

# Eastern Massasauga Rattlesnake Management Guidelines for Prairie Fen and Associated Oak Savanna Restoration in Michigan and Indiana

This document outlines a framework to promote the conservation and management of prairie fens and oak savannas to benefit numerous species of greatest conservation need, including the massasauga rattlesnake. Recommended conservation actions to manage prairie fen and savanna will include prescribed fire, mechanical treatments, water level manipulations, forest management and chemical treatments. The guidelines for each conservation action reflect the most up to date research and will be refined as additional information becomes available. The following guidelines will be followed by the Michigan DNR and our partners when we use competitive SWG funding to restore occupied massasauga habitat.

## Prescribed Fire

Fire is a natural process that occurs in many natural communities, including fens and other habitats occupied by massasauga. Fire in fens serves to keep the vegetation open, reduce shrub and tree cover, reduce surface cover and encourage germination and reproduction of many plant species. Prescribed fire will be allowed in occupied habitat even though it has the potential to kill individual snakes because of positive impacts to their habitat. For example, at some sites, prescribed fire may be the preferred or only effective management treatment for invasive species. In addition, prescribed fire may be the best method to discourage woody growth for the purpose of maintaining critical habitat. The following guidelines will allow managers to enhance or increase suitability of massasauga habitat while minimizing the potential loss of individual snakes.

1. Burning in occupied massasauga habitat when snakes are generally inactive or before emergence is unrestricted. The inactive period for massasaugas will be defined as November 1 through March 31 for Indiana and November 1 through April 15 for Michigan. Burning in managed massasauga habitat outside of that time period should follow the mitigations below.
2. Burns will be designed and conducted with the intent to minimize entrapping snakes between flame fronts. However, during a prescribed burn the burn boss may decide that perimeter ignition or a strip fire is necessary to protect human safety, structures or property.
3. A scientific fire behavior model, such as the United States burn model, the Canadian burn model or equivalent will be used to formulate a burn prescription for a maximum rate of spread no faster than 16 chains per hour (17.6 feet per minute) and an average rate of 10 chains per hour or less (11 feet per minute), except in known hibernacula areas.
4. Where hibernacula are known to be dense (greater than 5 hibernacula per acre), no burning is allowed from March 15 to May 15.
5. Fire breaks should be established during the inactive season or along existing fuel breaks (creeks, trails, roads). Disking and plowing burn breaks will be minimized unless human health and safety are jeopardized.

### Mechanical Treatments

Land managers routinely use mechanical treatments to enhance and establish wildlife habitat. For these guidelines, mechanical treatments have been divided into 2 major categories: 1) mowing and hydro-axing and 2) cultivation (tilling, plowing, and disking). The following precautions should be observed when mechanical treatments are used in occupied massasauga habitat.

#### Mowing and Hydro-axing

1. Turfgrass areas should be maintained at < 15 cm (6 inches) at all times.
2. In areas with known hibernacula, mowing and hydro-axing are highly discouraged any time of year.
3. It is highly recommended that land managers mow or hydro-axe during the inactive season.
4. If land managers are trying to improve massasauga habitat in highly degraded sites then mowing and hydro-axing may be permitted during the active season. For example, a land manager may want to control invasive species or convert agricultural fields to native grasslands.

#### Cultivation

Cultivation is strongly discouraged in occupied habitat regardless of snake activity. However, the following practices will be considered acceptable:

1. Areas that are to be treated with mechanical soil disturbance should be mowed during the inactive season to less than 15 cm (6 in) in height so that they are unattractive to snakes the following spring.
2. Areas can be continuously maintained as row cropped agriculture.
3. Cultivation can be used for the establishment of fire breaks as outlined in the prescribed fire guidelines.
4. Cultivation can be used when necessary to protect human or natural resource health and safety (e.g. wildfire response operations.)

### Water Level Manipulation

Maintaining the natural hydrology is critical for maintaining viable populations of amphibians and reptiles. In some wetland complexes, the natural fluctuations in water levels help maintain open landscapes. The groundwater or saturated soils protect hibernating snakes from freezing during winter. Draining removes the heat sink capabilities of water and weakens the thermal link to warmer areas farther underground. Therefore, alterations to wetland hydrology during winter may have negative impacts on amphibian and reptile populations. The following precautions should be observed when manipulating water levels in occupied habitat.

1. Water levels in managed habitat will not be drawn down during the inactive season except for human health and safety reasons.

2. Water levels may be raised for up to two continuous weeks during a single inactive season except for health and safety concerns.
3. Permanent flooding or drainage that results in loss of massasauga habitat is prohibited.
4. Water levels may be raised during the active season, including flooding as a result of beaver activity.
5. Temporary flooding to mimic the restorative effects of beaver activity for one to five years will need pre-approval.

### Forest Management

Most forestry activities that are conducted in accordance with sustainable forest management principles are not expected to negatively impact massasaugas. However, the following guidelines should be observed when forest management practices occur in occupied habitat.

1. Conduct timber harvesting operations when substrate is firm and dry in mid to late summer or when the ground is adequately frozen so that rutting and compaction is minimized.
2. Reforest stands through natural regeneration or tree planting. Planting densities should be at levels that assure a similar cover type pattern, or retain or mimic more open forest communities. For example, the restoration or creation of savannas and barrens are encouraged.
3. Consider increasing fine and coarse woody debris retention, creating brush piles and favoring other habitat elements.

### Chemical Control

Chemicals have been used by many natural resource professionals to achieve specific habitat management goals and objectives. Due to the unknown impacts of herbicides to massasaugas, it is recommended that land managers restrict broadcast applications in managed habitat. However, land managers may use broadcast spraying to re-establish suitable habitat at highly degraded sites. For example, a land manager may convert row crops to native grasslands or control monocultures of invasive species.