

Land Management in Eastern Massasauga Habitat

Wisconsin Department of Natural Resources

The eastern massasauga was listed as a Wisconsin state endangered species in 1975 by the Wisconsin Department of Natural Resources (WDNR) and was listed as a federally threatened species by the U.S. Fish and Wildlife Service (USFWS) in October 2016.

Prior to October 2016, the WDNR Grassland and Savanna Management Protocols for Eastern Massasaugas and Eastern Massasauga Species Guidance could be followed for all land management activities occurring within eastern massasauga habitat that had the potential to impact the species. However, beginning November 2016, **federal guidance must be followed** for all work occurring within eastern massasauga habitat that has the potential to impact the species.

For land managers whose activities have a federal component (e.g., all USFWS land managers, all WDNR land managers [there is an existing WDNR/USFWS agreement in place], individuals/organizations with federal funding, individuals/organizations with a federal agreement/contract), the USFWS has prepared a Land Management Biological Opinion that contains specific management guidance that must be followed. The link to the full Biological Opinion is listed below and we are working on compiling a summary version as well:

Biological Opinion:

https://www.fws.gov/midwest/endangered/section7/bo/2018_Rangewide_EMRLandManagementByUSFWS06282018.pdf

One of the most noteworthy portions of the Biological Opinion is the soil temperature guidance for prescribed burning prior to eastern massasauga **spring emergence**. Background information on the soil temperature guidance can be found on the following two pages.

During fall, burn dates should use a temperature-based determination (**soil temperature is below 50 F**) as previously noted in WDNR Grassland and Savanna Protocols – Eastern Massasauga (*Sistrurus catenatus*). This could be done with soil temperature probes (as recommended in the spring) or taken using a 15 cm soil thermometer probe.

Soil Temperature Probe Data (Eagle, Black River Falls, Ganoë Hills):

<https://mesowest.utah.edu/cgi-bin/droman/mesomap.cgi?state=WI&rawsflag=3>

In addition, final date cutoffs for burning in massasauga habitat, determined by WDNR staff and based on annual/local weather conditions, can be found here:

Amphibian/Reptile Activity Periods:

<https://dnr.wi.gov/topic/Wildlifehabitat/HerpRegulations.html>

Habitat Management - Prescribed Burning at Massasauga Sites

Eastern massasauga (EMR) are an early successional species requiring habitat management practices (i.e. mowing, prescribed fire) to maintain these conditions. Unfortunately, these activities can cause snake mortality if done improperly or poorly timed. Prescribed fire is routinely utilized in spring, when the longest period of suitable conditions exists, but can run into emergence times for the EMR.

Refined approach to predicting EMR emergence:

- Based on literature from Hileman (2016) and adopted by USFWS
- identifies an inversion (reversal) in soil temperature gradients to predict EMR egress
- Differences in daily mean soil temperature between 30 and 60 cm was most strongly associated with egress
- **End the burn season once the soil temperature at 30 cm has exceeded that at 60 cm *for 10 consecutive days***



Inversion occurred April 1 – April 10; meaning EMR egress started on April 10th, 2020 in southern Wisconsin

Habitat Management - Prescribed Burning at Massasauga Sites

Real-time temperature data will be available for property managers

- We will also maintain current Herp Activity Periods on NHC Herps page

WDNR RAWS Weather Stations with soil temperature probes (at depths of 10cm, 30cm, 60cm, and 1m)

- Waukesha
- Jackson
- Pepin

Existing USGS Weather Stations with soil temperature probes (5cm, 10cm, 20cm, 50cm, 1m)

- Juneau
- La Crosse

