

Pennsylvania Department of Transportation
Voluntary Prelisting Pollinator
Conservation Program

JUNE 2019
AMENDED NOVEMBER 2019





Cover collage: Toni Zawisa, Pennsylvania Department of Transportation
Cover photo credits: monarch with coneflower, PSU Center for Pollinator Research Image Gallery, jacksonsjourneysphotography.com; roadside pollinator habitat, Ohio Department of Transportation

Report layout: Toni Zawisa, Pennsylvania Department of Transportation



November 12, 2019

Sonja Jahrsdoerfer
Pennsylvania Field Office Supervisor
United States Fish and Wildlife Service
110 Radnor Road, Suite 101
State College, PA 16801

RE: PennDOT Voluntary Pre-Listing Pollinator Conservation Program

The Pennsylvania Department of Transportation (PennDOT) acknowledges receipt of the United States Fish and Wildlife Service (USFWS) September 25, 2019, letter, which recognized PennDOT's Voluntary Pre-listing Pollinator Conservation Program (Program) and requested some minor revisions to ensure that the Program is consistent with the USFWS pre-listing conservation guidance. To this end, the tables that follow, provide responses, clarifications and serve as an erratum to the original Program document.

PennDOT reaffirms its commitment to this voluntary, non-regulatory, pro-active conservation effort for the benefit of the yellow banded bumblebee, monarch butterfly, regal fritillary and frosted elfin with the intended purposes of preventing these pollinator species of special concern from requiring federal protection under the Endangered Species Act (ESA) and the self-certification of advance off-set credits should they be needed in the future.

To assure that the Program is transparent and defensible, PennDOT will make the errata and associated correspondence accessible at [2019 PennDOT Voluntary Prelisting Pollinator Conservation Program](#) and will pursue the Program with the advisement and oversight of the PennDOT Pollinator Work Group.

Should you have any questions, please contact Mark Lombard at 717-772-2569 or email mlombard@pa.gov.

Sincerely,

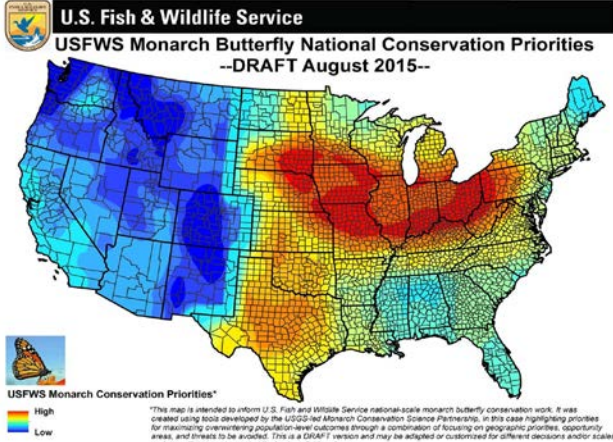
A handwritten signature in blue ink, appearing to read "George W. McAuley, Jr.", is written over a faint, larger version of the same signature.

George W. McAuley, Jr., P.E.
Deputy Secretary for Highway Administration

cc: Karen Anderson, USFWS
Robert M. Anderson, USFWS
Jennifer Kagel, USFWS
Jonathan Crum, FHWA
Drew Ames, PennDOT, BOPD-EPDS
Toni Zawisa, PennDOT, BOPD-EPDS



Page # & section	Passage Reference	USFWS Comment	PennDOT Response/Errata
Page 3, Section C.	“The credits achieved in 2016-2018 are available to offset the effects of PennDOT actions...”	The Service’s Director signed the Director’s Order (DO) on January 18, 2017 and the DO was signed into Service policy on May 31, 2018. According to the policy, actions taken prior to the January 2017 signing of the DO are not available for credits to offset actions that may affect pollinator habitat. We recommend that the information collected during the 2016 work be used to bolster the proposed Program and act as background evidence for the proposed activities.	Text revision: “The credits achieved in 2017-2018 are available to offset the effects of PennDOT actions...” And “Table 6: Monarch Voluntary Conservation Action Credit Ledger: Conservation Actions and Predicted Credits” is revised to reflect the crediting changes.
Page 4, Section iii, Part 6.	“The presence of invasive species, any site disturbances and the need for implementation of any post effort maintenance measures...”	Please provide a list of the types of post-effort maintenance measures that could take place or reference those documents that describe these actions.	PennDOT Publication 23, Chapter 13, Roadside Management describes the post-effort maintenance measures that could take place.

Page # & section	Passage Reference	USFWS Comment	PennDOT Response/Errata
Page 5, Section c.	“ <u>Credit Ratio</u> . The Following ratios will be applied to credits yielded from conservation efforts...”	Please describe how the credit ratios were determined, or document the methods that were used to develop the credit ratios (<i>i.e.</i> , reference a document, map, paper, etc.).	<p>The PA DEP Chapter 105/404 permit program utilizes ratios of 1:1, 1.5:1 and 2:1 to distinguish variations in wetland mitigation replacement. We utilized a similar system of 1:1, 1.25:1 and 1.5:1 ratios to identify values for high, medium and standard monarch habitat crediting. As identified and further explained on page 22, Section c., The USFWS, as depicted in the graphic below, had identified specific regions of the US as greater conservation priorities for the monarch. High priority areas in Pennsylvania align with the North Core Conservation Unit with waning priority moving eastward. An analysis utilizing the heat graphic below and the USFWS Monarch Conservation Units was performed to identify a ratio for each county in Pennsylvania.</p> 

Page # & section	Passage Reference	USFWS Comment	PennDOT Response/Errata
Page 5, Section 2, Part b.	“The nectar producing plants present post effort must include at least one of the following:...”	Please clarify the number “one” (<i>i.e.</i> , one plant vs. one of the following <i>species</i>)	Revised text: “The nectar producing plants present post effort must include at least one of the following species:...”
Page 5, Section 2, Part c.	“A Voluntary Conservation Action Credit Ledger, specific to the yellow banded bumblebee will be developed...No credit ratios are proposed for this species.”	If there are no credit ratios established, credits cannot be awarded. As discussed, please clarify that there are no credit ratios beyond a ratio of 1:1, and the adaptive management proposal for developing ratios and revising the Program during subsequent years.	Revised text: “A Voluntary Conservation Action Credit Ledger, specific to the yellow banded bumblebee will be developed...A 1:1 credit ratio is proposed for this species.”
Page 6, Section 3, Part c.	“A Voluntary Conservation Action Credit Ledger, specific to the regal fritillary will be developed...No credit ratios are proposed for this species.”	If there are no credit ratios established, credits cannot be awarded. As discussed, please clarify that there are no credit ratios beyond a ratio of 1:1, and the adaptive management proposal for developing ratios and revising the Program during subsequent years.	Revised text: “A Voluntary Conservation Action Credit Ledger, specific to the yellow banded bumblebee will be developed...A 1:1 credit ratio is proposed for this species.”
Page 6, Section 4, Part c.	“A Voluntary Conservation Action Credit Ledger, specific to the frosted elfin will be developed...No credit ratios are proposed for this species.”	If there are no credit ratios established, credits cannot be awarded. As discussed, please clarify that there are no credit ratios beyond a ratio of 1:1, and the adaptive management proposal for developing ratios and revising the Program during subsequent years.	Revised text: “A Voluntary Conservation Action Credit Ledger, specific to the yellow banded bumblebee will be developed...A 1:1 credit ratio is proposed for this species.”

Table 6 (revised): Monarch Voluntary Conservation Action Credit Ledger: Conservation Actions and Predicted Credits

Conservation Action	Reportable Pre-Listing Period ¹						Goals									
	2016		2017		2018		2019		2020		2021		2022		2023	
	acres	credits ²	acres	credits ²	acres	credits ²	acres	credits ²	acres	credits ²	acres	credits ²	acres	credits ²	acres	credits ²
reduced mowing or increased conservation mowing ³	9,940	568,051	-386	-22,074	15,095	862,658	4,108	381,428	4,108	381,428	4,108	381,428	4,108	381,428	4,108	381,428
daylighting	665	64,237	1,840	186,412	988	94,047	1,000	42,850	1,000	42,850	1,000	42,850	1,000	42,850	1,000	42,850
planted sites	0	0	0	0	0	0	22	943	55	2,357	110	4,714	110	4,714	110	4,714
annual beneficial acres	10,605		1,454		16,083		5,130		5,163		5,218		5,218		5,218	
Credits gained for year		0		164,338		956,705		425,221		426,635		428,991		428,991		428,991
10% Net Benefit Set Aside		0		16,434		95,671		42,522		42,663		42,899		42,899		42,899
Annual Credits - Set Aside		0		147,904		861,034		382,699		383,972		386,092		386,092		386,092
Annual Effects ⁴		371,250		371,250		371,250		371,250		371,250		371,250		371,250		371,250
CREDITS AFTER OFFSETTING ANNUAL EFFECTS ⁵		0		-223,346		489,784		11,449		12,722		14,842		14,842		14,842
ACRUED CREDITS		0		-223,346		266,438		277,887		290,609		305,451		320,293		335,135
ACRUED SET ASIDE		0		16,434		112,104		154,626		197,290		240,189		283,088		325,987
Monitoring requirement for credit approval ⁶							87		129		130		130		52	

¹ credits achieved during 2016 are a reportable conservation benefit for the listing decision but cannot be accrued to offset actions because 2016 pre-dates the January 18, 2017 USFWS Director's Order establishing the *Policy Regarding Voluntary Pre-Listing Conservation Actions*

² credits = # milkweed stems above baseline or prior condition

³ 2019 - 2023 goals are a constant that is half the average of reduced & conservation mowing achieved in 2016-2018

⁴ avg 2019-2022 TIP effect of 23,250 + annual mowing effect of 348,000 used as a constant

⁵ monarch and yellow banded bumble bee credits; frosted elfin and regal fritillary credits due to host plant availability are not considered

⁶ monitoring requirements for 2019 are based on 2016-2018 daylighting; monitoring of planted acres occurs in the year following establishment.



United States Department of the Interior



FISH AND WILDLIFE SERVICE
Pennsylvania Field Office
110 Radnor Road
State College, Pennsylvania 16801-4850
814-234-4090

September 25, 2019

George McAuley
ATTN: Mark Lombard
PA Department of Transportation
400 North Street, 8th Floor
Harrisburg, PA 17120

RE: USFWS Project #2019-1344
Voluntary Pre-listing Pollinator Conservation Program

Dear Messrs. McAuley and Lombard:

This letter acknowledges the U.S. Fish and Wildlife Service's (Service) August 8, 2019, receipt of your August 2, 2019, letter, which transmits the Pennsylvania Department of Transportation's (PennDOT) newly developed Voluntary Pre-Listing Pollinator Conservation Program (Program). PennDOT, with support of the Federal Highway Administration, has developed a program that is voluntary, non-regulatory, and proactive for the conservation of pollinator species of special concern, including the Monarch, regal fritillary, and frosted elfin butterflies; and the yellow-banded bumblebee.

We acknowledge that PennDOT's intent of developing the Program includes implementing conservation actions that may preclude the need to list these pollinator species of concern under the Endangered Species Act (Act). If the Service determines in the future that these species do require protection under the Act, we acknowledge PennDOT's commitments through the Program to provide advanced credits to offset impacts to these four species of special concern that would result from transportation-related actions. We recognize PennDOT as the administrator of the Program, and the PennDOT Pollinator Work Group as providing Program oversight.

We reviewed PennDOT's proposed Program, and we have a few comments and concerns that PennDOT should address to ensure that the Program is consistent with the Service's pre-listing conservation guidance. The following table reflects a telephone discussion of September 5, 2019, with PennDOT staff regarding the Program. A variety of mechanisms were discussed to address the Service's recommendations, including document revision, amendment, adaptive management pathways, etc. with the goal of developing a transparent and defensible Program.

Page number & section	Passage	Comment
Page 3, Section C.	“The credits achieved in 2016-2018 are available to offset the effects of PennDOT actions...”	The Service’s Director signed the Director’s Order (DO) on January 18, 2017 and the DO was signed into Service policy on May 31, 2018. According to the policy, actions taken prior to the January 2017 signing of the DO are not available for credits to offset actions that may affect pollinator habitat. We recommend that the information collected during the 2016 work be used to bolster the proposed Program and act as background evidence for the proposed activities.
Page 4, Section iii, Part 6.	“The presence of invasive species, any site disturbances and the need for implementation of any post effort maintenance measures...”	Please provide a list of the types of post-effort maintenance measures that could take place, or reference those documents that describe these actions.
Page 5, Section c.	“ <u>Credit Ratio</u> . The Following ratios will be applied to credits yielded from conservation efforts...”	Please describe how the credit ratios were determined, or document the methods that were used to develop the credit ratios (<i>i.e.</i> , reference a document, map, paper, etc.).
Page 5, Section 2, Part b.	“The nectar producing plants present post effort must include at least one of the following:...”	Please clarify the number “one” (<i>i.e.</i> , one plant vs. one of the following <i>species</i>)
Page 5, Section 2, Part c.	“A Voluntary Conservation Action Credit Ledger, specific to the yellow banded bumblebee will be developed...No credit ratios are proposed for this species.”	If there are no credit ratios established, credits cannot be awarded. As discussed, please clarify that there are no credit ratios beyond a ratio of 1:1, and the adaptive management proposal for developing ratios and revising the Program during subsequent years.
Page 6, Section 3, Part c.	“A Voluntary Conservation Action Credit Ledger, specific to the regal fritillary will be developed...No credit ratios are proposed for this species.”	If there are no credit ratios established, credits cannot be awarded. As discussed, please clarify that there are no credit ratios beyond a ratio of 1:1, and the adaptive management proposal for developing ratios and revising the Program during subsequent years.
Page 6, Section 4, Part c.	“A Voluntary Conservation Action Credit Ledger, specific to the frosted elfin will be developed...No credit ratios are proposed for this species.”	If there are no credit ratios established, credits cannot be awarded. As discussed, please clarify that there are no credit ratios beyond a ratio of 1:1, and the adaptive management proposal for developing ratios and revising the Program during subsequent years.

<p>Page 8, Purpose</p>	<p>“Provided PennDOT sustains a ledger of adequate accrued pollinator credits to offset the predicted annual effects of its program plus a required beneficial set aside, PennDOT will not be required to consult on the effects of its actions on the species relevant to the program.”</p>	<p>This statement is not accurate because the Policy has no mechanism to preclude consultation if a species is listed as endangered or threatened.</p> <p>The Policy (Section 3) states that the Service will consider the beneficial effects of a voluntary prelisting conservation action to be included as part of the environmental baseline during consultation for the agency action if requested by the action agency or, in the case of an agency action involving a permit applicant, by such applicant.</p> <p>Add: “The Service will consider credits as a measure to minimize and mitigate the impact of the taking of an endangered or threatened species pursuant to section 10(a)(1)(B) of the ESA, or as an intended compensatory measure of a proposed Federal agency action subject to the consultation requirements of section 7(a)(2) or 7(a)(3) of the ESA.”</p>
<p>Page 20, Section 4, last 2 paragraphs</p>	<p>“In the initial four years of monitoring, a rapid assessment monitoring protocol will be applied to 2.5% of ROW pollinator sites” and “It is estimated that these monitoring efforts will result in 1% of pollinator conservation actions being monitored through field visits.”</p>	<p>Please discuss the rationale behind the low percentage of monitoring sites, the rationale behind how monitoring sites will be selected, and the different monitoring scenarios across a diversity of habitats across the State.</p>

Thank you for your commitment to the conservation of pollinators in the State of Pennsylvania, specifically the Monarch, regal fritillary, and frosted elfin butterflies; and the yellow-banded bumblebee. We look forward to working with PennDOT to achieve our shared conservation goals.

If you have any questions or concerns regarding these comments, or the consultation process in general, please feel free to contact Jennifer Kagel at 814-206-7451.

Sincerely,

A handwritten signature in black ink that reads "Sonja Jahrsdoerfer". The signature is written in a cursive, flowing style.

Sonja Jahrsdoerfer
Project Leader

cc:
PennDOT – Zawisa



August 2, 2019

Sonja Jahrsdoerfer
Pennsylvania Field Office Supervisor
United States Fish and Wildlife Service
110 Radnor Road, Suite 101
State College, PA 16801

RE: PennDOT Voluntary Pre-Listing Pollinator Conservation Program

The Pennsylvania Department of Transportation (PennDOT) appreciates the United States Fish and Wildlife Service (USFWS) technical assistance for development of the PennDOT Voluntary Pre-Listing Program (the program) as detailed in the enclosed 2019 program document prepared in accordance with the USFWS *Policy Regarding Voluntary Pre-Listing Conservation Actions*, [Fish and Wildlife Service Manual at Part 735 \(5/31/2018\)](#). The voluntary conservation actions implemented under the program benefit the following species, known to Pennsylvania, that are being reviewed for listing under the ESA by the USFWS: the yellow banded bumblebee, monarch butterfly, regal fritillary and frosted elfin.

The program is a voluntary, non-regulatory, pro-active conservation endeavor pursued with the intent of preventing pollinator species of special concern from requiring federal protection under the Endangered Species Act (ESA) and the accrual of prelisting credits that may be used in the event any of these species are federally listed for the purpose of offsetting take resulting from transportation actions undertaken by PennDOT and the Federal Highway Administration (FHWA). PennDOT will administer the program and self-certify available credits with review and oversight of the PennDOT Pollinator Work Group. Written acknowledgement of the program and its consistency with USFWS policies and the ESA is requested.

Should you have any questions, please contact Mark Lombard at 717-772-2569 or email mlombard@pa.gov.

Sincerely,

A handwritten signature in black ink, appearing to read "George W. McAuley, Jr.", written in a cursive style.

George W. McAuley, Jr., P.E.
Deputy Secretary for Highway Administration

PennDOT Voluntary Pre-Listing Pollinator Conservation Program

Page 2

July 24, 2019

cc: Karen Anderson, USFWS
Robert M. Anderson, USFWS
Jennifer Kagel, USFWS
Jonathan Crum, FHWA
Drew Ames, PennDOT, BOPD-EPDS
Toni Zawisa, PennDOT, BOPD-EPDS



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Preamble

The Pennsylvania Department of Transportation (PennDOT) Voluntary Prelisting Pollinator Conservation Program (the program) is a voluntary, non-regulatory, pro-active conservation endeavor pursued with the intent of preventing pollinator species of special concern from requiring federal protection under the Endangered Species Act (ESA). The pro-active sentiment of conserving species in advance of regulatory needs is common with the objectives of the [2015-2025 Pennsylvania Wildlife Action Plan](#) which addresses these terrestrial invertebrate species regardless of the absence of an identified state regulatory agency for their protection.

The program has been developed as a living document with associated updates and resources accessible to the public at [2019 PennDOT Voluntary Prelisting Pollinator Conservation Program](#). The program was developed in conjunction with the interagency and stakeholder PennDOT Pollinator Work Group¹ who will continue to review and advise on program changes.

The Federal Highway Administration (FHWA), the lead federal agency for transportation actions in Pennsylvania, has encouraged the development of and fully supports the program. If federal protection under the ESA is determined warranted for species identified in the program and a species is listed as federally threatened or endangered, the program provides for offsetting credits that may be utilized by the FHWA and PennDOT in ESA consultations to mitigate the effects of transportation actions. The program was developed in accordance with USFWS *Policy Regarding Voluntary Pre- Listing Conservation Actions*, [Fish and Wildlife Service Manual at Part 735 \(5/31/2018\)](#). PennDOT administers the program and self-certifies available credits with review and oversight of the PennDOT Pollinator Work Group¹.

¹ A technical advisory board.



PennDOT Pollinator Work Group²

Dedication

Judith Aker, PennDOT Engineering District 8-0, deceased, served on the PennDOT Pollinator Work Group and brought her inspirations and passions for pollinators to the development of the 2019 PennDOT Voluntary Prelisting Pollinator Conservation Program.

Darren Altemose	PennDOT Engineering District 6-0
Raymond Boronyak	PennDOT Engineering District 5-0
Kurt Bond	Pheasants Forever
Sarah Cordek	PennDOT Bureau of Project Delivery
Jonathan Crum	Federal Highway Administration
Joseph Demko	PennDOT Bureau of Maintenance and Operations
Douglas Ford	Master Gardener
Pam Ford	Master Gardener
Christina Grozinger	Pennsylvania State University, Center for Pollinator Research
Michael Heitzenrater	PennDOT Engineering District 2-0
Steve Hichens	PennDOT Bureau of Project Delivery
Joseph Hovis	Pennsylvania Project Wingspan Coordinator
Jeffrey Jodon	Pennsylvania State University, PennDOT Roadside Project
Jennifer Kagel	United States Fish and Wildlife Service, Pennsylvania Field Office
Betsy Leppo	Western Pennsylvania Conservancy
Trilby Libhart	Pennsylvania Department of Agriculture
John Melham	Melham and Associates, PC
Harland Patch	Pennsylvania State University, Department of Entomology
Victoria Pocius	Pennsylvania State University, Center for Pollinator Research
Nicole Ranalli	United States Fish and Wildlife Service, Pennsylvania Field Office
Michael Retterer	Pheasants Forever, Ohio Pollinator Initiative, Project Wingspan
Karen Roccasecca	Pennsylvania Department of Agriculture
Bryon Ruhl	PennDOT Bureau of Project Delivery
Brian Walter	PennDOT Bureau of Maintenance and Operations
Carl Wesneski	PennDOT Bureau of Maintenance and Operations
Cyrille Whitson	Gannet Fleming, Inc.
Thomas Yocum	PennDOT Engineering District 9-0
Toni Zawisa ³	PennDOT Bureau of Project Delivery

² Representatives from inception in November 2017 – June 2019 are listed.

³ PennDOT Pollinator Work Group Coordinator



Executive Summary

The Pennsylvania Department of Transportation (PennDOT), a state transportation agency, operates and maintains an expansive statewide roadway network. The effects of PennDOT actions on pollinator species occur primarily because of disturbance and/or management practices that remove or eliminate habitat, particularly required host plants, permanently or temporarily within PennDOT right of way (PennDOT ROW). PennDOT ROW management also provides opportunities for increasing the availability of habitat for pollinators. The program establishes the commitment of the Federal Highway Administration (FHWA), a federal action agency, and PennDOT, its non-federal representative for consultation under the Endangered Species Act of 1973, to pursue voluntary pre-listing conservation credits for pollinator species that are not listed as threatened or endangered under the Endangered Species Act (ESA) but are reasonably certain to become listed in the foreseeable future for use on transportation project. The program also provides the requirements, terms and conditions for a voluntary pre-listing program in accordance with USFWS *Policy Regarding Voluntary Pre-Listing Conservation Actions*, Fish and Wildlife Service Manual at Part 735 (5/31/2018). The voluntary pre-listing conservation actions pursued under the program will be treated by the USFWS as measures to minimize, mitigate and/or as an intended compensatory measure to offset the taking of any of the species resulting from later, post-listing actions pursued by FHWA and/or PennDOT, provided PennDOT sustains a ledger of adequate accrued pollinator credits to offset the predicted annual effects of its program plus a required beneficial set aside. FHWA and PennDOT should be able to complete future ESA consultation requirements in an expedited and streamlined manner as a result of the program.

The voluntary conservation actions proposed under the program benefit the following species, known to Pennsylvania, that are being reviewed for listing under the ESA by the USFWS: the yellow banded bumblebee, monarch butterfly, regal fritillary and frosted elfin. By amendment, additional pollinator species may be added in the future. The authority for entering into the program includes: Sections 7(a)(2), 7(a)(3) of the ESA; Section 2002(a)(7) of the Pennsylvania Administrative Code of 1929, as amended, 71 P.S. §512(a)(7) and *Policy Regarding Voluntary Pre-Listing Conservation Actions*, Fish and Wildlife Service Manual at Part 735.

1. Voluntary Conservation Actions and Credits

- A. Conservation Actions. PennDOT may complete pollinator conservation efforts for habitat for the yellow banded bumblebee, monarch butterfly, regal fritillary and frosted elfin and receive offset credits for future projects that effect these pollinator species if they become listed under the ESA. These conservation efforts will focus on three principal approaches that hold the greatest potential for increasing habitat for these and other pollinator species in general:



- i. Increased implementation of conservation mowing seasons and methods;
- ii. continued implementation of daylighting rural routes to promote milkweed and nectar producing plant growth; and
- iii. implementation of planted pollinator sites by PennDOT, PennDOT partners and Adopt and Beautify groups.

These approaches will be applied to the rural road network right of way but not within safety clear zones or areas being vegetated with woody species. See Figure 2 for a definition of safety clear zones.

Implementation. PennDOT will administer the program through the Chief of the Environmental Policy & Development Section of the Bureau of Project Delivery (the Administrator). The Administrator will ensure that: the monitoring, credit verification and evaluation of effectiveness of voluntary conservation actions is completed; track debits and credits; make the program accessible to the public at [2019 PennDOT Voluntary Prelisting Pollinator Conservation Program](#); and report results annually to the PennDOT Pollinator Work Group. The PennDOT Pollinator Work Group is an existing interagency advisory task force of technical expert partners, to assist PennDOT in the development and oversight of a pollinator strategy and related initiatives, policies, guidance, best management practices, and pilot sites for habitat establishment.

In consultation with the USFWS and the PennDOT Pollinator Work Group, the Administrator will pursue actions to incorporate pollinator conservation measures in PennDOT policies; and pursue adaptive management revisions where necessary to the metrics, performance standards, monitoring and credit approval processes identified in the program. A GIS pollinator prioritization model and rapid assessment monitoring protocol recently developed through NCHRP Research Project 20-119 by Monarch Joint Venture, OK State U. and the Xerces Society, or similar, will be used to assist in prioritizing the locations of pollinator habitat efforts and for monitoring purposes.

- B. Monitoring. Monitoring will be conducted by PennDOT. PennDOT will submit the results of the monitoring in an annual report to USFWS. In the initial four years of monitoring, a rapid assessment monitoring protocol will be applied 2.5% of ROW pollinator sites to verify that the Thogmartin, et.al.⁴ milkweed stem density increases are accurate for Pennsylvania efforts. An emphasis will be placed on verification of the benefits of daylighting as a conservation measure as this best practice was not included in the Thogmartin, et. al. study. The initial year of monitoring efforts will be conducted on the 2016-2018 daylighting efforts discussed in the program. In all years, monitoring will also occur on a sub-sample of planted habitat sites, however, beyond the initial four years of monitoring, efforts will be limited to monitoring of planted pollinator habitat

⁴ Wayne E Thogmartin *et al* 2017 *Environ. Res. Lett.* 12 074005



sites only with a focus on nectar plant diversity and verification of host plants availability for the site-specific target species. It is estimated that these monitoring efforts will result in 1% of pollinator conservation actions being monitored through field visits annually.

C. Credits Received for Conservation Efforts. Reportable conservation efforts for the Monarch that occurred during the listing decision years of 2016-2018 and conceptual pollinator habitat conservation goals for future years are presented in the Monarch Voluntary Conservation Action Credit Ledger, Figure 6 of the program. The credits achieved in 2016-2018, are available to offset the effects of PennDOT actions to habitat for monarch butterfly. A net-benefit of 10% is proposed as set aside in accordance with the pre-listing policy. These credits are available immediately as part of the program. PennDOT will update Voluntary Conservation Action Credit Ledger, Figure 6, annually, for each of the species included in the program, based on the monitoring results and submit with the annual report to the PennDOT Pollinator Work Group and USFWS.

D. Service Areas, Voluntary Conservation Actions, and Credit Ratios for Species. The following are the service areas, conservation actions and credit ratios for each of the pollinator species included in the program.

1. Monarch Butterfly (Danaus plexippus plexippus):

- a. Service Area. All of Pennsylvania is in the historic and current range of the monarch. The credit service area for this species will be statewide.
- b. Voluntary Conservation Actions: Type, Location, Metrics, Performance Measures and Tracking.
 - i. Increased implementation of conservation mowing seasons and methods to be implemented on rural routes on the right sides of travel lanes beyond the safety clear zones.

Mowing type "F" as depicted in Figure 3 will be modified so that mowing occurs before May 1 or after October 1, or if mowing is required during the summer period it will be conducted from June 20 - July 10 to reduce mortality wherever possible as outlined in [FHWA-HEP-16-059, Roadside Best Management Practices that Benefit Pollinators](#). Mowing heights will be 8 - 12" to promote native plant establishment and reduce ground disturbance for other ground nesting pollinators. PennDOT, extracting data from its ePayroll reporting system (as detailed in Publication 113, Highway Foreman's Manual) will monitor and report milkweed stem-based credits and impacts associated



with this conservation action annually with updates to the data presented in Figure 6, Monarch Voluntary Conservation Action Credit Ledger. Reporting as an impact will occur if the date of mowing is other than during the conservation mowing periods.

- ii. Implementation of daylighting on rural routes with dense canopy cover to promote milkweed and nectar producing plant growth will continue to be planned and implemented by PennDOT Districts and Counties.

PennDOT, extracting data from its ePayroll reporting system will monitor and report milkweed stem-based credits and impacts associated with this conservation action annually with updates to the data presented in Figure 6. Conservation efforts of this type will also be uploaded to the USFWS Monarch Conservation Database annually for tracking purposes.

- iii. Implementation of planted pollinator habitat sites by PennDOT, PennDOT partners and Adopt and Beautify groups will occur with the implementation of the following performance measures:
 1. Sites will be screened for suitability with the assistance of technical experts and GIS prioritization modeling.
 2. A baseline host plant milkweed density and a nectar producing species richness (number of nectar producing species observed) will be documented.
 3. The planted area will be measured and the implementation methods including site preparation, planting methods, seed mixes, and a site maintenance will be documented.
 4. A sign or signs identifying the planted area as a pollinator habitat will be erected to advise the public of the pollinator effort.
 5. Post effort monitoring will be performed utilizing a rapid assessment protocol that at a minimum provides a post effort milkweed stem density and nectar producing species richness. The presence of milkweed and at least two other nectar producing plant species will be identified for the site to be considered credit-worthy. Sites not achieving these measures will not be reported as credits in the annual program reporting.
 6. The presence of invasive species, any site disturbances and the need for implementation of any post effort maintenance measures will be identified in the monitoring reporting.
 7. If activities occur on any site that are inconsistent with maintaining the site



in conservation pollinator habitat, the site credits will be removed from the credits reported as an update to Figure 6 and documentation of the removal will be identified in the program level annual report. These activities would include conversions of the habitat to other land uses such as buildings or road improvements, or mowing occurring outside the conservation mowing method identified in (4)(b)(i).

8. Conservation efforts of this type will also be uploaded to the USFWS Monarch Conservation Database annually for tracking purposes.
 - c. Credit Ratio. The following ratios will be applied to credits yielded from conservation efforts beginning in 2019: a 1.5:1 ratio to credits in PennDOT Districts 1-0 (all counties), 2-0 (McKean, Elk, Cameron, Clinton, Potter, and Clearfield), 3-0 (Tioga, Lycoming and Sullivan), 9-0 (Cambria and Somerset), 10-0 (all counties), 11-0 (all counties) and 12-0 (all counties); a 1.25:1 ratio to District 2-0 (Centre, Mifflin and Juniata), 3-0 (Union, Montour, Columbia, Snyder and Northumberland), and 9-0 (Blair, Bedford, Huntingdon and Fulton) and a 1:1 ratio for efforts in all remaining PennDOT Districts and counties.
2. Yellow Banded Bumblebee (*Bombus terricola*):
 - a. Service Area. The credit service area for this species will be statewide.
 - b. Voluntary Conservation Actions: Type, Location, Metrics, Performance Measures and Tracking. Implementation, metrics, performance measures will be performed as detailed for the Monarch with the following modification: The nectar producing plants present post effort must include at least one of the following: blueberry (*Vaccinium*), willow (*Salix*); Rose (*Rosa*), blackberry and raspberry (*Rubus*); Honeysuckle (*Lonicera*); Goldenrod (*Solidago*); or asters.
 - c. Credit Ratio. A Voluntary Conservation Action Credit Ledger, specific to the yellow-banded bumblebee will be developed and included in the program level annual reports for the purposes of tracking credits and impacts. No credit ratios are proposed for this species.



3. Regal Fritillary (*Speyeria idalia*)

- a. Service Area. The credit service area will be limited to the following counties: Adams; Beaver; Bucks; Butler; Centre; Chester; Clearfield; Cumberland; Dauphin; Delaware; Huntingdon; Lancaster; Lebanon; Monroe; Montgomery; Philadelphia; Westmoreland and any other county where this species is found through new survey data.
- b. Voluntary Conservation Actions: Type, Location, Metrics, Performance Measures and Tracking. Implementation, metrics, performance measures will be performed as detailed for the Monarch with the following modification: The presence of the required violets, a minimum of 30% aerial cover of native warm season bunch grasses and at least two other nectar producing plant species of which at least one species must be common milkweed (*Asclepias syriaca*); orange/butterfly milkweed (*A. tuberosa*); pasture thistle (*Cirsium pumilum*); or field thistle (*C. discolor*) will be identified for the site to be considered credit-worthy. Sites not achieving these measures will not be reported as regal fritillary credits in the annual program reporting.
- c. Credit Ratio. A Voluntary Conservation Action Credit Ledger, specific to the regal fritillary will be developed and included in the program level annual reports for the purposes of tracking credits and impacts. No credit ratios are proposed for this species.

4. Frosted Elfin Butterfly (*Callophyrus irus*)

- a. Service Area. All of Pennsylvania is in the historic range of the frosted elfin and the service area will be Commonwealth-wide.
- b. Voluntary Conservation Actions: Type, Location, Metrics, Performance Measures and Tracking. Implementation, metrics, performance measures will be performed as detailed for the Monarch with the following modification: The presence of one of the wild indigo and lupine plants and at least two other nectar producing plant species will be identified for the site to be considered credit-worthy. Sites not achieving these measures will not be reported as frosted elfin credits in the annual program reporting.
- c. Credit Ratio. A Voluntary Conservation Action Credit Ledger, specific to the frosted elfin will be developed and included in the program level annual reports for the purposes of tracking credits and impacts. No credit ratios are proposed for this species.



- E. Listing of the Species. When a species is listed as threatened or endangered under the ESA, the parties will develop an expedited consultation process for utilizing the available credits and satisfy the ESA requirements.

II. Amendments and Modifications

- A. Adaptive Modifications. PennDOT's pollinator conservation efforts are continuously evolving as the state of science, innovative technologies, protocols and policies develop. In addition, PennDOT through its research efforts, will continue to explore herbicide applications and seed mixes that promote native vegetation and minimize harm to pollinator species. The proposed conservation efforts will be modified in an adaptive management manner as monitoring results identify the need for adjustment, new opportunities present. In consultation with the USFWS and the PennDOT Pollinator Work Group, the Administrator will make changes where necessary to the metrics, performance standards, monitoring and credit approval processes identified in the program. Proposed modifications will be vetted by the PennDOT Pollinator Work Group.
- B. Amendments. Any proposed changes, corrections, or additions to the program, including those discussed in Section II.A or the inclusion of additional pollinator species, will be coordinated through the PennDOT Pollinator Work Group. These alterations, if agreed in by the work group, will be made via addendum or revision to the program and the update provided at [2019 PennDOT Voluntary Prelisting Pollinator Conservation Program](#).



Pennsylvania Department of Transportation

Voluntary Prelisting Pollinator Conservation Program

Purpose

This program establishes the commitment of the FHWA, a federal action agency, and PennDOT, its non-federal representative for consultation under the Endangered Species Act of 1973, to pursue voluntary pre-listing conservation credits for pollinator species that are not listed as threatened or endangered under the ESA but are reasonably certain to become listed in the foreseeable future. The program also provides the requirements, terms and conditions for the voluntary pre-listing program in accordance with USFWS *Policy Regarding Voluntary Pre-Listing Conservation Actions*, [Fish and Wildlife Service Manual at Part 735 \(5/31/2018\)](#). The voluntary pre-listing conservation actions pursued under this program will be treated by the USFWS as measures to minimize, mitigate and/or as an intended compensatory measure to offset the taking of any of the species resulting from later, post-listing actions pursued by FHWA and PennDOT. Provided PennDOT sustains a ledger of adequate accrued pollinator credits to offset the predicted annual effects of its program plus a required beneficial set aside, PennDOT will not be required to consult on the effects of its actions on the species relevant to the program.

The yellow banded bumblebee, monarch butterfly, regal fritillary and frosted elfin are the initial pollinator species included in this program. By amendment, additional pollinator species may be added in the future.

Authorities

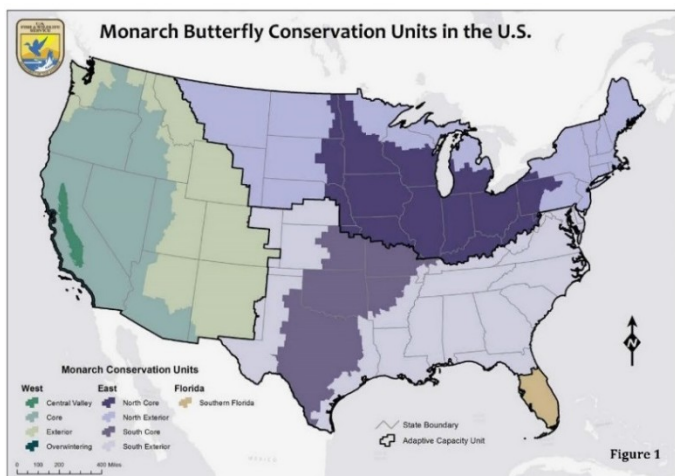
Sections 7(a)(2), 7(a)(3) of the Endangered Species Act.

Policy Regarding Voluntary Pre-Listing Conservation Actions, [Fish and Wildlife Service Manual at Part 735](#)
Section 2002(a)(7) of the Pennsylvania Administrative Code of 1929, as amended, 71 P.S. §512(a)(7).

Species Descriptions

Monarch Butterfly (*Danaus plexippus plexippus*)

The USFWS is finalizing a Species Status Assessment (SSA) and 12-month finding on a petition to list the monarch butterfly. Additional information on this species, threats to the species and the SSA are available at <https://www.fws.gov/savethemonarch/ssa.html>. All of Pennsylvania is in the current and historic range of the monarch.



The USFWS has defined three population units and nine conservation units for this species. Western Pennsylvania is in the North Core Conservation Unit for the eastern monarch population while eastern Pennsylvania is in the North Exterior Unit (Figure 1). The primary threats to the eastern population relevant in these conservation units are:

- Changes in milkweed and nectar abundance; and
- Herbicide exposure (glyphosate)

Offsetting conservation measures include compatible management in rights-of-way (ROW), reductions in glyphosate use and increases in milkweed and nectar habitats.



Yellow Banded Bumblebee (*Bombus terricola*)

The USFWS has completed a Species Status Assessment (SSA) http://www.xerces.org/wp-content/uploads/2009/03/xerces_2008_bombus_status_review.pdf and is completing a 12-month finding on a petition to list the yellow banded bumblebee. Additional information on this species can be found at <https://xerces.org/yellow-banded-bumble-bee/> and <https://www.fws.gov/midwest/es/soc/Batch90DayMarch2016.html>.

All of Pennsylvania is within the historic range of the yellow banded bumblebee. The primary threats to this species relevant to PennDOT actions are the loss of native grassland habitats with native nectar and pollen plants, the use of insecticides and disturbances to ground nesting locations. In general conservation measures implemented for the monarch butterfly will benefit the yellow banded bumblebee, however, measures to protect ground nest sites and development of habitat that include its preferred food plants is important. Food plants for this species are: blueberry (*Vaccinium*), willow (*Salix*); Rose (*Rosa*), blackberry and raspberry (*Rubus*); Honeysuckle (*Lonicera*); Goldenrod (*Solidago*); and asters.

Regal Fritillary (*Speyeria idalia*)

The USFWS has scheduled a 12-month review in 2022 for the regal fritillary. Additional information on this species can be found at, <http://www.naturalheritage.state.pa.us/ccvi/regal%20fritillary.pdf>, <http://www.naturalheritage.state.pa.us/factsheets/11757.pdf> and <https://xerces.org/regal-fritillary/>. Historic records for this species exist for sixteen counties in the Commonwealth with current records in only four counties. The largest population in the state is at Fort Indiantown Gap National Guard Training Center. The primary threat to this species is habitat loss. Native warm season bunch grass habitat with an abundance of required violet food plants and nectar sources is required. Preferred nectar source plants include: Common milkweed (*Asclepias syriaca*); orange/butterfly milkweed (*A. tuberosa*); pasture thistle (*Cirsium pumilum*); and field thistle (*C. discolor*). Conservation measures for this species would need to focus on these specific species requirements.

Frosted Elfin Butterfly (*Callophyrus irus*)

The USFWS has proposed conducting a discretionary status review for the frosted elfin in 2023. A [Species Status Assessment Report](#) was completed and contains additional information on this species. All of Pennsylvania is within the historic range of the frosted elfin. This species is found in oak-pine barrens, dry oak woodlands and similar habitats such as powerline cuts, old sand/gravel pits and similar habitats. The host plants, wild indigo and wild lupine rely on disturbance resulting in semi-open habitats with partial to full sunlight. Most populations known to Pennsylvania rely on wild indigo (*Baptisia tinctoria*) as a host plant, however lupine (*Lupinus*) may also be used. Frosted elfin remain within suitable habitat patches and are non-migratory. Habitat loss and degradation is the primary threat to the species. Habitat loss has occurred as the result of development, conversion to agriculture, barren and native shrublands reverting to shade tolerant woodlands due to fire suppression and invasive plant species outcompeting the native host plants. Vegetation management including selective tree cutting and late season mowing to promote host plant and nectar producing plants in barren habitat regions might increase available habitat for this species.

PennDOT Transportation Actions

PennDOT, a state transportation agency, operates and maintains an expensive statewide roadway network (Table 1). Refer to PennDOT's [Fact Book](#) for additional information about PennDOT's transportation products and services.

In its typical role as non-federal representative for Section 7 consultations under the Endangered Species Act, PennDOT has developed project specific and programmatic biological assessments. For descriptions of PennDOT



actions for this pre-listing program refer to *Federal Highway Administration, Federal Railroad Administration, and Federal Transit Administration Programmatic Biological Assessment for Transportation Projects in the Range of the Indiana Bat and Northern Long-Eared Bat (November 28, 2016)*; the *Federal Highway Administration and Pennsylvania Department of Transportation Programmatic Biological Assessment for the Effects of Transportation Actions on the Bog Turtle Within the Commonwealth of Pennsylvania*; [Pub 23 Maintenance Manual](#) and [Pub 113 Highway Foreman Manual](#).

The effects of PennDOT actions on pollinator species occur primarily because of disturbance and/or management practices that remove or eliminate habitat, particularly required host plants, permanently or temporarily within PennDOT ROW. PennDOT ROW management also provides opportunities for increasing the availability of habitat for pollinators.

In general, Transportation Improvement Plan (TIP) projects result in temporary effects to ROW as same or similar ROW conditions are generally restored at the completion of the project. Linear projects on the TIP¹ from 2019 – 2022 were analyzed and it is estimated that approximately 1600 acres of ROW and less than 93,000 milkweed stems may potentially be temporarily affected by these projects in total. PennDOT ROW mowing practices were similarly evaluated. Mowing conducted from April 1 – October 1 may affect pollinator species through the removal of required host and nectar producing plants during the active season. Mowing of ROW in herbaceous vegetation beyond required clear zones during this seasonal period was estimated to result in effects to approximately 6,000 acres and 348,000 milkweed stems annually. This analysis is based on a five-year average from 2014 – 2018. Trends toward reduced and early/late season mowing over the five-year period are indication that the effect may be overestimated.

Table 1. Summary of 2017 State-Maintained Road Miles

PENNDOT ENGINEERING DISTRICT	TOTAL STATE-MAINTAINED ROAD MILES
1 – 0	3,689
2 – 0	3,485
3 – 0	5,037
4 – 0	2,820
5 – 0	3,291
6 – 0	3,580
8 – 0	5,230
9 – 0	3,748
10 – 0	3,129
11 – 0	2,165
12 – 0	3,594

¹Excludes bridge projects



PennDOT ROW Description

Excluding state-maintained roadways in urban² settings, where pollinator habitat is unlikely, PennDOT maintains approximately 21,911 roadway miles. It is roughly estimated that a minimum of 58,007³ acres of ROW are associated with these rural road miles. Approximately 22% (29,190 acres) of this acreage is designated as requiring single-pass, Type L mowing⁴ for safety purposes and, as such, milkweeds and nectar producing plants required for pollinators are not present due to regular maintenance including deicing, snow removal and mowing. This ROW acreage is unsuitable habitat for pollinator species. The remaining ROW acreage is preserved land that provides pollinator habitat and opportunities for increases in pollinator habitat on a land cover dependent basis.

The Natural Resource Conservation Service (NRCS) designates ROW as developed land, however, these ROW corridors beyond the required mowing identified above are principally preserved lands in broad non-farming rural land cover/use. NRCS (2018)⁵ reported that approximately 67% of the all rural land in Pennsylvania is forestland generally defined as consisting of any single-stemmed woody species of any size that will be at least 13 feet tall at maturity. They also report that pastureland, that is all land having vegetative cover of grasses, legumes, and/or forbs, regardless of whether it is being grazed by livestock, exists at less than 1% of all rural land in the Commonwealth. Land, meeting the pastureland definition used by NRCS, exists in greater abundance on PennDOT ROW but by how much has not been quantified. Similarly, due to PennDOT safety concerns regarding the presence of woody vegetation, particularly within Interstate and other freeway/expressway medians, less than 67% of the ROW for these road types is forestland. For estimating purposes, PennDOT proposes to describe the land cover within the state maintained rural ROW as forestland, grass/forbs⁶ and other (1%) as further presented in Table 2.

²Urban and rural areas are defined by AASHTO, in *A Policy on Geometric Design of Highways and Streets* (2011), with urban areas being those areas within boundaries established by state and local officials having populations of 5,000 or more, and rural being all other. From a road geometric design perspective routes in urban areas have distinctive characteristics (such as curbs) not utilized in roadway design in rural settings. Figures 1.1 and 1.2 in [PennDOT Publication 13M, Design Manual Part 2: Highway Design](#) provide additional descriptions of urban and rural.

³Estimated using these generalized ROW widths (excluding cartways): Interstate = 140', Other Freeway/Expressway and Principal Arterials = 32', and Minor Arterials/Major and Minor Collectors = 14'. ROW is wider in some areas. This is an estimate of the minimum ROW.

⁴Estimated as a total of 30' width on Interstates and 10' width on all other road types.

⁵U.S. Department of Agriculture. 2018. *Summary Report: 2015 National Resources Inventory*, Natural Resources Conservation Service, Washington, DC, and Center for Survey Statistics and Methodology, Iowa State University, Ames, Iowa. <http://www.nrcs.usda.gov/technical/nri/15summary>



Table 2. PennDOT Maintained Rural ROW Estimates

Function Class	Linear miles	TOTAL ROW acres	Total minus L mow zones acres	Forest %	forested acres ROW	grass/forbs %	grass/forb ROW acres
Interstate	1,087	18,446	14,494	33	4,783	66	9,566
Other Freeway/Expwy	344	1,334	918	33	303	66	606
Other Principal Arterial	1,593	6,178	4,248	66	2,804	33	1,402
Minor Arterial	4,590	7,789	2,226	66	1,469	33	735
Major Collector	7,337	12,450	3,557	66	2,348	33	1,174
Minor Collectors	6,960	11,810	3,374	66	2,227	33	1,113
TOTAL PennDOT maintained roughly estimated ROW	21,911	58,007	28,817		13,933		14,596

Pre-Listing Program Requirements

1. Beneficial to Unlisted Species

The species addressed by this program are not federally listed at the time of signing and all actions pursued as part of this program are voluntary actions that are not required under the ESA or any other law, regulation, permit or regulatory mechanism.

The voluntary conservation actions proposed under this program benefit the following species, known to Pennsylvania, that are being reviewed for listing under the ESA by the USFWS.

Monarch Butterfly (*Danaus plexippus plexippus*)

On December 31, 2014, USFWS published, in the [Federal Register, a 90-day finding](#) that a petition to list the *plexippus* subspecies of the monarch butterfly presented substantial information indicating that listing the species may be warranted. USFWS has initiated a species status review and will prepare a species status assessment (SSA) report, which will support a 12-month finding. As part of a court approved settlement agreement, USFWS must complete the status review and publish a listing determination for the monarch butterfly in the Federal Register no later than December 15, 2020.

Yellow Banded Bumblebee (*Bombus terricola*)

On March 16, 2016, USFWS published, in the [Federal Register, a 90-day finding](#) that a petition to list the yellow banded bumblebee presented “substantial information” indicating that listing the species may be warranted. Potential threats to the species include habitat loss, degradation, and modification primarily the result of agricultural practices and urban development, disease, inadequacy of existing regulatory mechanisms, and other natural or manmade factors including climate change and the use of pesticides. USFWS has initiated a species status review and will prepare an SSA report, which will support a 12-month finding. As part of the National Listing Workplan USFWS expects to complete the SSA and resulting 12-month finding in FY 2019.

⁶ Equivalent to the NRCS definition for pastureland.



Regal Fritillary (*Speyeria idalia*)

The USFWS published a [90-day finding in the *Federal Register*](#) on September 18, 2015 announcing that it would initiate a species status review for the regal fritillary. The completion of the SSA report will support a 12-month finding. USFWS expects to complete the SSA and resulting 12-month finding in FY 2022.

Frosted Elfin Butterfly (*Callophyrus irus*)

The USFWS is proactively pursuing a species status review to inform a conservation strategy, including whether the species may warrant listing under the ESA. USFWS expects to complete the SSA and resulting 12-month finding in FY 2023.

2. Conservation Strategy Programs.

PennDOT efforts are undertaken as part of State- or multi-State administered programs that implement conservation strategies for pollinator species. The conservation strategy umbrellas we operate under are: 1) the Federal Strategy; 2) the FAST Act; 3) the 2015 – 2025 Pennsylvania Wildlife Action Plan; and 4) the Pennsylvania Pollinator Protection Plan (P4). The latter also meets the requirement for a multi-agency/stakeholder effort as does the PennDOT Pollinator Work Group.

The 2014 Presidential Memorandum, [Creating a Federal Strategy to Promote the Health of Honey Bees and other Pollinators](#), directed the Department of Transportation to work with state Departments of Transportation to identify opportunities to increase pollinator habitats, promote pollinator-friendly practices and corridors. Prior to 2014 the FHWA Environmental Stewardship initiative had provided some opportunity for implementing pollinator habitats. Post-2014 there was a firmer basis to develop pollinator action and education plans, and to develop public/private partnerships to implement proactive pollinator conservation efforts as various cabinet agencies responded to the federal strategy with the integration of pollinator health and conservation with achieving their primary missions and various state agencies followed suit. In respect to transportation agencies, in late 2015, the [Fixing America's Surface Transportation Act \(FAST Act\)](#) was signed. This act further directs the Secretary of Transportation to use existing authorities, programs and funding to encourage pollinator habitat efforts through reduced mowing and integrated vegetation management (IVM) practices by willing State DOT's, including PennDOT.

The Pennsylvania Department of Agriculture (PDA) and its contractor, the Pennsylvania State University, Center for Pollinator Research, recognizing the need to address the challenges facing pollinator populations observed in Pennsylvania and identified the *Federal Strategy*, initiated the development of the [Pennsylvania Pollinator Protection Plan \(P4\)](#). With the assistance of an eighteen-member Task Force and a twenty-member Advisory Board, the P4 was completed and is maintained as a living document that can be updated to address latest information, opportunities and challenges. PennDOT participated on the Advisory Board. Included in the P4 are guidelines for pollinator habitat planning to preserve, restore and expand habitat for these species in roadside Rights-of-Way (ROW). These guidelines are summarized as:

- a. Build a coordinated network of individuals and groups interested in restoring and maintaining pollinator habitat through the PennDOT “Adopt and Beautify” and “Sponsor a Highway” programs.
- b. Utilizing site selection criteria, evaluate potential sites and select optimal site.
- c. Develop a restoration and management plan, with clear expectations for timelines, budgets and goals.
- d. Provide a diversity of plants that provide nectar and pollen resources throughout the growing season, as well as plants that serve as food sources for caterpillars of key pollinator species (such as milkweeds for monarch butterflies) within ROWs.
- e. Develop strategies for controlling invasive plant species at appropriate levels. Up to 20% of plants could be non-native species at pollinator habitat sites before management is required may be generally



- appropriate.
- f. Provide nesting habitat for pollinators, such as areas with bare soil for ground-nesting species.
 - g. Roadsides and ROWs will require periodic mowing. Develop a plan that ensures the needs of stakeholders are met while optimally supporting pollinators. For example, mowing once a year in the fall – after bloom - may reduce negative impact on pollinators, reduce the presence of invasive species, while ensuring visibility and safety. Alternatively, sections can be mowed at various times, to ensure that some flowering plants and habitat are always intact.
 - h. Use an “Integrated Vegetation Management” and “Integrated Pest Management” approach to reduce the use of herbicides and pesticides in these areas, while still maintaining populations of invasive plant species and insect pests at below threshold levels. Refer to PennDOT Publication 756, [Invasive Species Best Management Practices](#).
 - i. Develop an evaluation plan to document the success of the restoration and maintenance efforts.
 - j. Celebrate the success of the management plan through social media and events, to encourage other organizations to participate in similar efforts.

The [2015 – 2025 Pennsylvania Wildlife Action Plan](#), approved the USFWS, provides a statewide conservation strategy for Species of Greatest Conservation Need (SGCN) in Pennsylvania. The plan outlines a proactive conservation strategy for these species with a goal of implanting adequate conservation protections such that federal listing of these species under the ESA does not become necessary. Specific conservation actions for terrestrial invertebrates are included in the plan. A clear, consistent and transparent process for evaluating species conservation status and prioritizing SGCN species was included. The SGCN rankings for the yellow-banded bumblebee, frosted elfin, regal fritillary and monarch are presented in Table 3. Habitat enhancement through the planting of milkweed and other native wildflowers; and species and habitat monitoring are conservation actions included for the monarch and other SGCN pollinators in the action plan.

Table 3. Pennsylvania Wildlife Action Plan SGCN Priorities.

Prioritization Categories: (1) Contribute to the conservation of globally or regionally important species; (2) Prevent common species from becoming at risk; (3) Maintain rare native species; (4) Reduce knowledge gaps to better assess conservation status of species. Species scoring a 1, 2, or 3 in any category are the highest priorities for focused conservation action. ^RPennsylvania responsibility species.

Taxonomic Group	Common Name	Scientific Name	Combined Global and State Ranks	FINAL SCORE Category 1	FINAL SCORE Category 2	FINAL SCORE Category 3	FINAL SCORE Category 4
Bees	Yellow-banded Bumblebee ^R	<i>Bombus terricola</i>	G2G4S1S3	4	5	2	3
Butterflies	Frosted Elfin	<i>Callophrys irus</i>	G3S1S2	2	6	2	2
	Regal Fritillary ^R	<i>Speyeria idalia</i>	G3S1	2	5	2	5
	Monarch	<i>Danaus plexippus</i>	G4S2S4	5	6	3	3



3. Conservation Programs Operational Prior to Publication of a Proposed Rule to List the Species in the Federal Register.

PennDOT's Established Conservation Programs

Pennsylvania has greater than 40,000 road miles and PennDOT manages the ROW associated with most of these road miles. Roadside ROW can provide nesting and foraging habitat in corridor configurations that serve to improve habitat connectivity and provide “way station” patches for migrating pollinator species. In the urban and agricultural landscapes, ROW may offer the only opportunity for natural habitat preservation. To support the preservation of desirable roadside vegetation, PennDOT officially implemented Integrated Vegetation Management (IVM) in 2007. The basic principles of the IVM program are described in [IVM FAQs](#) and [PennDOT Pub 23 Chapter 13](#). To support efforts to eradicate or control undesirable vegetation growth, in May 2014, PennDOT released [Pub 756, Invasive Species Best Management Practices](#) for use by PennDOT forces and contractors.

Beginning in 1985 and ongoing for thirty-two years, PennDOT has funded a cooperative research project with the Pennsylvania State University College of Agricultural Sciences, Department of Plant Science to advise its roadside vegetation management program. Annual reports and associated publications are available at [PennDOT/PSU Cooperative Roadside Research](#). Studies focus on all aspects of roadside vegetation management within the PennDOT IVM program. The goals are the preservation of desirable vegetation, minimization of undesirable vegetation and an aesthetically pleasing roadside environment. The 2017 annual report includes the results of the study, *The Effects of Commonly Used Herbicides on Common Milkweed (Asplepias syriaca)*, Johnson, Despot and Sellmer, 2017. This study evidences interest and initiative to preserve and enhance pollinator preferred vegetation.

On November 16, 2017, PennDOT held the first meeting of the PennDOT Pollinator Work Group, an interagency advisory task force of technical expert partners, to assist PennDOT in the development of a pollinator strategy and related initiatives, policies, best management practices, pilot sites for habitat establishment, and guidance. Recent emphasis on the conservation of pollinator species within transportation facilities by the Federal Highway Administration (FHWA), the development of a state Pollinator Plan, USFWS consideration of multiple pollinator species for listing as threatened or endangered and increasing public interest in pollinator conservation within highway rights-of-way had prompted PennDOT to initiate this effort.

The PennDOT Pollinator Work Group has identified four focus areas, consistent with the P4 guidelines, for integration of pollinator conservation into PennDOT missions:

- a. PennDOT acceptance of a general plan/policy that will provide a simple reference for public inquiries and to use to promote and market to Adopt & Beautify partners. The [PennDOT Pollinator Habitat Plan](#) was publicly introduced by PennDOT via a [press release](#) on March 19, 2019 .
- b. Update [Pub 461, Roadside Planting Guidebook](#) and roadside related maintenance practices, identified in [Pub 23, Maintenance Manual, Chapter 13, Roadside Management](#) and Pub 113, [Highway Foreman Manual](#) with pollinator-friendly aspects. Some pollinator A new publication, [Pub 808, Roadside Beautification Manual](#), now identifies the [Adopt and Beautify Program](#) as an opportunity for community organizations to partner with PennDOT to develop roadside pollinator habitat.
- c. Develop a programmatic ESA pre-listing program to address endangered species compliance, plan for, and provide pre-listing credits for future Section 7 consultation project and maintenance action mitigation needs.
- d. Identification of initial pilot or trial sites as opportunities arise. Pollinator habitat development is possible by community groups submitting plans through the PennDOT Adopt and Beautify Program. The



establishment of additional habitat sites will be pursued with assistance from PennDOT Pollinator Work Group partners including [Pheasants Forever](#) and [Project Wingspan](#) Coordinators.

PennDOT continues to advance initiatives to fulfill these four focus areas. In addition, efforts to apply for grant funding to support these advancements are ongoing. The PennDOT Pollinator Work Group has expanded its partnership to include representation from other state DOTs and partners with pollinator habitat experience to expedite advancement of pollinator habitats and BMPs in Pennsylvania. Most notable is the assistance being provided by the Ohio Pollinator Initiative.

Current PennDOT Operations Generating Conservation Benefits

Roadside ROW management is multifaceted and numerous management practices can be applied that result in conservation benefits. Not all practices are appropriate for all roadways or roadway associated facilities.

Thogmartin, et. al. identified conservation grazing, conservation mowing, early successional habitat development/management, establishment of field borders, herbicide treatments to enhance pollinator habitat, implementation of Integrated Vegetation management (IVM), planting and prescribed burning as conservation practices applicable to roadway ROW. Within Pennsylvania, sometimes referred to as “Penns Woods”, daylighting of rural routes through tree cutting is another practice that results in increased pollinator habitat.

The USFWS developed a [Monarch Conservation Database](#) for tracking monarch conservation efforts nationally and encouraged land management organizations and entities to provide information regarding pollinator habitat conservation efforts beneficial to the monarch butterfly. PennDOT data for some land management activities is collected in units that were not transferrable, for example contracted mowing is collected in man hours. PennDOT was able to report monarch habitat gains realized through daylighting projects. PennDOT reported 322 conservation efforts of this type from 2016-2018.

Table 4. Reported Pre-listing Conservation Credits 2016-2018

Year	Acres	Baseline Milkweed Stem Density	Post-Effort Milkweed Stem Density	Net Increase Milkweed Stems
2016	665	38,027	102,264	64,237
2017	1840	105,129	291,542	186,412
2018	988	56,462	150,509	94,047
TOTAL	3493	199,618	544,315	250,649
Annual Average	1164	66,539	181,438	125,325

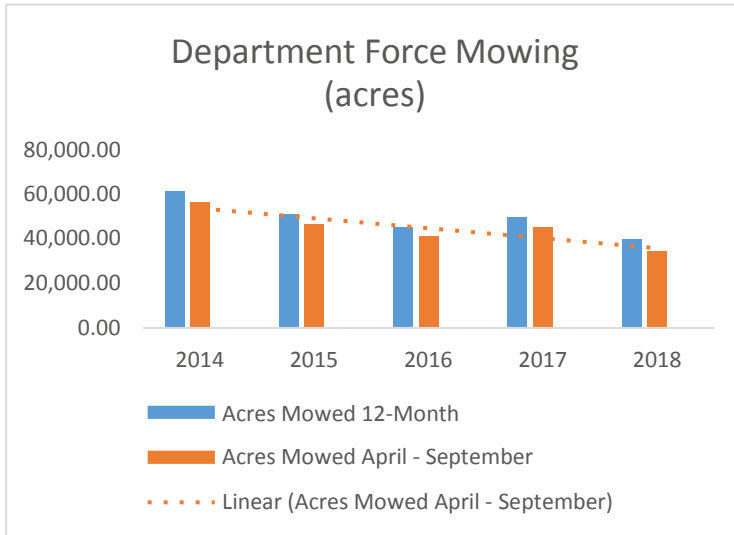
In managing roadside ROW for pollinators, PennDOT must first assure that traffic safety needs are met. Roadside mowing is an essential component of the PennDOT IVM program and essential for assuring motorist safety and sign visibility. Safety clear zones, generally extending thirty feet from the edge of roadway, must be maintained for adequate sight distance and visibility, resulting in more frequent mowing and/or maintenance of low growth within this zone. Woody plant control is critical in these areas. Figure 2 depicts the woody plant control zone standard practiced by PennDOT. PennDOT mowing policies and procedures are detailed in [Pub 23, Chapter 13](#).

Mowing is a costly activity and budgetary reductions are realized when mowing is conducted only where and as



frequently as necessary in concert with other IVM procedures. PennDOT utilizes both in-house personnel, referred to as “Department Forces”, and contracts to conduct mowing. Contract mowing costs in PennDOT District 6-0 are reported to be \$50/acre per cycle. In this heavily developed District in Southeast Pennsylvania, four cycles of mowing are implemented to address public demands and expectations, resulting a total cost of \$200/acre annually. One to two mowing cycles are typical in other areas of the Commonwealth. District 5-0 is another PennDOT region that extensively utilizes contract mowing. The mowing scope in the contracts in District 5-0 is predominantly fall mowing focused. This identifies that implementation of conservation mowing/late season mowing is achievable and represents a significant potential for conservation gains in the future.

Table 5. Reductions in Department Force Mowing



Department Force mowing operations are reported and tracked in acre units. Contract mowing is reported and tracked in man hours. This difference in reported units resulted in an inability for PennDOT to analyze and report within the Monarch Conservation Database (MCD) in 2018, during USFWS pre-listing data collection, what appears to be a trend to decreased mowing in PennDOT Districts. Data analysis identified reductions in Department Force mowing occurring during the months when milkweed availability for Monarch is critical. The percentage of all Department Force mowing conducted earlier than April 1 or after September 30 increased by over 5% during the five-year period from 2014 through 2018. It is unlikely,

given the cost of contract mowing, that this trend is indicative of increases in contract mowing. No increased numbers in contracts issued were identified and some Districts do not pursue any contract mowing. Seasonal climate variations and expanded use of Department Forces for other road rehabilitation duties influence how much mowing occurs during the spring/summer versus later season in a given year. The conservation benefits of these reductions were not reported in the MCD, but an unquantifiable conservation benefit was realized. The data does demonstrate that reductions in Department Force mowing during critical periods are achievable and represent significant conservation benefit potential.

PennDOT guidance identifies that efficient mowing operations are conducted in combination with herbicide application. Figure 3 provides the mowing types and standard limits for each type. Mowing occurs only for the purposes of controlling invasive species and woody growth beyond the non-selective and safety clear zones resulting in considerable opportunity for pollinator habitat conservation.



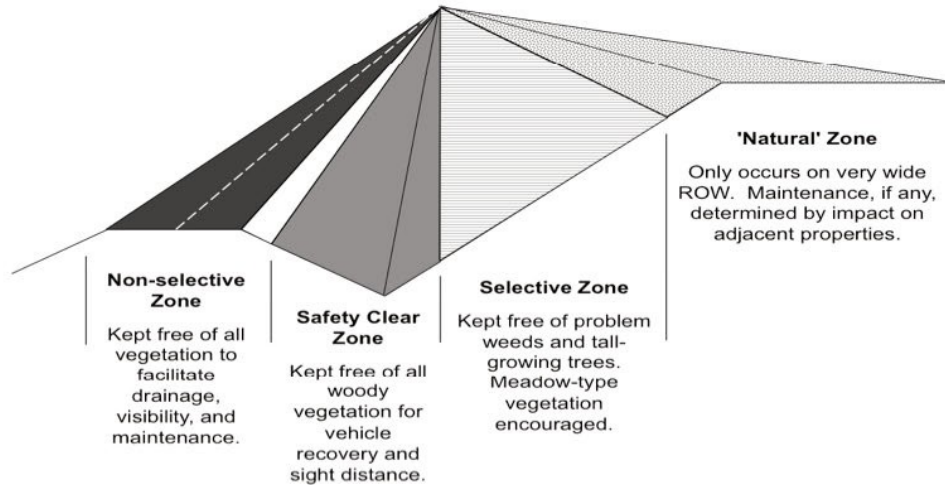
Figure 2

STANDARD LIMIT~ WOODY GROWTH

Zone Concept

(Planted or Volunteer)

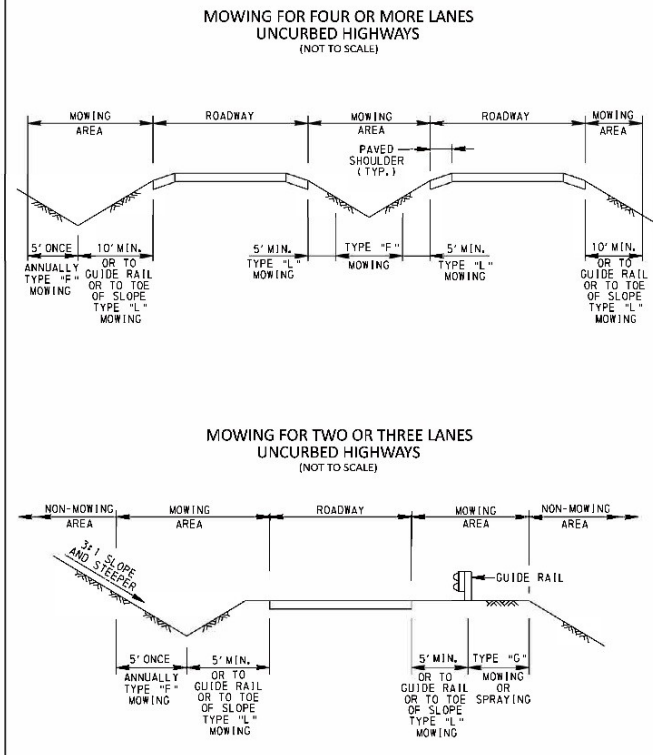
To Be Maintained Along Uncurbed Highways



Non-selective:	Target:	all vegetation (bareground)
	Focus areas:	guiderrails, signposts, concrete islands and barriers.
	Objective:	promote water flow off of the road surface.
Safety Clear Zone:	Target:	woody plants
	Focus areas:	dependent on size of right-of-way (ROW)
		1. large ROWs – 30 feet from edge of roadway
		2. small ROWs– on a 33 foot ROW, from the outer edge of the non-selective zone to the ROW boundary (only a few feet).
	Objective:	provide recovery zone for vehicles that have left the travel lane.
Selective Zone:	Target:	tall-growing tree species and noxious and invasive plants.
	Focus areas:	wider ROW, extends from the edge of the safety clear zone to a distance of up to 80 feet from roadway.
	Objective:	remove trees and problem weeds through occasional mowing (once every 2-3 years) and/or periodic herbicide applications.
Natural Zone:	Target:	noxious and invasive plants
	Focus areas:	wide ROW, extends outward from the edge of selective zone.
	Objective:	perform maintenance activities only if noxious or invasive weeds are present.



Figure 3 **STANDARD LIMITS OF MOWING**



Mowing Types

“L” Mowing is restricted to a single pass and the right side of the travel lane shall be cut to the minimum in Figure #2 or #3 where achievable or to guiderail or toe of slope. Widths greater than the minimum are allowable if accomplished within the single pass.

“F” Mowing is full-width with multiple passes and shall be done once annually after July 1st or every other year to eliminate woody plant establishment and maintain the 30-foot recovery zone or to the limits of the right of way. Consider extending type “F” mowing cycles to two years where achievable.

“G” Mowing is behind guiderail using a boom arm mower to the maximum of eight feet and shall be done once annually or every other year. Proper selective herbicide treatment may be performed in complement or in place of mowing.

Non-mowing areas are maintained with selective herbicide treatment.
 Guiderail areas are maintained with non-selective herbicide treatment.



4. Voluntary Conservation Actions

PennDOT proposes pollinator conservation efforts on rural road miles focused on three principal approaches that hold the greatest potential for increasing habitat for the monarch butterfly and pollinator habitat in general:

- i. Increased implementation of conservation mowing seasons and methods;
- ii. continued implementation of daylighting rural routes to promote milkweed and nectar producing plant growth; and
- iii. implementation of planted pollinator sites through PennDOT, PennDOT partners and Adopt and Beautify groups.

These approaches will be applied to the rural road network ROW. The rural road network represents 55% of the total state-maintained road miles. Approximately 25% of the rural road network ROW can be considered as having potential for pollinator habitat, or those ROW acres not within clear zones or being vegetated with woody species. These ROW acres are less likely to contain gasoline, motor oil and ethyl glycol residues or salt and sand from winter maintenance. In addition, research suggests that fewer pollinators cross roadways when pollinator habitat corridors occur adjacent to roadways. Research, accepted by conservation practitioners, supports the theory that habitat increases result in greater species population increases than vehicle conflict mortality, making these ROW acres a priority for pollinator habitat conservation⁷.

The three principal conservation approaches will be supported by increasing pollinator habitat implementation coordination through the use of experienced effective partners, updates to PennDOT publications, policies, guidance and training with pollinator habitat emphasis, use a GIS Pollinator Prioritization Model recently developed through NCHRP Research Project 20-119 by Monarch Joint Venture, OK State U. and the Xerces Society to assist in prioritizing the locations of pollinator habitat efforts for maximum benefit, improved documentation of conservation efforts, and implementation of rapid assessment and monitoring protocols. In addition, PennDOT through its research efforts, will continue to explore herbicide applications and seed mixes that promote native vegetation and minimize harm to pollinator species. These studies will inform the updates to PennDOT publications, policies and practices.

In the initial four years of monitoring, a rapid assessment monitoring protocol will be applied 2.5% of ROW pollinator sites to verify that the Thogmartin, et.al.⁸ milkweed stem density increases are accurate for Pennsylvania efforts. An emphasis will be placed on verification of the benefits of daylighting as a conservation measure as this best practice was not included in the Thogmartin, et. al. study. The initial year of monitoring efforts will be conducted on the 2016-2018 daylighting efforts.

In all years, monitoring will also occur on a sub-sample of planted habitat sites, however, beyond the initial four years of monitoring, efforts be limited to monitoring of planted pollinator habitat sites only with a focus on nectar plant diversity and verification of host plants availability for the site-specific target species. It is estimated that these monitoring efforts will result in 1% of pollinator conservation actions being monitored through field visits annually.

⁷Skorka, P.; Lenda, M.; Moron, D.; Kalarus, K.; Tryjanowski, P. 2013. Factors affecting road mortality and suitability of road verges for butterflies. *Biological Conservation* 159 (2013) 148-157.

Xerces Society for Invertebrate Conservation. 2010. *Pollinators and Roadsides: Managing Roadsides for Bees and Butterflies*. Invertebrate Conservation Guidelines.

⁸Wayne E Thogmartin *et al* 2017 *Environ. Res. Lett.* 12 074005



Reportable conservation efforts for the Monarch that occurred during the listing decision years of 2016-2018 and conceptual pollinator habitat conservation goals for future years are presented in Table 6. These have been developed based on current trends in PennDOT mowing and daylighting actions and an assessment of reasonable DOT pollinator habitat planting expectations. The conservation credits have been predicted and determined based on application of Thogmartin, et. al. baseline milkweed densities by land use and road corridor types and predicted stem densities for applied conservation BMPs. The USFWS Monarch Conservation Database incorporates these metrics⁹. It is expected that the proposed credits would be available to offset the effects of PennDOT actions to habitat for monarch butterfly. Additional verification of host and/or nectar plant availability would be required to achieve credits for yellow banded bumblebee, frosted elfin and regal fritillary. A net-benefit of 10% is proposed as set aside in accordance with the pre-listing policy.

Monarch Butterfly (*Danaus plexippus plexippus*):

a. Service Area

All of Pennsylvania is in the historic and current range of the monarch. The credit service area for this species will be statewide.

b. Voluntary Conservation Actions: Type, Location, Metrics, Performance Measures and Tracking

- i. Increased implementation of conservation mowing seasons and methods to be implemented on rural routes on the right sides of travel lanes beyond the safety clear zones.

Mowing type “F” as depicted in Figure 3 will be modified so that mowing occurs before May 1 or after October 1, or if mowing is required during the summer period it will be conducted from June 20 – July 10 to reduce mortality wherever possible as outlined in [FHWA-HEP-16-059, Roadside Best Management Practices that Benefit Pollinators](#). Mowing heights will be 8 – 12” to promote native plant establishment and reduce ground disturbance for other ground nesting pollinators. PennDOT, extracting data from its ePayroll¹⁰ reporting system will monitor and report milkweed stem-based credits and impacts associated with this conservation action annually with updates to the data presented in Table 6, Monarch Voluntary Conservation Action Credit Ledger. Reporting as an impact will occur if the date of mowing is other than during the conservation mowing periods.

- ii. Implementation of daylighting on rural routes with dense canopy cover to promote milkweed and nectar producing plant growth will continue to be planned and implemented by PennDOT Districts and Counties.

PennDOT, extracting data from its ePayroll reporting system will monitor and report milkweed stem-based credits and impacts associated with this conservation action annually with updates to the data presented in Table 6. Conservation efforts of this type will also be uploaded to the USFWS Monarch Conservation Database annually for tracking purposes.

- iii. Implementation of planted pollinator habitat sites through PennDOT, PennDOT partners and Adopt and Beautify groups will occur with the implementation of the following performance measures:

⁹ <https://www.fws.gov/savethemonarch/MCD.html>

¹⁰ As detailed in [Pub 113, Highway Foreman’s Manual](#)



1. Sites will be screened for suitability with the assistance of technical experts and GIS prioritization modeling.
2. A baseline host plant milkweed density and a nectar producing species richness (number of nectar producing species observed) will be documented.
3. The planted area will be measured and the implementation methods including site preparation, planting methods, seed mixes, and a site maintenance will be documented.
4. A sign or signs identifying the planted area as a pollinator habitat will be erected to advise the public of the pollinator effort.
5. Post effort monitoring will be performed utilizing a rapid assessment protocol that at a minimum provides a post effort milkweed stem density and nectar producing species richness. The presence of milkweed and at least two other nectar producing plant species will be identified for the site to be considered credit-worthy. Sites not achieving these measures will not be reported as credits in the annual program reporting.
6. The presence of invasive species, any site disturbances and the need for implementation of any post effort maintenance measures will be identified in the monitoring reporting.
7. If activities occur on any site that are inconsistent with maintaining the site in conservation pollinator habitat, the site credits will be removed from the credits reported as an update to Table 6 and documentation of the removal will be identified in the program level annual report. These activities would include conversions of the habitat to other land uses such as buildings or road improvements, or mowing occurring outside the conservation mowing method identified in (4)(b)(i).
8. Conservation efforts of this type will also be uploaded to the USFWS Monarch Conservation Database annually for tracking purposes.

c. Credit Ratio for Monarch

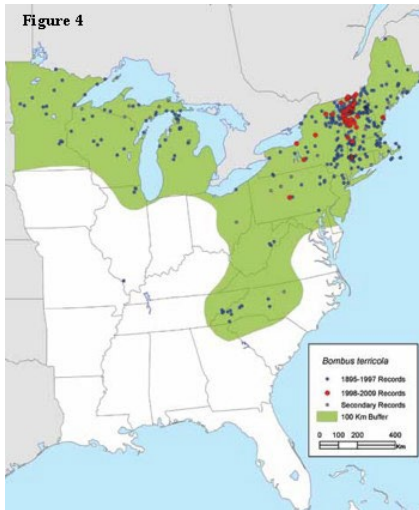
The USFWS has identified specific regions of the US as greater conservation priorities for the Monarch butterfly. Western Pennsylvania is in the highest conservation area identified. This highest priority area roughly corresponds with the North Core Conservation Unit identified in Figure 1¹¹. Counties adjacent to the North Core Conservation Unit and extending to the center of the state are identified as a high conservation priority with the priority waning as one moves further east. Based on these priorities, PennDOT proposes to apply the following ratios to credits yielded from conservation efforts beginning in 2019. A 1.5:1 ratio will be applied to credits in PennDOT Districts 1-0 (all counties), 2-0 (McKean, Elk, Cameron, Clinton, Potter, and Clearfield), 3-0 (Tioga, Lycoming and Sullivan), 9-0 (Cambria and Somerset), 10-0 (all counties), 11-0 (all counties) and 12-0 (all counties). Similarly, a 1.25:1 ratio will be applied to District 2-0 (Centre, Mifflin and Juniata), 3-0 (Union, Montour, Columbia, Snyder and Northumberland), and 9-0 (Blair, Bedford, Huntingdon and Fulton). Credits for all remaining PennDOT Districts and counties will be applied at a 1:1 ratio.

¹¹ <https://umn.maps.arcgis.com/apps/webappviewer/index.html?id=409aa8ddb48446a89c9ce2cb704a729d>



Yellow Banded Bumblebee (*Bombus terricola*):

a. Service Area



All of Pennsylvania is in the historic range of the yellow banded bumblebee and this species was common in the Commonwealth but has not been seen since 1999 except for limited locations in Centre, Clearfield, Clinton and Jefferson Counties. The credit service area for this species will be statewide.

b. Voluntary Conservation Actions: Type, Location, Metrics, Performance Measures and Tracking

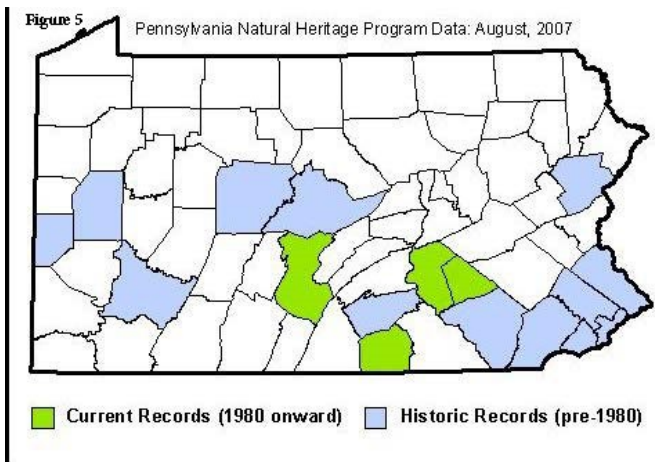
Implementation, metrics, performance measures will be performed as detailed for the Monarch with the following modification:

The nectar producing plants present post effort must include at least one of the following: blueberry (*Vaccinium*), willow (*Salix*); Rose (*Rosa*), blackberry and raspberry (*Rubus*); Honeysuckle (*Lonicera*); Goldenrod (*Solidago*); or asters.

A Voluntary Conservation Action Credit Ledger, specific to the yellow-banded bumblebee will be developed and included in the program level annual reports for the purposes of tracking credits and impacts. No credit ratios are proposed for this species.

Regal Fritillary (*Speyeria idalia*)

a. Service Area



The regal fritillary occurred historically in sixteen counties, but recent occurrences are limited to sites in Huntingdon, Adams, Dauphin & Lebanon counties. The credit service area will be limited to the counties with historic occurrences: Adams; Beaver; Bucks; Butler; Centre; Chester; Clearfield; Cumberland; Dauphin; Delaware; Huntingdon; Lancaster; Lebanon; Monroe; Montgomery; Philadelphia; Westmoreland; and any other county where found through new survey data.

b. Voluntary Conservation Actions: Type, Location, Metrics, Performance Measures and Tracking

Implementation, metrics, performance measures will be performed as detailed for the Monarch with the following modification:

The milkweed density estimates for baseline and post-effort will be replaced with density data for the required regal fritillary violet food plants and estimates of aerial coverage of native warm season bunch grasses. The presence of the required violets, a minimum of 30% aerial cover of native warm season

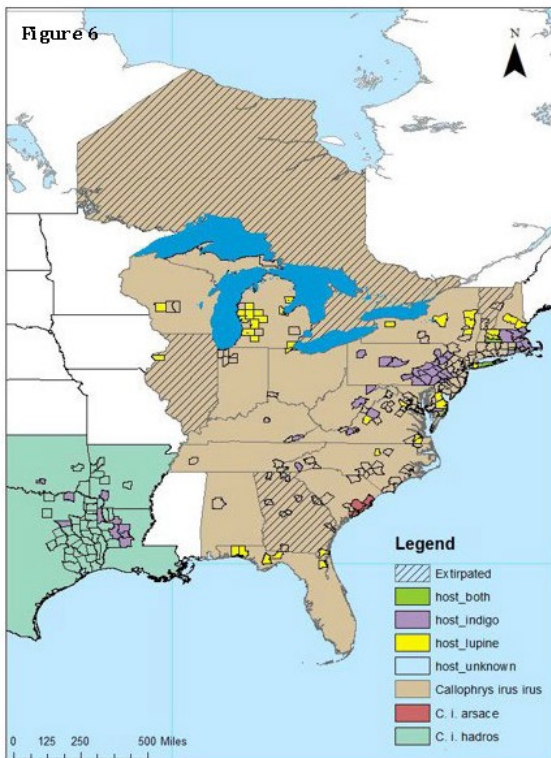


bunch grasses and at least two other nectar producing plant species of which at least one species must be common milkweed (*Asclepias syriaca*); orange/butterfly milkweed (*A. tuberosa*); pasture thistle (*Cirsium pumilum*); or field thistle (*C. discolor*) will be identified for the site to be considered credit-worthy. Sites not achieving these measures will not be reported as credits in the annual program reporting.

A Voluntary Conservation Action Credit Ledger, specific to the regal fritillary will be developed and included in the program level annual reports for the purposes of tracking credits and impacts. No credit ratios are proposed for this species.

Frosted Elfin Butterfly (*Callophyrus irus*)

a. Service Area



All of Pennsylvania is in the historic range of the frosted elfin and the service area will be Commonwealth-wide. Records identify this species currently or historically within the following counties: Berks; Bucks; Carbon; Centre; Chester; Clearfield; Cumberland; Dauphin; Delaware; Lackawanna; Lancaster; Lebanon; Lehigh; Monroe; Montgomery; Pike; Schuylkill; Venango; York; and any other county where found through new survey data.

b. Voluntary Conservation Actions: Type, Location, Metrics, Performance Measures and Tracking

Implementation, metrics, performance measures will be performed as detailed for the Monarch with the following modification:

The milkweed density estimates for baseline and post-effort will be replaced with density data for the required frosted elfin required host plants, wild indigo and lupine plants. The presence of one of these host plants and at least two other nectar producing plant species will be identified for the site to be considered credit-worthy. Sites not achieving these measures will not be reported as credits in the annual

program reporting.

A Voluntary Conservation Action Credit Ledger, specific to the frosted elfin will be developed and included in the program level annual reports for the purposes of tracking credits and impacts. No credit ratios are proposed for this species.

5. Potential Take

The effects associated with implementation of the conservation actions are anticipated to be insignificant. No effect is associated with the implementation of reduced and conservation mowing. Sites planted in pollinator habitat will be evaluated during planting design and selected sites will be those with lower numbers of milkweed stems pre-implementation resulting in discountable or insignificant effects. Linear forested areas daylighted currently have minimal milkweed and pollinator habitat development because of shading also resulting discountable effects.



6. Administrative Standards and Pollinator Credit Approval Process

PennDOT, through its District offices, partners and adopt and beautify groups, will pursue the implementation of the voluntary conservation actions. The program will be administered by PennDOT by the Chief, Environmental Policy & Development Section, Bureau of Project Delivery.

The Administrator will ensure that: the monitoring, credit verification and evaluation of effectiveness of voluntary conservation actions is completed; track debits and credits; and report results annually. Additionally, in consultation with the USFWS and the PennDOT Pollinator Work Group, the Administrator will pursue actions to incorporate pollinator conservation measures in PennDOT policies; and pursue adaptive management revisions where necessary to the metrics, performance standards, monitoring and credit approval processes identified in this program.

With execution of this program, the USFWS provides concurrence in the reported accrued available credits and set aside identified in Table 6, Monarch Voluntary Conservation Action Credit Ledger. Credits are available upon USFWS execution of this program.

USFWS will accept and evaluate annual reports submitted by the Administrator and provide written correspondence annually concurring with updates of the Voluntary Conservation Action Credit Ledgers. Credit updates are effective upon receipt of USFWS annual concurrence in the Voluntary Conservation Action Credit Ledgers.

7. Adaptive Management

PennDOTs pollinator conservation efforts are continuously evolving as the state of science, innovative technologies, protocols and policies develop. The proposed conservation efforts will be modified in an adaptive management manner as monitoring results identify the need for adjustment, new opportunities present. In consultation with the USFWS and the PennDOT Pollinator Work Group, the Administrator will make revisions where necessary to the metrics, performance standards, monitoring and credit approval processes identified in this program.



Table 6: Monarch Voluntary Conservation Action Credit Ledger: Conservation Actions and Predicted Credits

Conservation Action	Reportable Pre-Listing Period						Goals									
	2016		2017		2018		2019		2020		2021		2022		2023	
	acres	credits ¹	acres	credits ¹	acres	credits ¹	acres	credits ¹	acres	credits ¹	acres	credits ¹	acres	credits ¹	acres	credits ¹
reduced mowing or increased conservation mowing ²	9,940	568,051	-386	-22,074	15,095	862,658	4,108	381,428	4,108	381,428	4,108	381,428	4,108	381,428	4,108	381,428
daylighting	665	64,237	1,840	186,412	988	94,047	1,000	42,850	1,000	42,850	1,000	42,850	1,000	42,850	1,000	42,850
planted sites	0	0	0	0	0	0	22	943	55	2,357	110	4,714	110	4,714	110	4,714
annual beneficial acres	10,605		1,454		16,083		5,130		5,163		5,218		5,218		5,218	
Credits gained for year		632,288		164,338		956,705		425,221		426,635		428,991		428,991		428,991
10% Net Benefit Set Aside		63,229		16,434		95,671		42,522		42,663		42,899		42,899		42,899
Annual Credits - Set Aside		569,059		147,904		861,034		382,699		383,972		386,092		386,092		386,092
Annual Effects ³		371,250		371,250		371,250		371,250		371,250		371,250		371,250		371,250
CREDITS AFTER OFFSETTING ANNUAL EFFECTS ⁴		197,809		-223,346		489,784		11,449		12,722		14,842		14,842		14,842
ACRUED CREDITS		197,809		-25,537		464,247		475,696		488,418		503,260		518,102		532,944
ACRUED SET ASIDE		63,229		79,663		175,333		217,855		260,519		303,418		346,317		389,216
Monitoring requirement for credit approval ⁵							87		129		130		130		52	

¹ credits = # milkweed stems above baseline or prior condition

² 2019 - 2023 goals are a constant that is half the average of reduced & conservation mowing achieved in 2016-2018

³ avg 2019-2022 TIP effect of 23,250 + annual mowing effect of 348,000 used as a constant

⁴ monarch and yellow banded bumble bee credits; frosted elfin and regal fritillary credits due to host plant availability are not considered

⁵ monitoring requirements for 2019 are based on 2016-2018 daylighting; monitoring of planted acres occurs in the year following establishment.