Addressing Endangered Species Act 7(a)(1) and 7(a)(2) Obligations:

Plan to Promote the Recovery of Species and Streamline Consultation

for Conventional Pesticides

and Endangered Species Act Listed Species

Under the Authority of the US Fish and Wildlife Service

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Office of Pesticide Programs Office of Chemical Safety and Pollution Prevention U.S. Environmental Protection Agency Washington, DC



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Acronyms

| AAPCO | Association of American Pesticide Control Officials | | | |
|--------|---|--|--|--|
| BE | Biological Evaluation | | | |
| BiOp | Biological Opinion | | | |
| BLT | Bulletins Live! Two | | | |
| CONUS | Contiguous United States | | | |
| EPA | Environmental Protection Agency | | | |
| ESA | Endangered Species Act | | | |
| FFDCA | Federal Food Drug and Cosmetic Act | | | |
| FIFRA | Federal Insecticide, Fungicide, and Rodenticide Act | | | |
| FWS | Fish and Wildlife Service | | | |
| IEM | Interim Ecological Mitigations | | | |
| OPP | Office of Pesticide Programs | | | |
| ORD | Office of Research and Development | | | |
| PULA | Pesticide Use Limitation Area | | | |
| SFIREG | State FIFRA Issues Research and Evaluation Group | | | |
| USDA | United States Department of Agriculture | | | |
| VSAP | Vulnerable Species Action Plan | | | |
| | | | | |

Executive Summary

The purpose of this document is to describe the Environmental Protection Agency (EPA) Office of Pesticide Program (OPP)'s plan for furthering the recovery of federally listed endangered and threatened ("listed") species under the Endangered Species Act (ESA) section 7(a)(1) and resultant streamlining of ESA section 7(a)(2) consultations for conventional pesticides (FIFRA-ESA process). Under ESA section 7(a)(1), all federal agencies, including the EPA, are required to use their "authorities in furtherance of the purposes of this Act by carrying out programs for the conservation of endangered species and threatened species." EPA's OPP developed this plan to describe how it will further contribute to the recovery of listed species by reducing the population-level impacts of pesticides. This plan addresses all listed species and critical habitats under the authority of the United States (US) Fish and Wildlife Service (FWS). The plan describes EPA's proactive, strategic, large-scale approach to assessing and reducing impacts of pesticides to listed species. Under Section 7(a)(2), federal agencies shall ensure that their actions are "not likely to jeopardize the continued existence of any endangered species or threatened species or result in the destruction or adverse modification of habitat of such species." EPA also expects to streamline 7(a)(2) consultations by implementing large scale mitigation approaches (referred to as "multi-chemical approaches") in the pesticide registration and registration review process, allowing subsequent consultations to focus on any remaining impacts that still require mitigation¹. EPA has worked with FWS to develop this plan, which is the basis for an interagency agreement between the agencies on 7(a)(1) and 7(a)(2) consultation.

EPA is developing several approaches to account for the characteristics of each pesticide and identify landscape-scale mitigations, as appropriate, based on location, pesticide class, species, and use site. These approaches are underpinned by grouping pesticides and species potentially impacted. Grouping species or pesticide uses based on their similarities will allow EPA to efficiently identify and implement mitigations necessary to further EPA's goal to reduce the potential for impacts to and stressors on listed species. Reductions of pesticide exposures are expected to help species recovery by reducing the impacts of pesticides on listed species. These approaches are intended to consider pesticide-specific information (e.q., use, fate and toxicity) to identify appropriate levels of mitigations (also referred to as "conservation measures") needed to reduce impacts on listed species. In general, EPA's mitigations involve minimization of pesticide exposures by reducing the potential for pesticides to be transported from treatment areas to areas inhabited by listed species. In some cases, mitigations may involve avoidance (prohibition) of direct applications to specific areas inhabited by listed species. In cases where avoidance and minimization are not feasible, EPA is also exploring use of offsets, also known as compensatory mitigation, to conserve species. Offsets involve compensating for loss of individuals of a population through creation of habitat or other means to restore the individuals lost from pesticide exposures. EPA is working closely with FWS throughout the development of these approaches to ensure that both agencies agree that the approaches are likely to meet their purposes. Using these approaches, EPA intends to proactively reduce pesticide exposures to listed species before EPA initiates or completes formal consultation with FWS, thus expediting protections likely needed to reduce impacts. Part of EPA's approach also involves making the formal consultation on specific actions more efficient so that EPA and FWS can complete consultations sooner and identify any changes to protections that may be needed to either better protect listed species or relieve the burden of unnecessary restrictions.

¹ In this document, EPA defines "mitigation" as a measure or group of measures that reduces pesticide exposures to non-target exposures. EPA commonly uses mitigations to address potential ecological impacts identified under FIFRA and are also used to address impacts to ESA listed species. EPA applies this term to all FIFRA actions, ESA Section 7(a)(1) and 7(a)(2). Mitigations may include avoidance, minimization, and offsets.

In addition to the multi-chemical approaches, EPA is developing various communication and education materials to support and enhance implementation of mitigations and facilitate compliance. EPA expects its approaches to evolve over time through lessons learned and as new information become available. Where resources allow, there may be opportunities where research efforts of EPA's Office of Research and Development may help improve the scientific basis of OPP's approaches. Also, research conducted by other federal agencies, stakeholders or academics may be considered in the future. EPA is also considering ways to provide data used in its approaches and ESA assessments to the public and improve access to information, transparency and improve implementation (*e.g.*, making listed species life history and geospatial location and crop data available). EPA's multi-chemical approaches, communication, education, and research efforts are intended to streamline consultations and more quickly advance species recovery by implementing landscape-level mitigations that help reduce pesticide exposures.

EPA has already finalized some of its multi-chemical approaches with input and collaboration of FWS (*i.e.*, the final Herbicide Strategy and the Vulnerable Species Action Plan). EPA has also drafted strategies for Insecticides, Rodenticides and for pesticides used in Hawaii. EPA continues to develop other approaches to identify mitigations to reduce pesticide exposures and impacts and continues to engage in various efforts to implement these approaches and advance their scientific basis. Some approaches are more clearly conceptualized and represent commitments from EPA. Other efforts are still being explored by EPA and may be developed be developed as resources allow.

1. Introduction

The mission of EPA is to protect human health and the environment. OPP contributes to achieving EPA's mission through regulation of pesticides. OPP regulates the sale, distribution, and use of pesticides under the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA)² and the Federal Food, Drug, and Cosmetic Act (FFDCA). Pesticides include insecticides, herbicides, rodenticides, disinfectants, sanitizers and more. Pesticides may be considered conventional³, antimicrobial⁴ or biopesticides⁵. This plan focuses on conventional pesticides. EPA decides whether to grant or deny an application to register pesticide products containing new active ingredients, new pesticides containing already registered active ingredients, new uses of currently registered pesticides, and reevaluates existing registered pesticides every 15 years as part of a reevaluation process. In addition to EPA's obligations under FIFRA and FFDCA to regulate pesticides, EPA also has obligations under the ESA (*i.e.*, Sections 7(a)(1) and 7(a)(2) quoted in the Executive Summary).

²This also includes several amendments to FIFRA made through successive versions of the Pesticide Registration Improvement Act.

³ Conventional active ingredients are generally produced synthetically (*i.e.*, synthetic chemicals that prevent, mitigate, destroy, or repel a pest or that act as a plant growth regulator, desiccant, defoliant, or nitrogen stabilizer).

⁴ Antimicrobial pesticides are intended to disinfect, sanitize, reduce, or mitigate growth or development of microbiological organisms or protect inanimate objects, industrial processes or systems, surfaces, water, or other chemical substances from contamination, fouling, or deterioration caused by bacteria, viruses, fungi, protozoa, algae, or slime.

⁵ Biopesticides are certain types of pesticides derived from such natural materials as animals, plants, bacteria, and certain minerals. Biopesticides fall into three major classifications: Biochemical, Microbial, and Plant-Incorporated Protectants.

In 2022, EPA released a workplan to describe the Agency's thinking on how to create a sustainable ESA-FIFRA program⁶ so that EPA can meet its obligations under ESA, typically achieved through consultation with the Services (FWS and the National Marine Fisheries Service). EPA also released an update to the workplan that provided additional details on EPA's plan for addressing its ESA obligations. EPA's 2022 workplan and update provide background information on EPA's challenges and thinking behind the goals and approaches that are described in this document. Within those documents, EPA described its interest in developing a plan to further improve on its section 7(a)(1) and 7(a)(2) obligations. Since the workplan and its update were released, EPA has worked with FWS to develop this plan for further promoting the recovery of listed species and streamlining consultations. This plan involves many of the approaches described in the workplan. Since the workplan and its update, EPA has advanced its thinking on many of these approaches and has established a clearer plan on how these approaches help advance the recovery of species and how they can be used to improve the efficiency of consultations. This plan reflects EPA's current thinking on its approaches related to ESA obligations (this represents another update to the contents of the workplan). This conservation plan addresses all federally listed endangered and threatened ("listed") species and critical habitats under the authority of FWS⁷. EPA has worked with FWS throughout the development of this plan. This plan is the basis for an interagency agreement between EPA and FWS under ESA sections 7(a)(1) and 7(a)(2) (Interagency Memorandum of Understanding).

EPA developed this plan to further promote species recovery and streamline 7(a)(2) consultation to address multiple needs, including:

- Working to reduce the threat of pesticide exposure to listed species through the timely implementation of mitigations (conservation practices) that keep pesticides on the application site, thus improving the baseline⁸ condition of many listed species and furthering their recovery;
- Creating an efficient 7(a)(2) consultation process that can be applied with current EPA and FWS staff levels and resources;
- Creating a more transparent, consistent, and predictable ESA process for stakeholders. These needs are discussed in the following paragraphs.

At this time, there are hundreds of conventional pesticide active ingredients registered for use in the United States. In 2011 and 2012, approximately 1 billion lbs of pesticides were applied in the US, with approximately half of that usage attributed to herbicides. From 2005-2012, the majority (~90%) of pesticide usage was on agricultural sites, with 10% of usage on home and garden and industrial, commercial and government sites.⁹ In the US and its territories, FWS is responsible for over 1600 listed species and over 700 critical habitats. These species differ by location, taxonomy, and pesticide exposures. When FWS considers a species for listing and identifies recovery goals for listed species, FWS identifies stressors that may be impeding the conservation or recovery of that species. The most common causes of stressors to species include loss of habitat and competition from invasive species.

⁶ The workplan and workplan update can be found at: https://www.epa.gov/endangered-species/epas-workplanand-progress-toward-better-protections-endangered-species

⁷ All species under the sole authority of NMFS, which is approximately 80 species, will be addressed through a different effort.

⁸ Environmental baseline - the past and present impacts of all Federal, State, or private actions and other human activities in an action area, the anticipated impacts of all proposed Federal projects in an action area that have already undergone formal or early section 7 consultation, and the impact of State or private actions that are contemporaneous with the consultation in process. [50 CFR §402.02]

⁹ https://www.epa.gov/sites/default/files/2017-01/documents/pesticides-industry-sales-usage-2016_0.pdf

Pesticides in general or specific types of pesticides have been identified as stressors for hundreds of listed species (USFWS 2022)¹⁰. Therefore, pesticide exposures and impacts may be part of the baseline of listed species. EPA is working on approaches that are intended to reduce pesticide exposures, resulting in a reduction of the potential impacts to listed species which is expected to help improve the baseline condition of listed species. This will further the conservation of hundreds of listed species. FWS guidance¹¹ indicates that a conservation plan "should be aligned with and informed by the most recent and relevant recovery plans, 5-year reviews, conservation strategies, species status assessments and other documents." It is challenging to explicitly connect the dots between all of the multi-chemical approaches in EPA's plan to the hundreds of listed species that are expected to benefit from this plan. Therefore, this document includes two appendices with species-specific examples (for the Rusty Patched Bumble Bee and San Joaquin Kit Fox) that illustrate how approaches described in this plan connect to the goals of FWS recovery plans.

EPA's historical focus has been to identify and implement mitigations directed at protecting listed species through 7(a)(2) consultations. This has been an inefficient process which takes many years and many staff from EPA and FWS to carry through to the end. At the current rate and resource levels, it would take EPA and FWS decades to fully assess potential impacts to over 1600 species under FWS authority and implement pesticide mitigations for all currently registered pesticides. As discussed in EPA's 2022 workplan, EPA is currently meeting its 7(a)(2) ESA obligations for only a subset of its pesticide-related actions. EPA is revising its approach to addressing its ESA obligations by using a more efficient tiered approach that includes both proactive conservation of many species through the restriction of groups of pesticides and mitigation of specific species impacts for individual pesticide active ingredients or groups of pesticides through consultation. With this approach, EPA and FWS can consult under both 7(a)(1) and 7(a)(2). This could include the development of broad landscape scale approaches that can benefit many species within the US. These broad landscape-scale approaches can group species, EPA assessment approaches and mitigation options to efficiently and consistently identify mitigations relevant to a pesticide (e.g., based on its uses and potential impacts) that can help reduce impacts of that pesticide on many listed species. EPA has been developing approaches as discussed above that include mitigations that could apply to FIFRA actions, as appropriate. Approaches that promote the recovery of species would be incorporated into actions before 7(a)(2) consultation begins, thereby allowing 7(a)(2) consultations to focus on any remaining concerns specific to the pesticide. With this tiered approach, the EPA approaches will serve as a conservation filter where, by promoting recovery, pesticide impacts to many species may be reduced, leaving a limited number of remaining impacts to focus upon in a streamlined 7(a)(2) consultation. This approach will allow EPA and FWS to more efficiently use their available resources to maximize protections of listed species that may be affected by pesticides in a timely manner. Figure 1 depicts how EPA envisions incorporating the approaches into registration review decisions and how this could help streamline section 7(a)(2)consultations because mitigations could be incorporated into the action prior to initiating or completing any necessary consultation. In many cases, each step of the registration review process can take months to years to get to a final registration review decision. EPA expects that this plan between the agencies could make many of these steps more efficient, especially completing any necessary ESA section 7(a)(2)

¹⁰ USFWS. 2022. Biological and Conference Opinion on the Registration of Malathion Pursuant to the Federal Insecticide, Fungicide, and Rodenticide Act. February 28, 2022. U.S. Fish and Wildlife Service. Ecological Services Program.

¹¹ USFWS. 2018. Better conservation more efficiently: a guide for federal compliance with Section 7(a)(1) of the Endangered Species Act. US Fish and Wildlife Service, Northeast Region. January 31, 2018. Available online at: https://www.fws.gov/sites/default/files/documents/508_R5-7a10-Guidance.pdf

consultation. Throughout this process, EPA provides for multiple opportunities for input from the public through comment periods. The feedback EPA receives could inform recovery actions, assessments and mitigations considered by EPA and FWS.

EPA believes that a more transparent, consistent, and predictable FIFRA-ESA process is needed for stakeholders. EPA is developing multi-chemical approaches based on groups of pesticides, uses or species through approaches as discussed in the workplan and in this document. That way, a level playing field can be applied to pesticides that have uses or listed species in common. By establishing a process that can be implemented sooner, potential impacts of groups of pesticides will be mitigated within a number of years, instead of decades. EPA has been releasing its draft multi-chemical approaches for public comment, allowing stakeholders the opportunity to review and provide input before these approaches are finalized and used to inform registration and registration review decisions. As resources allow, EPA also plans to incorporate other activities, such as education and research.

Registration Review Final Work Plan and Data Call In

Problem formulations
Data needs identified
Public comment period on proposed workplan

FIFRA and FFDCA Assessments

- Human health risks
 Ecological risks
 - Benefits, impacts and
 - alternatives
 - Public comment period on assessments
- Labels revised, bulletins may also be developed
 - Further recovery and conservation of species (ESA 7(a)(1))

Interim Decision

standards, including IEM

• Public comment period on

proposed interim decision

• Implement relevant final

• Address risks based on

FIFRA and FFDCA

ESA strategies

ESA Consultation

- EPA conducts Biological Evaluations (BEs)
- Services conduct Biological Opinions (BiOps)
- Public comment periods on draft BE and BiOps
- BEs, BiOps and 7(a)(2) consultation are streamlined because strategies are already
- incorporated into actions • Identify additional or
- changes to mitigations

Final Decision

- Labels revised, bulletins may also be developed
- Address ESA 7(a)(2) obligations through implementation of mitigations in BiOp

Figure 1. Tiered approach where approaches are incorporated into registration review of specific pesticides (individual or groups). The application of pesticide multi-chemical approaches early in the process allows EPA to further the recovery and conservation of species and streamline section 7(a)(2) consultations.

2. Goals and Approaches to Achieve Goals

EPA's two major goals are to 1) help further the conservation and recovery of listed species by ensuring the actions undertaken in the approaches help address pesticide-related recovery priorities as identified in Service documents and generally reducing pesticide exposures and potential resultant impacts to listed species¹² and 2) streamline 7(a)(2) consultations by incorporation of these conservation actions. EPA plans to accomplish these goals by proactively decreasing exposures at a landscape scale to help address pesticide related threats to listed species and thus, during 7(a)(2) consultation, reduce the likelihood of jeopardy or adverse modification. To achieve EPA's goals, EPA is developing multi-chemical approaches that identify mitigations by pesticide type, use, location, and species. EPA is working with FWS to identify mitigations that can be used to reduce pesticide exposures so that population-level impacts are not likely. For pesticides that are currently used, implementation of these multi-chemical approaches is expected to reduce the impact of pesticide exposure and help improve the baseline condition (contribute to the recovery) of many listed species. For registration and registration review decisions associated with new and currently registered pesticides, this will result in practices in place earlier in the process that reduce potential exposure of listed species to pesticides, thus streamlining the 7(a)(2) consultation process. EPA's practices to reduce pesticide exposure to listed species are based on best available scientific information. EPA will continue its public outreach to stakeholders to facilitate implementation of these multi-chemical approaches and to increase awareness of listed species that may be impacted by pesticide use and the measures that may be necessary to reduce these impacts. EPA is identifying opportunities to support and improve the multi-chemical approaches and their links to species recovery over time through research when resources allow. In the future, EPA also plans to improve implementation by improving efficiency of reviewing and updating labels (electronic labels), use of a website with mitigations and Bulletins Live! Two. The connections between these multichemical approaches and efforts and how they contribute to EPA's goals are depicted in Figure 2 and explained in sections below.

¹² This may include addressing pesticide related threats identified by FWS for specific species (*e.g.*, FWS identified pesticides as a stressor for rusty patched bumble bee).



Figure 2. Overview of how the EPA's approaches contribute to the recovery of listed species and streamlined consultation.

EPA has already finalized some of its multi-chemical approaches with input and collaboration of FWS (*i.e.*, the final Herbicide Strategy and the Vulnerable Species Action Plan). EPA continues to develop other multi-chemical approaches to identify mitigations to reduce pesticide exposures and impacts and continues to engage in various efforts to implement these approaches and advance their scientific basis. During development of the approaches, EPA has worked and continues to work with FWS and USDA. EPA expects to seek FWS feedback on listed species and designated critical habitats, USDA feedback on reasonable, implementable mitigations, and feedback from both Agencies on the effectiveness of mitigations in protecting listed species. Both Agencies also provide important data sources such as the Census of Agriculture and crop location information from the Cropland Data Layer and species life history information, statuses, and locations. EPA expects the multi-chemical approaches to evolve and improve over time, allowing for incorporation of new research and information.

Some multi-chemical approaches and communication/education and research/information/data support are more clearly conceptualized and represent commitments from EPA. Other approaches are being explored by EPA. For approaches and supporting efforts that EPA will definitively pursue, this document uses "will" or other affirmative language. For approaches and efforts that EPA cannot yet commit to, this plan uses "expects," "is considering," or other equivocating words. This plan thus contains a mix of definitive and aspirational actions. EPA will consider various approaches and supporting efforts as resources allow.

3. Multi-Chemical Approaches

EPA is continuing to develop a series of multi-chemical approaches, including several strategies and other plans and efforts. The Term "Approach" refers to an EPA effort to account for the characteristics of pesticides and identify landscape-scale mitigations, as appropriate, based on location, pesticide class, species or use site. Some of the approaches discussed below have been or are currently under development by EPA, with input from FWS. These approaches will inform EPA's registration and registration review decisions when addressing population-level exposures and impacts relevant to listed species. EPA's approaches are expected to result in a substantial improvement to the efficiency of mitigating and consulting on pesticides, resulting in recovery actions being implemented sooner and at a landscape scale.

FWS has authority over the majority of listed species including plants, insects, mussels, fish, birds, mammals, reptiles, and amphibians. These species are diverse in their life history, locations, and potential for pesticide exposures. However, many species can be grouped in terms of what types of impacts may be expected from types of pesticides and the types of mitigations to address those impacts. Pesticide impacts to a given species may vary based on its life history (*e.g.*, diet, migration). Pesticide uses and potential impacts also vary across the U.S. based on crops grown, non-agricultural use sites (*e.g.*, forestry, residential areas) and associated pest pressures. For example, pesticide usage in the contiguous U.S. (CONUS) is much different than in Hawai'i. Pesticide impacts vary from pesticide to pesticide, with unintended survival, growth or reproductive effects to non-target animals and plants (*e.g.*, a particular herbicide may cause reproductive effects to fish, multiple insecticides with the same mode of action may decrease survival in birds). Often classes of pesticides have similar impacts, especially considering their target pests (*e.g.*, rodenticides may impact non-target mammals, herbicides may impact non-target plants). The various approaches are intended to account for the characteristics of the individual pesticide and identify landscape scale mitigations, as appropriate, based on location, pesticide class, species or use site (**Table 1, Figure 3**). Grouping species or pesticide uses based on their

similarities will allow EPA to more efficiently and effectively identify and implement mitigations at a landscape scale through FIFRA registration and registration review actions. This will allow EPA to further its goals to reduce pesticide exposures and impacts to listed species, further the conservation of listed species, and streamline 7(a)(2) consultations on specific actions. EPA plans to implement the approaches as they become final. The final approaches will inform registration and registration review decisions.

By "landscape," we refer to an area that includes ecosystems or habitats containing multiple listed species populations and a set of pesticide uses that generally have similar practices, impacts and mitigations¹³. The scale of the landscape of a given approach may differ. For example, some multi-chemical approaches are focused on mitigations in agricultural pesticide uses in the conterminous US and specific taxa while the Hawai'i Strategy includes agricultural and non-agricultural pesticide uses and species that occur in the state of Hawai'i. Grouping species or pesticide uses based on their similarities will allow EPA to efficiently identify and implement mitigations at a landscape scale. This will allow EPA to further its goals to reduce pesticide exposures and impacts to listed species, further the conservation and recovery of listed species and streamline 7(a)(2) consultations on specific actions.

| Multi-chemical Approach | Location | Use site | Conventional | |
|---|--------------------|---------------------|------------------------|--|
| | | | pesticide type | |
| Finalized, currently under development or EPA has committed to develop | | | | |
| Interim ecological | US and territories | Agriculture | All | |
| mitigations | | | | |
| Herbicide Strategy | CONUS | Agriculture | Herbicides | |
| Insecticide Strategy | CONUS | Agriculture | Insecticides | |
| Rodenticide Strategy | US and territories | All | Rodenticides | |
| Fungicide Strategy | CONUS | Agriculture | Fungicides | |
| Vulnerable Species Action | CONUS | Agriculture | All | |
| Plan | | Mosquito adulticide | | |
| | | Rights of Way | | |
| | | Forestry | | |
| | | Rangeland | | |
| Hawai'i Strategy | Hawai'i | All | All | |
| Offsets | CONUS | All | All | |
| EPA is considering these approaches for future development as resources allow | | | | |
| Non-agricultural – mosquito | CONUS | Various | Subset of insecticides | |
| adulticide Strategy | | | | |
| Non-agricultural –residential | CONUS | Various | All | |
| Strategy | | | | |
| Avicide Strategy | US and territories | All | Avicides | |
| Territory Strategy | Territories | All | All | |

Table 1. Summary of multi-chemical approaches that are currently being developed or EPA is considering.

CONUS = contiguous US

¹³ USFWS. 2023. Mitigation Policy Appendix 1, 501 FW 2. May 10, 2023. Available online at: https://www.fws.gov/sites/default/files/policy/pdfs/FWS-Mitigation-Policy.pdf



Figure 3. Multi-chemical approaches EPA is currently developing or is considering as resources allow for grouping actions or species to efficiently identify and implement mitigations. Numbers of species and Critical Habitats (CH) are approximate. Approach names in italics.

3.1 Agricultural uses of herbicides, insecticides, and fungicides in the coterminous US

EPA is developing multiple strategies that are focused on classes of conventional pesticides that are used on agriculture. EPA has developed a final Herbicide Strategy¹⁴ and a draft Insecticide Strategy¹⁵. The purpose of the Herbicide Strategy is to reduce pesticide exposures and associated population-level impacts that are attributed to impacts to plants (both direct impacts to listed plants and impacts to species that depend on plants for diet and habitat). Similarly, the purpose of the Insecticide Strategy is to reduce pesticide exposures such that population-level impacts that are attributed to invertebrates and impacts to species that depend on invertebrates (both direct impacts to listed invertebrates and impacts to species that depend on invertebrates for diet or pollination) are avoided. These strategies are a priority because these types of pesticides represent the majority of currently registered pesticide applications. Mitigating impacts to plants and insects from these pesticides throughout CONUS is expected to contribute to recovery of hundreds of listed species that are plants or invertebrates or depend upon them for food or habitat.

EPA acknowledges that these pesticides may lead to additional non-target effects (*e.g.,* indirect effects, effects to mammals). Therefore, EPA expects to consider effects of these pesticides during 7(a)(2) consultation. These consultations will be streamlined because mitigations will already be identified through the strategies to address population-level impacts associated with impacts to plants from herbicides or impacts to invertebrates from insecticides. That will allow the consultation to focus on other non-target effects not covered by these strategies. The consultation can also focus on other uses (*e.g.,* non-agricultural) or locations (outside of CONUS) not covered by the Herbicide or Insecticide Strategies.

In addition to the Herbicide and Insecticide Strategies, EPA has committed to develop a strategy for fungicides used on agricultural sites located in CONUS. Fungicides have a wide variety of modes of action and impacts to non-target taxa. This differs from the Insecticide and Herbicide Strategies where the most common effects are to taxa that are similar to the target pests (*i.e.*, effects to insects and plants, respectively). EPA expects to group fungicides where possible based on similarity of impacts and mitigations. EPA also expects to apply lessons learned from the development of the Herbicide and Insecticide Strategies.

EPA has also identified a suite of Interim Ecological Mitigations (IEM)¹⁶ that it intends to include in regulatory actions for agricultural pesticide uses, as appropriate, to address the ecological risks of a pesticide. These mitigations are specific to the exposure routes (*e.g.*, spray drift, runoff, erosion) leading to the identified ecological risks and are based on the fate and transport characteristics of the pesticide and the toxicological effects, risks, and benefits of the pesticide. The FIFRA IEMs are intended to raise the baseline for ecological mitigation measures, and EPA established a consistent approach for applying them to reduce ecological risks across pesticides. The IEM differs from the Herbicide and Insecticide Strategies discussed above in that those strategies are intended to address population-level impacts to listed species while the IEM is intended to reduce ecological risk concerns for non-target organisms, with consideration of the benefits of the pesticide (this does not necessarily address population-level impacts

¹⁴ https://www.epa.gov/newsreleases/epa-finalizes-first-its-kind-strategy-protect-900-endangered-speciesherbicides

¹⁵ https://www.epa.gov/newsreleases/epa-releases-draft-strategy-better-protect-endangered-species-insecticides ¹⁶ https://www.epa.gov/pesticides/epa-advances-early-pesticides-protections-endangered-species-increasesregulatory

for listed species). In addition to FIFRA IEM, mitigations required to address a human health concern, such as reductions in pesticide application rates or use prohibitions, could also lead to reducing exposures to nontarget species, including listed species.

EPA has developed a menu of mitigations relevant to agricultural uses of conventional pesticides. The objective of this menu is to ensure that applicators have flexibility in how they achieve the goal of reducing pesticide exposures, using mitigation measures that are effective. This menu is designed to be part of the final Herbicide Strategy, draft Insecticide Strategy and possibly the Fungicide Strategy (that has not yet been developed) and the FIFRA IEM. This menu includes a suite of standard measures that EPA has identified that are effective for reducing spray drift and runoff/erosion. EPA plans to use the mitigation menu for agricultural uses of conventional pesticides across different classes of pesticides (*e.g.*, herbicides, insecticides). EPA expects to update this menu over time as information becomes available to add more mitigation measures. EPA believes that this mitigation menu helps present a consistent set of mitigations that are applicable to reducing pesticide transport to non-target areas and can be used by pesticide applicators regardless of when and how EPA identifies a need for mitigation. EPA expects to this menu.

3.2. Rodenticides and Avicides used throughout the US

Rodenticides are a unique group of pesticides because of their target pests (mammals, most often rodents), fate and effects (exposures of concern are from direct consumption of bait and sometimes from consumption of contaminated prey), and application methods (bait boxes, in burrow or broadcast of bait). Therefore, rodenticides have unique mitigations and species of concern compared to other types of pesticides. The Rodenticide Biological Evaluation (BE) includes all 11 rodenticides that are going through registration review¹⁷; EPA has released a draft version of the BE for public comment¹⁸. EPA will finalize the BE in November 2024 and initiate consultation as appropriate. The scope of the Rodenticide BE applies to all uses of these rodenticides (agricultural and non-agricultural) throughout the US and its territories. As part of the Rodenticide Strategy, EPA is proposing mitigations to avoid the predicted potential likelihood of future jeopardy and adverse modification for any species where this is likely. EPA intends to incorporate all mitigations into the registration review process for the 11 rodenticides. EPA also expects that this strategy will help further conserve and recover species where rodenticides are currently a stressor by reducing exposures and subsequent impacts on individuals or the population. This Strategy will serve to streamline 7(a)(2) consultation because 11 active ingredients are being assessed at the same time and mitigations are being proposed. Based on the draft BE, EPA expects to initiate consultation with FWS when the BE is finalized. EPA anticipates that the Rodenticide BE will be a programmatic consultation with FWS because this consultation will apply to 11 rodenticides.

EPA may develop an approach for the avicides as resources allow. Avicides are also a unique group of pesticides that are targeted for birds. Similar to rodenticides, avicides are applied as baits. After EPA completes the Rodenticide BE, EPA anticipates adapting mitigations described therein to the avicides as appropriate. There may be additional limitations on the use of avicides due to permitting requirements

 ¹⁷ Specifically: chlorophacinone, diphacinone and its sodium salt, warfarin and its sodium salt, brodifacoum, bromadiolone, difenacoum, difethialone, bromethalin, cholecalciferol, strychnine, and zinc phosphide
 ¹⁸ https://www.epa.gov/pesticides/epa-releases-draft-biological-evaluation-11-rodenticides-effects-endangered-species

and restrictions under the Migratory Bird Treaty Act, which would be considered and incorporated as part of EPA's Avicide Strategy approach.

3.3. Vulnerable Species Action Plan

Consistent with the Agency's April 2022 Pesticide ESA Workplan, EPA released the Draft Vulnerable Species Pilot white paper on June 22, 2023¹⁹. In the draft VSP white paper, EPA identified 27 listed species that are vulnerable to pesticides, identified mitigation to protect them by minimizing or avoiding pesticide exposure and described an approach to implement the mitigation in certain future pesticide decisions. EPA took public comment on the pilot. This white paper also included EPA's thoughts on possible expansion of the pilot to other Vulnerable Species. EPA's goal is to proactively reduce the potential for population-level impacts to these listed species and their critical habitats. For each species, EPA identified geographically specific mitigation using pesticide use limitation areas (PULAs) to indicate where the mitigation would apply, including for agricultural and several non-agricultural uses of conventional pesticides. EPA subsequently issued an update to the Pilot²⁰ that provided additional detail on the major themes in the public comments and potential changes to the identified mitigations.

EPA released the final Vulnerable Species Action Plan (VSAP) in September 2024²¹. The VSAP defines a vulnerable species as a listed species that is particularly vulnerable to pesticides due to a combination of factors including a declining population trend, small number of individuals or small number of populations (e.g., groups of individuals or sub-populations), limited distribution (e.g., endemic, constrained and/or isolated populations), and occurrence in areas that may be exposed to pesticides. The VSAP applies a three-step framework, which builds off the herbicide and insecticide strategies and is intended to provide similar mitigations for the vulnerable species for pesticides with similar characteristics (e.g., exposure, toxicity, application method). There are 27 species currently in the VSAP. EPA will consider expanding the species included in this Action Plan through consultation or coordination with FWS.

3.4. Hawai'i and Territories

EPA is currently developing a mitigation strategy for most uses of conventional pesticides used in Hawai'i. The purpose of the Hawai'i Strategy is to identify when mitigations are needed to avoid population-level impacts to listed species in Hawai'i. Over 500 of the currently listed species (40% of all listed species) occur only in Hawai'i. Pesticide exposures to listed species in Hawai'i are unique due to pesticide use patterns, factors that influence pesticide transport (*e.g.*, topography, natural landcovers) and locations of species (including their occurrence on protected or managed lands). Additionally, the need to control invasive species, that pose a significant threat to listed species, sometimes require the use of pesticides. Therefore, considering all species in Hawai'i in one strategy will allow EPA to account for these unique conditions, identify what species and areas may or may not need mitigations for pesticides and determine what mitigations make sense for the use patterns in Hawai'i. The Hawai'i Strategy involves identifying which species may be exposed to pesticides and where the exposure may occur. Then, mitigations would be identified for those species where pesticide exposure is a concern.

¹⁹ https://www.regulations.gov/document/EPA-HQ-OPP-2023-0327-0002

²⁰ https://www.epa.gov/pesticides/epa-publishes-update-vulnerable-species-pilot

²¹ https://www.epa.gov/pesticides/epa-finalizes-plan-protect-vulnerable-species

EPA may develop an approach for US territories as resources allow. After the Hawai'i Strategy is complete, EPA may follow a similar approach for species in the US territories. This may involve grouping species located within the same territory (*e.g.*, Puerto Rico has approximately 70 species) or on groups of territories that have similar species characteristics or necessary mitigations (*e.g.*, Pacific islands have approximately 60 species, Caribbean Islands have approximately 90 species).

3.5. Non-agricultural uses of pesticides in the contiguous US

EPA may develop approaches for the non-agricultural uses, specifically mosquito adulticides and residential areas, as resources allow. Within CONUS, there are a variety of non-agricultural uses of pesticides. EPA is currently considering developing strategies that focus on development of mitigations for various non-agricultural uses of pesticides. Non-agricultural uses vary substantially by spatial extent, species likely exposed, application methods and likely exposure routes. Non-agricultural uses also vary substantially by relevance to human health and ecological conservation (*e.g.*, mosquito adulticides and larvicides, flea and tick products, termiticides, products to control invasives, and other products that are important enough to require efficacy data to protect consumers).

3.6. Offsets

Many of the strategies described above focus on mitigations that minimize exposure and impacts. At times, federal agencies have used offsets to meet ESA obligations (also known as compensatory mitigation) to address the impacts of their actions that cannot be avoided or minimized. Offsets are considered after feasible avoidance and minimization measures have been exhausted but more is needed to protect species. This could include actions such as habitat preservation or restoration, invasive species control, and species reintroductions. These actions can directly further species recovery (sometimes more than on-site avoidance and minimization) and can provide even greater flexibility by creating more options to meet ESA obligations. EPA plans to identify opportunities for offsets to complement traditional avoidance and minimization measures for pesticides. Although a process still needs to be developed, EPA plans to do so through a multi-step process that would include working with FWS. EPA is considering opportunities to encourage habitat creation and incorporate offsets into its mitigation approach (*e.g.*, applicators may have less minimization requirements in cases where habitat has been created for a species).

4. Support for Multi-Chemical Approaches

4.1. Communication and Education

EPA's plan for further conservation of listed species and streamlining consultations represents a change in the way it typically operates. EPA realizes that communication with stakeholders during development and implementation of the strategies to inform its registration and registration review processes is a critical aspect of the success of this plan.

EPA has been and will continue to share information with stakeholders and solicit stakeholder feedback during the development of the approaches through various venues. EPA will engage its co-regulators, states and tribes, throughout development and implementation of the approaches. EPA may also

collaborate with specific state agencies when applicable to an approach (*e.g.*, Hawai'i), or with state lead agencies when appropriate.

EPA has been and will continue to share information with stakeholders and solicit stakeholder feedback during the development of the strategies through various venues. As part of that communication, EPA will increase awareness of the need to reduce threats to listed species from pesticide exposure by proactively reducing such exposures. EPA is also considering communicating about the need and benefits of conserving and recovering listed species. EPA has developed websites^{22,23} and communications to update stakeholders on its ESA strategies. Formally, EPA will continue to provide draft approaches for public comment. Information from stakeholders, including grower groups, non-agricultural pesticide user groups, environmental groups, registrants, and pesticide applicators will help EPA identify existing best practices and approaches that pesticide users are already employing and also to identify workable approaches to reduce pesticide exposure to listed species. As EPA begins to implement final strategies to inform its registration and registration review processes, EPA will again solicit comment when the Agency proposes certain decisions for registration or registration review of specific pesticides and/or products.

EPA is developing various communication and education materials that are intended to support awareness of any new label requirements, particularly those resulting from registration review. Because pesticide users may have been using these products for several years or decades, awareness of any changes in how these pesticides may be used is key to their ability to comply. EPA has developed or is planning to create various educational materials, including handouts, presentations, webpages, dashboards, and informational webinars. EPA also recognizes that the main sources of information for many growers/pesticide users are the States, crop consultants, extension agents, and pesticide distributors and EPA wants to improve grower/pesticide user awareness. EPA believes that providing the appropriate support materials to the professionals that advise pesticide applicators will help improve compliance with label restrictions, including Bulletins, and thus help decrease pesticide exposures to listed species.

4.2. Research, Information and Data

EPA values research from the scientific community, including research conducted within the Agency and by USDA and academia. EPA expects research efforts by the scientific community to advance the underlying foundation of the multi-chemical approaches. EPA is engaging in several efforts related to research, that can support and improve the science of the practices outlined in the strategies in order to ensure their connection to furthering species recovery. OPP is currently working with the EPA Office of Research and Development (ORD) on several projects to address key scientific questions associated with OPP's assessments or mitigations. For example, ORD's research plan includes ecotoxicological and assessment and modeling projects related to listed species.²⁴

²² https://www.epa.gov/endangered-species/implementing-epas-workplan-protect-endangered-and-threatened-species-pesticides

²³ https://www.epa.gov/endangered-species/implementing-epas-workplan-protect-endangered-and-threatened-species-pesticides#species

²⁴ https://www.epa.gov/system/files/documents/2022-10/CSS%20FY23-26%20StRAP_EPA-ORD_October%202022_508.pdf

As described above, EPA has developed a mitigation menu for spray drift and runoff/erosion mitigations that can be used to reduce pesticide exposures and impacts to listed species. EPA expects this menu to evolve over time as more information becomes available on the effectiveness of different practices. If additional information is available in the scientific literature or from government researchers, EPA will consider those data for potential improvements to the mitigation menu. EPA and USDA plan to work together to identify and find ways to address information needs in mitigation effectiveness.

The approaches described above, EPA's BEs, and FWS's Biological Opinions rely heavily on listed species information, including data. This information includes species life history, vulnerability, and location. EPA has compiled a database of information obtained from FWS sources that is used in its BEs. EPA plans to update this database as approaches are developed and as BEs and BiOps are completed. EPA will work with FWS to ensure that they agree with the species-specific information in the database, which may involve soliciting the feedback of FWS species experts. EPA plans to make the database available to FWS staff. EPA will include information that is used by EPA and FWS to streamline the consultation process so that one database is used for the entire consultation process. With this database, EPA will identify species-specific data gaps that are impactful to the pesticide risk assessments and BEs. These data gaps may be an opportunity for stakeholders, including researchers, to provide important species-specific information that is needed by EPA and FWS for consultation and can be helpful to furthering the recovery of the species.

EPA has made the geographic data used to support strategies and to conduct ESA assessments for pesticides, publicly available for the first time via interactive maps²⁵. The maps and underlying data that EPA has released support the Agency's broader efforts to improve protections for federally threatened or endangered (listed) species and increase transparency in EPA's pesticide review process. The datasets include species range and designated critical habitat locations as well as EPA's Use Data Layers. These data may be viewed on interactive dashboards or downloaded for use in Geographic Information Systems. EPA may continue to develop additional dashboards to help advance transparency of the data used in its assessments and approaches. This transparency may help stakeholders identify opportunities where additional species-specific data or refinements may be helpful to improve the information available for a listed species.

4.3. Improving Implementation through Labels and Bulletins Live! Two

EPA is working to modernize its internal technology and infrastructure to improve the efficiency of implementing mitigations. Mitigations are implemented through pesticide labels. EPA also links the labels to other EPA websites, including a mitigation menu²⁶ and through the Bulletins Live! Two (BLT²⁷) system. These websites become enforceable through directing the user to the website. By providing mitigations on a menu, EPA can update mitigations over time as new information becomes available. EPA is continuing to maintain and enhance the BLT system so that pesticide users can access relevant mitigations. Bulletins set forth geographically specific pesticide use limitations for the protection of threatened and endangered (listed) species and their designated critical habitat. EPA expects to use bulletins and BLT to implement some of the mitigations included in the strategies discussed above. Also,

²⁵ https://www.epa.gov/endangered-species/advancing-transparency-endangered-species-act-evaluationsthrough-publicly

²⁶ https://www.epa.gov/pesticides/mitigation-menu

²⁷ https://www.epa.gov/endangered-species/endangered-species-protection-bulletins

EPA is working to modernize its label system so that labels can be submitted and reviewed electronically.

If EPA identifies geographically specific mitigations to protect listed species from the use of a pesticide (or group of pesticides), EPA may communicate those mitigations and where they apply using BLT. The locations where those mitigations apply are called Pesticide Use Limitations Areas (PULAs). Thus, the purpose of a PULA is to identify areas where pesticide mitigations apply to conserve a listed species and its critical habitat (if designated). PULAs focus on areas where pesticide exposures are likely to impact the continued existence of a listed species, which may include a reduction in survival or recovery of the species. Thus, PULAs are intended to focus mitigations to where they are needed to protect populations. EPA is currently working with FWS, USDA and stakeholders to develop a transparent process for using best available species information (which is captured in the database discussed above) to develop PULAs for listed species. These PULAs may be used for the multi-chemical approaches as well as to implement mitigations identified through 7(a)(2) consultations.

5. Adaptive Management

To advance the goals of this plan, it is necessary for EPA to develop, finalize and implement the approaches described above to promote listed species recovery. EPA and FWS expect to continue to work together in the development of each of these approaches. The desired outcome of this collaboration is to finalize approaches where EPA and FWS agree that the approaches achieve their stated purposes and EPA's overall conservation goal. FWS will also work with EPA to develop a streamlined 7(a)(2) consultation process that incorporates the final approaches.

EPA is currently developing methods for evaluating the effectiveness of its approaches in recovering listed species and in streamlining consultations. These methods may include tracking the number of ESA assessments and decisions that include mitigations and tracking the amount of time and resources saved by implementation of these strategies. EPA is also considering ways to track the adoption of mitigation practices. In addition, EPA is considering methods to evaluate the relationship between pesticide exposures and impacts to species.

This document includes EPA's current thinking on approaches to further conserving listed species and streamlining consultations. EPA anticipates that modifications to the above approaches may be made as experience is gained. EPA may also consider expanding, modifying, or adding approaches to address species after they are listed in the future. For example, if an existing approach is expected to provide sufficient protections for a newly listed species, that species could be included in that approach (*e.g.*, a plant in CONUS that may be exposed to pesticides from agriculture could be included in the Herbicide Strategy). If a future listed species is not expected to be covered by multi-chemical approaches that are final at the time or planned for development, EPA will consider how to address that newly listed species through modifications to its approaches or addition of new approaches. EPA anticipates periodically creating an addendum to this conservation plan to describe new approaches.

6. Conclusions

EPA has developed a plan for furthering the recovery of listed species under the authority of FWS and thus, streamlining section 7(a)(2) conventional pesticide consultations. This conservation plan is a proactive, strategic, large-scale approach to help alleviate the impacts of pesticide exposure to listed species, thus furthering their recovery, while assessing and mitigating any remaining impacts of pesticides through more efficient section 7(a)(2) consultation with the Service. The approximately 1600 listed species under FWS authority are diverse and occur throughout the US. EPA has developed and continues to develop various multi-chemical approaches that are intended to group mitigations for pesticides by location, pesticide class or use site. Final or draft multi-chemical approaches are available for conventional herbicides, insecticides and rodenticides, and the Vulnerable Species Action Plan. EPA is also developing an approach focused on Hawai'i and considering developing approaches for the US territories. These multi-chemical approaches are intended to develop mitigations based on a common set of considerations. This increases efficiency in identifying and implementing mitigations and ultimately decreases the time it takes to get protections in place for listed species. EPA believes that these increased efficiencies in process and implementation of mitigations can increase the efficiency of 7(a)(2) consultations. By implementing mitigations proactively before consultation and by completing consultation sooner, EPA believes that the overall stressors that may be caused by pesticides can be reduced, thus helping conserve and recover listed species.

Appendix 1: Species Example to Illustrate how EPA's Plan Connects to FWS recovery plan: Rusty Patched Bumble Bee

In the Rusty Patched Bumble Bee (RPBB; *Bombus affinis*) species status assessment²⁸, FWS identified pesticides as a stressor. In FWS's recovery plan²⁹, one of the recovery actions is "minimiz[ing] exposure to harmful pesticides." One specific measure that was identified is to "implement pesticide minimization measures." EPA believes that the multi-chemical approaches described in this document incorporate this FWS measure. The RPBB is included in the Vulnerable Species Action Plan. Through that Action Plan, insecticide-specific mitigations will be identified (*e.g.*, to reduce spray drift or direct applications onto the species). EPA also believes that mitigations identified through the Herbicide Strategy will help reduce herbicide impacts to the habitat of this species, thus improving the quality of the RPBB habitat.

Another measure identified in FWS's recovery plan is: "Provide outreach and education to the public and agricultural community." EPA has begun outreach and education through the Herbicide Strategy and Vulnerable Species Action Plan. EPA created a Story Map for the RPBB³⁰ to increase awareness of this species and the proposed mitigations. EPA also plans to conduct additional education and outreach related to implementation of the final Herbicide Strategy and Vulnerable Species Action Plan.

Another relevant action in the recovery plan that is addressed with EPA's strategies includes: "Manage, protect, and enhance habitat." If habitat is created as part of an offset approach, EPA expects that high quality habitat would be created/restored and maintained to replace lower quality habitats where pesticide exposures are occurring and habitats are not being maintained as habitat (*e.g.*, this may create habitats to offset impacts that occur when RBPP visits agricultural fields or orchards that are attractive to the species). This may result in additional habitat created to increase the amount of habitat available for this species. EPA believes that creation of habitat can help advance this recovery action and further the recovery of the RPBB. This effort may also involve incentivizing pesticide applicators/growers to create habitat by giving applicators credit so that avoidance or minimization mitigations of pesticides would be reduced.

FWS identified two other measures relevant to pesticides, including: "Conduct population-specific pesticide assessments and risk analyses; and conduct research on sources, exposure, and impacts of pesticides." EPA's OPP and ORD are currently working with FWS to develop a landscape scale, population-level approach to assessing impacts of pesticides on the RPBB. This approach is intended to involve evaluations of how different types of mitigations (avoidance, minimization, and offsets) can be combined to reduce exposures of currently registered pesticides on this species. EPA believes that this research may also help predict the recovery of this species over time by developing a framework where modelers can simulate the status of the RPBB over time, with consideration of positive impacts of decreasing pesticide stressors.

²⁸ https://ecos.fws.gov/ServCat/DownloadFile/120109
²⁹

https://ecos.fws.gov/docs/recovery_plan/Final%20Recovery%20Plan%20_Rusty%20Patched%20Bumble%20Bee_2 021.pdf

³⁰ https://storymaps.arcgis.com/stories/76350f903b7d4ec6b4fb2dccf7a379ea

Appendix 2: Species Example to Illustrate how EPA's Plan Connects to FWS recovery plan: San Joaquin Kit Fox and other Species in the San Joaquin Valley

FWS's recovery plan for upland species of the San Joaquin Valley in CA includes the San Joaquin Kit Fox (SJKF; *Vulpes macrotis mutca*)³¹ and identifies this species as an umbrella species³² for the San Joaquin Valley. An umbrella species is one whose conservation results in the protection of many other species occurring in its habitat. Other listed species that occur in the same habitat include the giant kangaroo rat, Tipton kangaroo rat, California tiger salamander, Alameda whipsnake, and palmate-bracted bird's beak. Therefore, EPA's conservation measures that further the recovery of the SJKF are expected to also help further the recovery of other species within the SJKF's umbrella.

The FWS recovery plan that includes the SJKF uses an ecosystem-level strategy that establishes a network of areas representing habitat of the San Joaquin upland species. This recovery plan focuses on maintaining and enhancing habitat, with an emphasis on larger blocks of land and making connections between habitats so that individuals can move between habitats. Building on the recovery plan, the 2010 FWS 5-year review³³ identifies the following threats to the SJKF: habitat destruction and modification; rodenticides; and prey availability. The FWS Species Status Assessment³⁴ for SJKF also identifies rodenticides as a stressor. One of the recovery plan actions for SJKF is to "determine habitat restoration and management prescriptions for kit foxes...[with a] focus on factors that promote populations of prey species."³⁵ SJKF primarily feeds on a variety of small mammals including mice, kangaroo rats, rats, rabbits, hares, and ground squirrels. Conservation measures that result in reduced rodenticide exposure for the SKJF prey species will contribute to SJKF recovery by reducing impacts of rodenticides on listed mammalian prey species, as well as impacts on the giant kangaroo rat and Tipton kangaroo rat. As part of the Rodenticide Strategy, EPA plans to propose mitigations to reduce impacts of rodenticides on listed species that may directly consume bait or be exposed through consumption of contaminated prey. This is in line with FWS's conservation measures for the SJKF and will reduce rodenticide impacts on other species under the SJKF umbrella (*e.g.*, giant and tipton kangaroo rats).

Other EPA approaches are also relevant to SJKF and the recovery plan focus of maintaining and enhancing SJKF habitat. As noted above for RPBB, EPA believes that mitigations identified through the Herbicide Strategy will help reduce herbicide impacts on plants that are important to the habitat of SJKF and other species under its umbrella, thus improving habitat quality and contributing to species recovery. Also, the SJKF is known to sometimes eat insects. So, the general label mitigations identified in the draft Insecticide Strategy³⁶ will likely reduce impacts to insect communities that may represent the prey of the SJKF.

³³ https://ecosphere-documents-production-

³¹ <u>https://ecos.fws.gov/docs/recovery_plan/980930a.pdf</u>

³² <u>https://www.nps.gov/articles/surrogate-species-piecing-together-the-whole-picture.htm</u>

public.s3.amazonaws.com/sams/public_docs/species_nonpublish/1552.pdf

³⁴ <u>https://ecos.fws.gov/ServCat/DownloadFile/185116</u>

³⁵ <u>https://ecos.fws.gov/docs/recovery_plan/980930a.pdf</u>

³⁶ <u>https://www.regulations.gov/docket/EPA-HQ-OPP-2024-0299/document</u>

EPA is currently investigating offsets as approaches to develop habitat for listed species. There are currently four conservation banks established for SJKF covering more than 5,000 acres.³⁷ Existing conservation bank approaches could be used as an example for developing offsets for the SJKF. The conservation banks may align with FWS goals for this species to maintain and enhance habitat of this species and others in the San Joaquin Valley. Offsets could be an opportunity to expand or connect existing habitat areas used by this species and others. For pesticide applicators participating in offsets, it may be possible to reduce avoidance or minimization of rodenticide uses.

EPA also has a plan to develop educational materials for its conservation measures. The Agency has previously developed materials for endangered species to raise awareness and educate the public about these species.³⁸

 ³⁷ The conservation banks are: Drayer Ranch, Kern Water, Kreyenhagen Hills, and Vieira-Sandy Mush Road.
 <u>https://www.fws.gov/sites/default/files/documents/SFWO Conservation%20Banks%20 ALL Final%2012-2-2021.pdf</u>
 ³⁸ For example, for the SJKF: <u>https://www.epa.gov/sites/default/files/2013-08/documents/san-joaquin-kitfox.pdf</u>