

Final Performance Report



Wildlife and Sport Fish Restoration Program



U.S. Fish and Wildlife Service

OK-T-130-R-1 Status of Bumble Bees in Oklahoma: Distribution and Habitat Associations

Performance Report Approval Status:

Awaiting Federal Approval

Recipient:

OKLAHOMA DEPARTMENT OF WILDLIFE CONSERVATION

Recipient Grant ID:

Federal Award Number:

F22AF02986

Funding Program(s) Name:

SWG Implementation

Federal Award Start and End Date:

Jan 01, 2023 to Dec 31, 2023

Performance Reporting Period:

Jan 01, 2023 to Dec 31, 2023

Federal Award Recipient Contact(s):

Andrea Crews

Federal Award Specialist(s):

William Amy

Type of Performance Report:

Final Performance Report

Public Description:

Bumble bee declines have been documented worldwide and two bumble bee species in the continental United States, the rusty patched bumble bee (*Bombus affinis*) and Franklin's bumble bee (*B. franklini*), are already listed as endangered under the Endangered Species Act. Two bumble bee species with ranges that include Oklahoma have been petitioned for listing, including the American bumble bee (*B. pensylvanicus*) and the variable cuckoo bumble bee (*B. variabilis*), and efforts are underway to petition for the listing of the Southern

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Plains bumble bee (*B. fraternus*). There are numerous records of *B. pensylvanicus* in Oklahoma in recent years, but few records of *B. fraternus*. *Bombus variabilis* has not been recorded since 1999 (Tyler 2021), with the last specimen from Oklahoma collected in Oklahoma County in 1975 (Table 3). This project will assess the status of the bumble bee community in Oklahoma through a statewide survey with an emphasis on locations where *B. fraternus*, *B. pensylvanicus*, and *B. variabilis* have been previously recorded. Floral hosts will be documented, and vegetation surveys and other relevant habitat characteristics will be recorded at each survey location. Historical and recent observations of *B. fraternus*, *B. pensylvanicus*, and *B. variabilis* from other sources will also be compiled, including from photo sharing websites. Participation in existing community science projects will also be encouraged, including iNaturalist and Bumble Bee Watch. Results will be reported in both raw and synthesized form, including an interpretation of the results in the context of the status of bumble bees in Oklahoma.

Federal Award Accomplishments				
Strategy	Proposed Objective	Activity	Unit of Measure - Proposed	Unit of Measure - Reported
Research, Survey, Data Collection and Analysis	Conduct investigations	Fish and wildlife species data acquisition and analysis	1 Investigations	0 Investigations

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**Project Statement: OK-T-130-R-1 Status of Bumble Bees in Oklahoma:
Distribution and Habitat Associations
Project Statement Approval Status: Final Approved**

Objective Name: Objective 1

Strategy: Research, Survey, Data Collection and Analysis

Proposed Objective: Conduct investigations

Pertains to R3: No

No quantifiable result to report.

Explanation:

The grant was closed early and objectives were not met.

See "questions" for additional information.

Activity Performed: Fish and wildlife species data acquisition and analysis

of Investigations: 1.0000

Principal Investigator: Kristen Baum

No quantifiable result to report.

Explanation:

The grant was closed early and objectives were not met.

See "questions" for additional information.

Geographic Location:

- General Location: Oklahoma
- Includes Marine Federal Waters: No
- Detailed Location:
- Location Description:

Surveys will be conducted statewide. The counties where *B. variabilis* has been recorded overlap with those for *B. fraternus* (Tables 1, 3), except for Major County where only *B. variabilis* has been recorded. Leif Richardson (Xerces) has a record from Figueroa for *B. fraternus* from Major County from 3 June 1932 from the OKState collection, but that appears to be an error, and there is a missing specimen from Woodward County from 8 June 1966. *Bombus pensylvanicus* has been documented from most counties and all ecoregions (Table 2). *Bombus fraternus* records occur within all ecoregions except for the Ozark region. Sites for surveys of roadsides and natural/

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semi-natural areas will be focused on ecoregions relative to their size/availability. We will take advantage of WMAs and State Parks throughout the state (but can reduce overlap with locations visited by Figueroa and Bergey (2015) during their 2013 survey, if preferred by ODWC) as well as existing connections with private land managers which are primarily located in the Cross Timbers and Mixed-grass Prairie ecoregions.

Activity Report Comments:

*Totals to date represent a cumulative total of all period of performance and may exceed the objective.

Objective Report	
Period of Performance	# of Investigations
Jan 1, 2023 to Dec 31, 2023	
Totals to Date*	0

Species Tags

Species Tags		
Southern plains bumble bee <i>Bombus fraterus</i>	Brown-belted bumble bee <i>Bombus griseocollis</i>	<i>Bombus impatiens</i>
bumble bee; American bumble bee <i>Bombus pensylvanicus</i>	Sonoran Bumble Bee <i>Bombus sonorus</i>	<i>Bombus variabilis</i>

Activity Performed Attachments

Note: Some attachments listed here may not appear in the Appendix due to file incompatibility. All attachments can be accessed using the links below.

Descriptive Name	Field tags	Attachment Type
No Files Attached		

Performance Reporting Questionnaire

1. What progress has been made towards completing the objective(s) of the project?

We have no results to report, and no funds were spent. However, PI Baum compiled existing records as part of the proposal for this project, developed materials for encouraging submission of observations to iNaturalist (i.e., examples of how less than perfect images can still provide adequate information for bumble bee species identifications), and made several presentations to public groups that encouraged participation (Objective 1). PI Baum also reviewed existing data in the Baum lab for prioritizing roadside sites for surveys and compiled a list of other relevant sites, both from previous projects and general knowledge about the state (Objective 2). This was preliminary work and was not charged to the grant and the PI did not seek reimbursement. This work was completed prior to us knowing that the PI was resigning from her position at OSU.

2. Please describe and justify any changes in the implementation of your objective(s) or approach(es).

PI Baum accepted a position as the Director for Monarch Watch at the University of Kansas in May and talked with Curtis Tackett (ODWC) about this grant in June of 2023 with a request to move the grant to the University of Kansas (KU). In August, the OK Cooperative Fish and Wildlife Research Unit let PI Baum know that ODWC did not want to move the grant out of state. We discussed options for identifying another PI at OSU, but there were no existing collaborators on the grant or others with similar expertise at OSU. Other deviations include that PI Baum had anticipated a PhD student with bumble bee expertise to graduate in May 2023 and work on this project starting in summer 2023. The student was delayed and it did not make sense to recruit another person when PI Baum was moving to another institution and the status of this project (and the associated technician position) was unclear.

3. If applicable, please share if the project resulted in any unexpected benefits, promising practices, new understandings, cost efficiencies, management recommendations, or lessons learned.

Not Applicable

4. For Survey projects only: If applicable, does this project continue work from a previous grant? If so, how do the current results compare to prior results? (Recipients may elect to add attachments such as tables, figures, or graphs to provide further detail when answering this question.)

Not Applicable

5. If applicable, identify and attach selected publications, photographs, screenshots of websites, or other documentation (including articles in popular literature, scientific literature, or other public information products) that have resulted from this project that highlight the

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accomplishments of the project.

Not Applicable

6. Is this a project you wish to highlight for communication purposes?

No

Questionnaire Attachments

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No Files Attached		

Appendix