

# Great Lakes Restoration Initiative Pollinator Conservation Strategy & Action Plan

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## Problem Statement

Native insect pollinators are important components of ecosystems, acting as keystone species, providing ecosystem resilience and economically important ecosystem services. Ninety percent of the world's flowering plants depend on insect pollination for reproduction (Ollerton et al. 2011). However, significant population decline has occurred across the entire class Insecta worldwide (Sánchez-Bayo et al. 2019). Forty percent of the world's invertebrate pollinators are at risk of extinction, most of which are bees and butterflies (IPBES 2016). Several pollinator species have demonstrated significant population and distribution declines across the U.S., including within the Great Lakes Basin. Critically, some species are now facing extinction, such as Poweshiek skipperling, Mitchell's satyr butterfly, and Rusty-patched bumble bee, which are federally listed as Endangered. Other once-common species are now being considered for potential protection under the Endangered Species Act, such as monarch butterfly and yellow-banded bumble bee, species that could be representative of declines in other pollinators in the region. This decline in native pollinators presents a risk to biological communities, ecosystems, crop production, and has implications for human wellness (Eilers et al. 2011).

In recognition of the significance of pollinators, the Federal government established an interagency Pollinator Health Task Force, which has produced a Pollinator Partnership Action Plan ([https://www.whitehouse.gov/sites/whitehouse.gov/files/images/Blog/PPAP\\_2016.pdf](https://www.whitehouse.gov/sites/whitehouse.gov/files/images/Blog/PPAP_2016.pdf)). The Action Plan serves as a framework for coordinating efforts across stakeholders, including state, local, industry, and citizen groups, with interests in and capacities to address the many challenges pollinators face.

This strategy will step down national level efforts to conserve pollinators at the Great Lakes Basin level. This Great Lakes-based interagency, collaborative strategy will use an overarching approach to pollinator conservation across the basin that is supported with Great Lakes Restoration Initiative (GLRI) funding and is leveraged with expertise and funding from partners and stakeholders. We recognize and respect the significant initiatives and efforts of other pollinator conservation stakeholders in the Basin. This GLRI effort is intended to add value to on-the-ground conservation in collaboration with others by leveraging the capacity, expertise, and resources with other pollinator conservation stakeholders.

## GLRI Action Plan & Template Background

In 2017, the U.S. Fish and Wildlife Service (FWS) submitted a GLRI template proposal to strategically conduct pollinator conservation within the Great Lakes Basin (GLB). The proposal (named the GLRI Pollinator Conservation Template, hereafter 'Template') was funded, with the caveat that efforts would be a collaboration between FWS, U.S. Forest Service (USFS), National Park Service (NPS) and other interested federal agencies. The Template aligns with GLRI Action Plan II (2015-2019) and III (2020-2024). GLRI Action Plans outline how GLRI-

funded federal agencies will target their activities in different Focus Areas. Focus Areas from the Action Plans include 5 categories:

- Toxic Substances and Areas of Concern
- Invasive Species
- Nonpoint Source Pollution Impacts on Nearshore Health
- Habitats and Species
- Foundations for Future Restoration Actions

Each Focus Area in the GLRI Action Plan contains Objectives, Commitments and Measures of Progress. Please refer to the GLRI Action Plan III (APIII) for more detailed information (<https://www.glri.us/action-plan>).

The Template is being conducted under Focus Area 4, Habitats and Species, and the Strategy will align with Objective 4.1 of APIII to “protect and restore communities of native aquatic and terrestrial species important to the Great Lakes”, through the commitment: “identify, restore and protect habitats and provide habitat connectivity to support important species and associated habitats.” Outputs and outcomes of activities to support this objective and commitment will be measured by acres of habitats restored, protected, or enhanced.

## Collaboration

The GLRI Pollinator Task Force (Task Force) has been established to collaborate on the Strategy and oversee direction and implementation of identified Strategy activities. The Task Force is currently comprised of representatives of FWS, USFS, NPS, Natural Resource Conservation Service (NRCS) and, U.S. Geological Survey (USGS).

The Task Force will generally meet in-person on a bi-annual basis and will convene teleconferences on as-needed basis to plan, direct and conduct the work under this Strategy. Other partners may be added in the future.

We recognize the value of engaging additional collaborators and will reach out to other federal, state and local agencies, Native American Tribes, academia, industry and other stakeholders to leverage existing resources and expertise in pollinator ecology and conservation.

Each participating entity will apply its specific authorities, expertise, and capacity, in alignment with their agency missions, land holdings, and trust resources, to advance the shared goals and priorities identified in this document.

The Task Force will coordinate with other GLRI Work Groups in Focus Area 4 (Habitats and Species) and other Focus Areas, to complement and leverage resources and to integrate native insect pollinator conservation throughout GLRI.

## Purpose

This Strategy will serve as an adaptable 5 year plan (5YP) to guide activities conducted under the Template. It is intended to facilitate inclusive, coordinated, and cost-effective efforts to

conserve native insect pollinators throughout the GLB. Specifically, the 5YP guides the multi-agency effort to contribute to Objective 4.1 of the GLRI Action Plan III, “Protect and restore communities of native aquatic and terrestrial species important to the Great Lakes”, and lays out the goals and objectives to provide direction and focus for the template.

This Strategy will also provide an accessible and informative means to communicate with stakeholders regarding the pollinator work that is being conducted under the GLRI.

## Vision

The Task Force envisions the Great Lakes Basin landscape supporting self-sustaining populations of native insect pollinators and their associated and interconnected, diverse habitats, with both the pollinators and their habitats being resilient to changing environmental conditions and continuing to provide critical ecological services, aesthetic value and integrity to ecosystems. Through this Strategy, we seek to increase pollinator community resiliency, reduce or eliminate the future need to list native insect pollinator species under the Endangered Species Act (ESA), restore diverse interconnected pollinator habitat, and increase public awareness and general knowledge of Great Lakes native pollinator conservation issues and efforts.

## Operating Principles

The Pollinator Strategy adopts the operating principles identified in the GLRI Action Plan III. Integrating the principles into the Pollinator Strategy and the work conducted under the Strategy will help to guide and inform the GLRI Pollinator Task Force, partners and collaborators to plan, identify, and implement projects that will best contribute to achieving the Strategy’s Vision, Goals and Objectives. Adhering to these principles will help ensure accountability; learning, improving and adapting as we move forward; ensuring the durability of our GLRI investments; and engaging and communicating with others about our conservation efforts.

### GLRI Operating Principles:

- Accountability – track progress of all projects conducted through this strategy to ensure they are meeting project and template goals.
- Reporting – report progress and success stories through the GLRI Environmental Accomplishments for the Great Lakes (EAGL) reporting and requests from EPA.
- Communication and Outreach – update publicly available online information related to the strategy and seek new ways to communicate the status of ongoing work internally and externally.
- Partnerships and Engagement – collaborate with other federal agencies, states, tribes and local stakeholders to solicit and select the best projects to support sustainability of pollinators and their associated habitats.
- Long-term Project Maintenance – apply guidelines and expectations to ensure proper

stewardship and maintenance of restoration projects to achieve long-term benefits.

- Project Resiliency – apply resiliency criteria in planning and implementing projects to ensure GLRI-funded projects are resilient to the effects of multiple stressors in the Great Lakes basin and remain functional in the face of future environmental stressors.
- Science-Based Adaptive Management – use a structured management approach to evaluate management uncertainties, monitor effectiveness of projects, inform future restoration, and use the best available science and traditional ecological knowledge in decision making.
- Strategy adaptability- this strategy is a living document, is to be adaptive in nature, requiring flexibility in future year planning based on funding, staff availability, etc. Goals and Actions within this 5YP may occur consecutively or concurrently. The Action Plan will be reviewed annually by the Task Force and adapted/amended as needed.
- Decision making- done by general agreement or consensus of the Task Force members.

### **GLRI Pollinator Template Goals**

1. Determine the distribution and status of key native insect pollinator communities and their habitats within the Great Lakes Basin.
2. Identify and prioritize activities and focus areas in the Great Lakes Basin for on-the-ground conservation and restoration efforts that will help ensure viable communities of native insect pollinators and have the greatest benefit to increase their resilience and persistence.
3. Understand the key threats to native insect pollinators in priority focus areas, including critical information on the effects of pathogens, contaminants, and pesticide use on pollinators and factor this information into planning and implementing conservation activities.
4. Implement, with partners and collaborators, habitat restoration, enhancement and protection projects in focus areas.
5. Monitor, evaluate and/or adaptively manage the projects.
6. Educate the public and regional decision-makers about the importance of pollinators and mobilize them to help engage and promote pollinator conservation.

# GLRI Pollinator Action Plan

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As stated above, the Pollinator Conservation Strategy was developed to strategically reverse pollinator declines, reduce or eliminate the future need to list native insect pollinator species under the ESA, restore diverse, interconnected pollinator habitat, and increase awareness of the need for pollinator conservation. Native bees are one of the most imperiled groups of pollinators; they play a significant role as keystone species in our ecosystems, and are the most effective native pollinators across the diverse habitats of the Great Lakes Basin. As such, the GLRI Pollinator Task Force selected native bees as the focal suite of species for this 5-year strategy and the following goals and actions pertain to native bees of the Great Lakes Basin.

By focusing on native bees, there will be overlapping benefits for other insect pollinators because native bees are so varied in life history traits. Native bees are also represented in the diverse habitats found within the GLB and there is much to be learned about their distributions within the Great Lakes region. Lastly, native bees are generally underrepresented in other pollinator strategies and actions. The Strategy will use best management practices to support enhancing, restoring and creating desired habitat conditions for native bees. As new conservation priorities arise, new suites of pollinator species may be chosen to reflect current needs.

## Template Goal 1

Determine the distribution (historic and/or current) and status of native bee species and their habitats within the Great Lakes Basin.

### Actions:

1. Compile readily available information (literature search, distribution maps, and expert knowledge) on best-known distribution and floral use/habitat use of native bee species within the GLB. Store in a publicly available database.
  - a. Identify and/or hire a person(s) to complete this task.
  - b. Prioritize the following list of items to search based on availability of access and degree of quality.
    - i. Published literature and data sets
    - ii. Identify key native bee researchers who have data sets and contact them
    - iii. Federal datasets (e.g., USGS Bison, USFWS [rusty-patched bumble bee, FWSpecies, ECOS], EPA's EnviroAtlas)
    - iv. State data (e.g., NHI, SWAP)
    - v. Publicly available data (e.g., IUCN, NatureServ, Bumble Bee Watch, Atlas of Life)
  - c. Conduct the searches.
  - d. Identify if a database currently exists that can house this information or if one needs to be created. If one needs to be created, identify GIS/database specialist who can complete the task.

2. After determining best-known historic and current distribution of native bee species, identify informational gaps to guide focus area selection and future work in priority focus areas (e.g., surveys, collection records search).
  - a. Identify and/or hire a person(s) to complete this task
  - b. Prioritize data gaps that will identify restoration action.
    - i. Overlay distribution maps of species (from Action 1) and habitat type/land use spatial data to identify “hot spots” by habitat type.
  - c. Prioritize areas for future surveys (qualitative and quantitative).
3. Determine what current survey efforts exist and are underway for native bees.
  - a. Identify and/or hire a person(s) to complete this task.
  - b. Known/potential current surveys:
    - i. Forest Service
    - ii. NPS
    - iii. FWS
    - iv. USGS
    - v. Rusty patched bumble bee
    - vi. HAPET
    - vii. Citizen science (Bumble Bee Watch, WI Bumble Bee Brigade, iNaturalist)
    - viii. Research projects (academic, others)
4. In the future, consider evaluating abundance and trends of native bee species.

## Template Goal 2

Identify and prioritize activities and focus areas in the Great Lakes Basin for on-the-ground conservation efforts that will help ensure viable communities of native bees and have the greatest benefit to increase their resilience and persistence.

### Actions:

1. Hold a native bee science support workshop to gain information and feedback on our actions under this template
  - a. Write a prospectus about the Task Force to share with prospective attendees of the science support workshop(s)
  - b. Reach out to relevant experts with science background from:
    - i. Academic community
    - ii. State governments
    - iii. USGS
    - iv. USDA
    - v. Other important partners
2. Identify focus areas in GLB where habitat management, restoration or conservation will have the greatest benefit for native bee species; helping to ensure viable communities of native bees and increasing their resilience and sustainability, with the following criteria:
  - a. Public, protected lands & adjacent land

- b. Reflect distribution across diverse habitat types
  - c. Existing and/or recently restored habitat and areas of potential restoration, enhancement, protection, including protected private lands (CRP, PFW Projects, etc.)
  - d. GLRI funding adds a substantial, tangible benefit
  - e. Partnership opportunities and consideration of existing focal areas
  - f. Unique attributes (e.g. size, soil diversity, unique flora, habitat rarity, topographic diversity)
3. Conduct surveys for bees and habitat in priority focus areas with data gaps.
    - a. Stay informed on National survey standardization efforts
    - b. Determine a standardized survey method(s), including what level of identification is needed (genus, species, etc.) and where lethal surveys can be completed.
    - c. Develop survey protocol framework (or directly adopt protocol being used by FS and NPS) and site-specific protocols
    - d. Select survey sites
    - e. Determine who will identify and store collected specimens
    - f. Determine key personnel involved with survey (field surveyors, survey coordinators, data management/analysis, reporting)
  4. Revise focus areas using information from Goal 1.

### **Template Goal 3**

Understand the key threats to native bees in priority focus areas, including critical information on the effects of pathogens, contaminants and pesticide use on native bees, and factor this information into planning and implementing conservation activities.

#### **Actions:**

1. Identify & quantify stressors for native bees in priority focus areas, including climate change, habitat loss/degradation, invasive species, contaminants, and pathogens.
2. Rank stressors within priority focus areas by importance or by what we can influence.
3. Develop actions to mitigate stressors based on what we can influence.
4. Evaluate habitat quality of priority focus areas
  - If pesticides are a potential threat:
    - Evaluate pesticide pathways, determine approaches to minimize adverse impacts to native bees and develop mitigative measures to lower insecticide risk in focus areas where it is determined to be an issue.
    - Promote native plantings to achieve multiple ecosystem goals; pollinator conservation, water quality, plant diversity, nutrient retention.

If habitat loss and/or degradation is a potential threat:

- Determine how to minimize adverse impacts due to habitat loss and which types of habitats and their locations are needed to protect, restore and enhance
- Determine which activities to conduct, such as control of invasive species, address fragmentation and corridors, etc. (actions specific to area)

## Template Goal 4

Implement, with partners and collaborators, habitat restoration, enhancement and protection projects in focus areas.

### Actions:

1. Work with partners to restore, enhance, and protect high priority native bee habitat in focus areas to ensure quality habitat for native bees within the GLB
  - a. Work with MDARD, DNR, USDA, FSA, Conservation Districts, Xerces Society, Pollinator Partnership, Bee & Butterfly Fund and others within focal areas.
2. Develop and/or compile existing best management practices (BMPs) for protecting, restoring and enhancing native bee species and their habitats in focus areas.
  - a. Reach out to other GLRI activities and work groups to adopt Great Lakes-specific BMPs, e.g., GLRI Sustain Our Great Lakes and National Fish and Wildlife Foundation (NFWF) Pollinator Conservation grants.

## Template Goal 5

Monitor, evaluate and/or adaptively manage projects.

### Actions:

1. Evaluate native bee habitat and native bee species to determine effects of habitat work
  - a. What actions did we take?
  - b. Were our actions effective? (did we improve habitat, did population numbers increase due to increased habitat or measures to lower exposure of native bees to insecticides)
  - c. What do we need to do differently? How can we adapt?
2. Monitor and evaluate the Strategy and Action Plan
3. Adjust out-year Action Plan items as needed. Address knowledge gaps.
  - a. Annual meetings for review and adjustment of Strategy & Action Plan

## Template Goal 6

Educate the public and regional decision-makers about the importance of native bees & other pollinators and mobilize them to help engage and promote pollinator conservation. Provide information and products developed as a result of this strategy.

### Actions:



1. Develop synthesis of our work under this Strategy.
2. Engage key stakeholders in discussion about the importance of native bees and how they can contribute to pollinator conservation
  - a. Promote native bee pollination services.
  - b. Identify which key audiences have the greatest potential to impact native bee conservation
    - i. What outreach methods are best suited to specific groups?
3. FWS (National Wildlife Refuges, Partners for Fish and Wildlife), National Parks, National Forests, NRCS, BIA, tribes and other partners in the GLB provide educational materials to visitors, landowners and interested audiences
4. Develop and implement a communications campaign
5. In the future, consider determining the distribution of pollinator dependent crops in GLB to highlight areas with the greatest ecosystem service delivery potential (MI blueberries currently mapped).

### **Future partnerships & funding:**

1. Invest current funds in implementation actions and seek additional funding
  - a. Issue requests for funding proposals (RFPs) when funding is sufficient
2. Research how much funding is needed to implement sufficient habitat restoration, enhancement, protection and research for pollinator conservation.
3. Continue partner engagement to coordinate and collaborate on pollinator conservation throughout the GLB.
4. Explore other conservation connections with pollinators (ex. water quality)

## **Timeline: 2018-2023 5-year Strategic Plan**

### **FY 2018**

- GLRI Pollinator Coordinator position filled
- GLRI Pollinator Task Force Inception

### **FY 2019**

- Planning, including holding meetings/workshops with interested GLRI agencies to receive input, strategize, and determine areas of coordination
- Determine pollinator focal species/suites of species
- Conduct search of readily available information (literature search, distribution maps, and expert knowledge) on best-known distribution and floral/habitat use of native bee species within GLB. Compile and store in a publicly available database.
- Determine focus areas and high priority pollinator habitats needing restoration, enhancement and protection
- Determine standardized native bee survey methods for all collaborators under this Template to use
- Select sites for native bee surveys
- Survey native bee species at select sites

- Continue to improve habitat restoration/enhancement for native pollinators.
- Outreach & Education

### **FY 2020-FY 2023**

- Continue/expand native bee survey site selection and surveys
- Determine key threats to native bees in priority focus areas
- Implement habitat restoration, enhancement and protection in focus areas
- Contaminant related studies
- Monitoring/adaptive management
- Outreach & education

### **References**

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