net benefit to the covered species. Outside of the Implementation Acres, enrolled Partners and neighbors with NLA may implement approved covered activities in covered species habitat without any modification to reduce effects to the covered species.

7.3.3 Amount of Anticipated Take as Reflected by the Surrogate Measure – Implementation Acres

To meet the minimum standard for incidental take established for this ITS, the total number of Implemented Acres must equal or exceed the number that should be present based on the anticipated Implementation rates (Table 6). It will not be necessary for the minimum implementation rates to be met

within each sector. If the collective number of acres that Partners implement for conservation (set-asides or active conservation measures) in any year is less than what should have been adopted based on 1) the number of enrolled acres and 2) the anticipated implementation rates, then the level of anticipated incidental take will have been exceeded. For our analysis example, we estimate a high enrollment scenario of 28,000,000 acres divided between the two major sectors, the *total* Implementation Acres must be at least 2,240,000 (Table 7). If the total number of Implementation Acres were less than 2,240,000 in this example, the level of incidental take would have been exceeded.

Table 7. An example scenario – equivalent to the High Enrollment scenario analyzed in the opinion for the Agreement period of 35 years – in which 28,000,000 acres are enrolled in the Agreement and divided between the two major sectors, as shown. In this scenario, the anticipated level of incidental take would not be exceeded as long as there are at least 2,240,000 Implementation Acres for the entire Agreement.

Sector	Enrolled Lands (acres)	Anticipated Implementation Rate	Implementation Acres
Energy	13,000,000	8.0%	1,040,000
Transportation	15,000,000	8.0%	1,200,000
Total	*28,000,000*		*2,240,000*

7.3.4 Why it is not practical to Monitor Take-Related Impacts in Terms of Individual Bumble Bees

For the covered bumble bee species, detecting take that occurs incidentally to the action is not practical. Bumble bees are small, hard to detect, and challenging to identify to the species level without advanced training. Further, bumble bee nesting and overwintering sites, which are most likely to be affected by the actions included in the Agreement, are cryptic, and preferences about the species preferred locations for these are not well understood.

7.4 Reasonable and Prudent Measures

The Service believes the reasonable and prudent measure (RPM) we describe in this section for the bumble bees is necessary or appropriate to minimize the impact, *i.e.,* the amount or extent, of incidental take caused by the Action.

We indicate whether the Service or the Applicant is responsible for each RPM described in the remainder of this section, for the terms and conditions that implement the RPMs described in section 7.5, and for the monitoring and reporting requirements.

RPM #1. Coordinate with affected Federal land management agencies.

At times, the Permittees will carry out activities that will affect covered species on Federal lands. The relevant Federal land management agencies are likely to have their own objectives for covered species conservation on their lands and to be planning and implementing actions to conserve the species. In addition, they are likely to hold special expertise with regard to the status and trends of the species and its habitat in the areas where Permittees will propose to implement covered activities, conservation measures, or both. Therefore, Permittees shall coordinate with the relevant land management agencies to reduce negative effects to bumble bees and to minimize the extent of incidental take. This coordination

will also allow Permittees to ensure that Federal land management agencies are aware of their enrollment in the CCA and of this incidental take statement.

7.5 TERMS AND CONDITIONS

In order for the exemption from the take prohibitions of §9(a)(1) and of regulations issued under §4(d) of the ESA to apply to the Action, the Service and the Applicant must comply with the terms and conditions (T&Cs) of this statement, provided below, which carry out the RPM described in the previous section. These T&Cs are mandatory. We identify whether the Service, the Applicant, or both are responsible. As necessary and appropriate to fulfill this responsibility, the Service must require any permittee, contractor, or grantee to implement the T&Cs that apply to Action activities under its jurisdiction through enforceable terms that the Service includes in the permit, contract, or grant document. The Applicant must implement, or ensure that any agent or contractor implement, the T&Cs that apply to Action activities that are not under the Service's jurisdiction.

7.5.1 T&C #1 (RPM #1). Notify and coordinate with Federal land management agencies.

Before carrying out covered activities or conservation measures for the covered species on Federal lands in pursuit of the Agreement, holders of Certificates of Inclusion (Partners) shall provide the relevant Federal land management agency with an explanation of the proposed activities and their objectives. This notification shall include all activities that the Partner will carry out on lands under the jurisdiction of the land management agency that are included in their Certificate of Inclusion. This notification may be conducted programmatically for all activities undertaken by a Partner on Federal lands. As part of this notification, the Permittees shall request the agency's input on any aspect of the activities that could affect monarchs and that could avoid or minimize effects to the covered species or further enhance the benefits of proposed conservation measures.

This term and condition does not alter any existing notification requirements and timeframes already in place on the Permittee's easements or permits across Federal lands. It requires Partners only to notify relevant agencies but does not require additional permissions or approvals beyond those already required under existing easements or permits from the agencies. For example, if a Partner has notified relevant agencies, but does not receive a response, this requirement is considered as fulfilled for the purposes of this term and condition.

To ensure that agency staff at the appropriate level are aware of activities that affect covered species on the lands for which they have primary management responsibility, a Partner shall contact specific Federal land managers when acquiring special use permits, access permits, or other authorization notices. Notification is intended to be conducted at this local level, rather than contacting regional or national headquarters offices. The Program Administrator will provide assistance to the Partners if they are uncertain of the appropriate agency contacts.

7.6 MONITORING AND REPORTING REQUIREMENTS

To monitor the impacts of incidental take, the Service and the Applicant must report the progress of the Action and its impact on the species to the Service as specified in the incidental take statement (50 CFR

§402.14(i)(3)). This section provides the specific instructions for such monitoring and reporting (M&R), including procedures for handling and disposing of any individuals of a species actually killed or injured. These M&R requirements are mandatory. We identify whether the Service, the Applicant, or both are responsible.

As necessary and appropriate to fulfill this responsibility, the Service must require any permittee, to accomplish the monitoring and reporting requirements that apply to Action activities under its jurisdiction through enforceable terms that the Service includes in the permit. Such enforceable terms must include a requirement to immediately notify the Service if the amount or extent of incidental take specified in this ITS is exceeded during Action implementation.

The Applicant (the Program Administrator) must accomplish or ensure that any agent or contractor accomplish the monitoring and reporting requirements that apply to Action activities. The Applicant must immediately notify the Service if the amount or extent of incidental take specified in this ITS is exceeded during Action implementation. To determine whether the amount or extent of incidental take has been exceeded, see the section 7.3.3 Amount of Anticipated Take as Reflected by the Surrogate Measure – Implementation Acres, above.

M&R #1. Annual summary of acres enrolled by major sector and Implementation Acres.
As part of its annual reporting to the Service, the Program Administrator will compile information from the Certificate of Inclusion holders and will report to the Service the acres enrolled by major sector (energy and transportation) and the Implementation Acres (the habitat set-aside and active conservation acres) for each Partner and in the Agreement as a whole.

M&R#2. Disposition of Dead or Injured Specimens
We will not require the collection or recording of dead or injured covered species encountered by personnel in the field. Covered species killed or injured by activities covered under the Agreement will seldom be detected due to the small size and cryptic nature of most life stages. Individuals injured are unlikely to be in a condition that would warrant attempts to provide aid.

8 REINITIATION NOTICE

This concludes formal consultation on the action outlined above under Description of the Action.

As provided in 50 C.F.R. § 402.16(a) (2023), reinitiation of formal consultation is required and shall be requested by the Federal agency or by the Service, where discretionary Federal involvement or control over the action has been retained or is authorized by law and:

if: (1) the amount or extent of incidental take is exceeded; (2) new information reveals effects of the agency action that may affect listed species or critical habitat in a manner or to an extent not considered in this opinion; (3) the agency action is subsequently modified in a manner that causes an effect to the listed species or critical habitat not considered in this opinion; or (4) a new species is listed or critical habitat designated that may be affected by the action. In instances where the amount or extent of incidental take

is exceeded, the exemption issued pursuant to section 7(o)(2) may have lapsed and any further take could be a violation of section 4(d) or 9.

9 CONSERVATION RECOMMENDATIONS

1. Support the development of, and adopt if supported by research, new technologies used to monitor habitat quality and covered species populations in coordination with the Service.
2. Further incentivize the implementation of conservation through habitat set-asides or active conservation on Enrolled Lands beyond the minimum requirement in the Agreement.
3. Coordinate with the Service on opportunities to develop and implement population and life history research. The Service is positioned to develop timely and important conservation research ideas in close collaboration with state conservation agencies, NGOs and other conservation organization for covered species.

10 LITERATURE CITED

Contact the Midwest Regional Office for a complete list of literature cited.