

Appendix A: Insects

Monarch

Danaus plexippus

Federal Listing	N/A
State Listing	petitioned
Global Rank	
State Rank	S5
Regional Status	



Photo by Robert Crow Dreamstime.com

Justification (Reason for Concern in NH)

Monarchs across their range have exhibited precipitous declines, from about a billion adults in 1996 to 56.5 million on their wintering grounds in 2015, a decline of about 94% (USFWS 2015a and Jepsen et al 2015). Habitat declines in both the US and Mexico have contributed to this. In Mexico, illegal logging has removed trees that the monarchs use for overwintering. In the US, increased herbicide use has reduced both foraging and milkweed habitat, and pesticide use causes direct mortality. In addition, drought and extreme weather has reduced foraging opportunities for both southbound and northbound butterflies. In August, 2014 the USFWS was petitioned to list the Monarch as threatened in the US. In December the USFWS found that there was enough evidence to warrant further review (Federal Register Dec 31, 2014 p79775). In February 2015 the USFWS partnered with other agencies and NGOs to form the Monarch Joint Venture (<http://monarchjointventure.org/>), collaborating on habitat enhancements and reduced use of chemicals as well as engaging citizens in habitat management and citizen science projects (USFWS <http://www.fws.gov/news/ShowNews.cfm?ID=6F9989BD-0738-14CE-50EAC980BE1A75FC>).

Distribution

Monarchs in NH represent just a small percentage of the population. Habitat for this species is found along the edges of agricultural fields; however farming has declined over the last 100 years. Backyard pollinator gardens have been encouraged recently, and citizens are involved in some of the national citizen science projects such as Monarch Watch

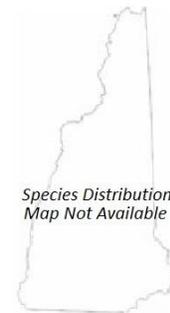
Habitat

Monarchs use a variety of habitats from meadows to edges of agricultural fields to gardens and anywhere else flowers are blooming that provide nectar sources for adults. Milkweeds are required for breeding, with eggs being laid on the underside of common milkweed and the caterpillars feeding exclusively on their leaves. Monarchs also pupate on milkweed plants. The third summer generation migrates southward, feeding on nectar throughout their journey to Mexico, where they overwinter on trees on one small section of mountainside forest. In 2015 all the monarchs from east of the Rockies ended up in a single, 3 acre patch of forest.

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NH Wildlife Action Plan Habitats

- Grasslands
- Developed Habitats



Distribution Map

Current Species and Habitat Condition in New Hampshire

There is little data on monarch populations in NH.

Population Management Status

Monarch populations are not managed in NH.

Regulatory Protection (for explanations, see Appendix I)

- NHFG Permit for collection or possession
- Federal Endangered Species Act - under consideration
- NHFG Rule FIS 803.02. Importation.
- NHFG Rule FIS 804.02. Possession.

Quality of Habitat

Agriculture has declined in NH, but interest in pollinator gardens and monarch butterfly habitat has increased. There is no quantitative data on habitat quality in NH.

Habitat Protection Status

A few farms have conservation easements on them that allow normal farming practices. It is unknown if the owners are practicing pollinator or monarch friendly practices.

Habitat Management Status

Outreach efforts to encourage homeowners and farmers to create and maintain pollinator habitat are done by NRCS and UNH Cooperative extension as well as NGOs.

Threats to this Species or Habitat in NH

Threat rankings were calculated by groups of taxonomic or habitat experts using a multistep process (details in Chapter 4). Each threat was ranked for these factors: Spatial Extent, Severity, Immediacy, Certainty, and Reversibility (ability to address the threat). These combined scores produced one overall threat score. Only threats that received a "medium" or "high" score have accompanying text in this profile. Threats that have a low spatial extent, are unlikely to occur in the next ten years, or there is uncertainty in the data will be ranked lower due to these factors.

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Mortality from the use of neonicotinoid and other pesticides (Threat Rank: High)

Neonicotinoids are broad spectrum insecticides that are applied both to foliage and to seeds which absorb them into the growing plant. The insecticide accumulates in nectar, which monarchs consume. Monarchs also may be exposed to direct spray or to residues on plant surfaces (CBC et al 2014). Use of neonicotinoids has expanded, with many crops and nursery plants receiving treatment. Nursery plants generally are not labelled as treated, and thus end up in gardens even when the gardener is trying to attract pollinators. Other pesticides also cause direct mortality or loss of fitness.

Habitat conversion from the loss of milkweed due to use of Roundup Ready corn and soy crops and subsequent herbiciding (Threat Rank: Medium)

Milkweeds and other wildflowers grow as weeds in crop fields. The use of roundup-ready crops allows farmers to spray herbicides to control weeds more effectively than other weed control methods resulting in a loss of milkweed (Jepsen et al 2015).

Habitat degradation from the loss of nectaring plants from herbicide drift (Threat Rank: Medium)

Herbicides that are sprayed can drift outside the treatment area, impacting milkweed and wildflowers at the edge of crop fields and beyond (CBC et al 2014)

Habitat conversion from development (Threat Rank: Medium)

Agricultural properties, including pastures and croplands, are easy to develop because they are level and lack trees. Removal of wildflowers that grow at the edge of or interspersed in agricultural lands removes critical habitat for monarchs. Monarchs are often killed as they cross roads.

Habitat degradation and mortality from invasive plants that act as dead-end host plants (Threat Rank: Medium)

Black swallow-wort (*Vincetoxicum nigrum*) and Pale swallow-wort (*V. rossicum*) are non-native milkweed-like plants which monarchs are attracted to for egg laying. The larvae die within a few days of hatching (Casagrande and Dacey 2007). In natural setting where the monarchs could choose between true milkweeds and these swallow-worts, 10-21% of eggs were laid on swallow-worts.

List of Lower Ranking Threats:

Habitat degradation and impacts from changes in precipitation and temperature that affect milkweed and nectar plant growth and larval growth

Mortality from predation and parasitism of eggs and larvae

Species impacts and mortality from increased diseases that affect sex ratio

Species impacts from disease and genetic alteration due to commercial capture, rearing and release elsewhere of adult monarchs

Habitat degradation from the loss of milkweed and nectaring plants due to aggressive roadside vegetation management

Actions to benefit this Species or Habitat in NH

Promote organic practices and integrated pest management (IPM) and discourage use of neonicotinoids

Primary Threat Addressed: Mortality from the use of neonicotinoid and other pesticides

Specific Threat (IUCN Threat Levels): Pollution / Agricultural & forestry effluents / Herbicides & pesticides

Objective:

Provide technical assistance to organizations that provide education, technical assistance and funding to farmers and homeowners on organic growing practices and IPM.

General Strategy:

Work with the NH Department of Agriculture, Northeast Organic Farmers Association, UNH Cooperative Extension, NRCS, nursery stock growers, garden centers, garden clubs, landscapers and others to educate farmers, homeowners and commercial landscapers on using IPM and organic practices.

Political Location:

Watershed Location:

Monitor monarchs

Objective:

Encourage participation in citizen science based national monarch monitoring programs

General Strategy:

Encourage UNHCE and nature center to promote Monarch Watch and other national monitoring programs.

Political Location:

Watershed Location:

Promote practices that enhance monarch and other pollinator habitat.

Primary Threat Addressed: Habitat conversion from the loss of milkweed due to use of Roundup Ready corn and soy crops and subsequent herbiciding

Specific Threat (IUCN Threat Levels): Agriculture & aquaculture

Objective:

Provide technical assistance to organizations that provide education, technical assistance and funding to farmers on practices that enhance habitat for pollinators.

General Strategy:

Encourage NRCS to fund practices that enhance habitat for pollinators. Work with the NH Department of Agriculture and UNH Cooperative Extension to promote farming practices that enhance pollinator habitat.

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Political Location:

Watershed Location:

Regulate release of monarch butterflies.

Primary Threat Addressed: Species impacts from disease and genetic alteration due to commercial capture, rearing and release elsewhere of adult monarchs

Specific Threat (IUCN Threat Levels): Biological resource use

Objective:

Require permitting through NHFG rules for releases.

General Strategy:

Require only wild caught NH monarchs to be used for release. Require permits and facility inspections to insure compliance.

Political Location:

Watershed Location:

Remove black and pale swallow-worts.

Primary Threat Addressed: Habitat degradation and mortality from invasive plants that act as dead-end host plants

Specific Threat (IUCN Threat Levels): Invasive & other problematic species, genes & diseases

Objective:

Identify locations where black and pale swallow-worts occur and remove them.

General Strategy:

Identify best methods for control of black and pale swallow-worts. Prioritize removal of these plants first at the leading edge of their spread, then elsewhere, targeting places where eradication is possible and then where control will remove plants particularly those large enough to attract monarchs.

Political Location:

Watershed Location:

References, Data Sources and Authors

Data Sources

Information on this species has been collected predominantly from the USFWS including the petition to list and from the review of monarch issues compiled by NatureServe and the Xerces Society for Invertebrate Conservation.

Data Quality

The available data on monarchs nationally is fairly well documented, Data from NH is lacking.

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2015 Authors:

Emily Preston, NHFG

2005 Authors:

Literature

Casagrande, R. A., & Dacey, J. E. 2007. Monarch butterfly oviposition on swallow-worts (*Vincetoxicum spp.*). *Environmental Entomology*, 36(3), 631-636.

Jepsen, S., D.F. Schweitzer, B. Young, N. Sears, M. Ormes, and S. H. Black. 2015. Conservation Status and Ecology of Monarchs in the United States. NatureServe, Arlington, Virginia and the Xerces Society for Invertebrate Conservation, Portland, Oregon. 36pp.

The Center for Biological Diversity (CBC), Center for Food Safety, Xerces Society for Invertebrate Conservation and Lincoln Brower. 2014. Petition To Protect The Monarch Butterfly (*Danaus Plexippus*) Under The Endangered Species Act. 159 pp.

[Http://www.regulations.gov/#!documentDetail;D=FWS-R3-ES-2014-0056-0221](http://www.regulations.gov/#!documentDetail;D=FWS-R3-ES-2014-0056-0221)