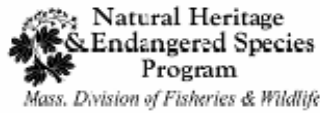


Cranberry Bog Best Management Practices in Eastern Box Turtle (*Terrapene carolina*) Habitat



Editors

**Natural Resources Conservation Service
University of Massachusetts Cranberry Station**



Background

The Eastern Box Turtle (*Terrapene carolina*) is a small terrestrial turtle (4.5''-6.6'' in length). It has a high domed oval shell with variable coloration and markings (dark brown, black, yellow, orange, and red). Further identification can be made by looking for their beak like upper jaw, short tail, carapace with a midline ridge (keel), and their ability to completely enclose their limbs in between their upper and lower shell. Eastern Box Turtle hatchlings can be identified by their brownish-grey carapace, a single yellow spot on each scute, and yellow plastron.

Eastern Box Turtles are active from early-April through October. During the spring and summer they often forage and mate in forest edges, fields and other early successional habitats. Some individuals will remain in the forest during these times of year. During late summer and early fall, Eastern Box Turtles tend to move back into forested areas, where they over-winter a few inches underground. Eastern box turtles are omnivores and reach sexual maturity around 13 years of age. They can live to 100 years, but on average live to be about 40-50 years old.

Conservation Status in Massachusetts

Eastern Box Turtles are found from southeastern Maine to northern Florida and west to Michigan, Illinois, and Tennessee. In Massachusetts they are near the northernmost limit of their range, and are most prevalent in Cape Cod, the southeast, and southern Connecticut River Valley, with a spotty distribution elsewhere. They are listed as a Species of Special Concern under the Massachusetts Endangered Species Act.

Under natural conditions, Eastern Box Turtles experience very high nest failure rates and high rates of juvenile mortality. As a result, adult Eastern Box Turtles must, on average, be very long-lived in order to successfully reproduce themselves and maintain a stable population size. In recent decades, southeastern Massachusetts and Cape Cod have

experienced rapid rates of development, making Eastern Box Turtles increasingly vulnerable to road-related mortality and habitat fragmentation. Threats to eastern box turtles in Massachusetts include habitat loss, fragmentation, and degradation; road traffic; unauthorized collection; mowing; burning; increased levels of predation in developed areas and off road vehicle disturbance.

Box Turtles and Cranberry Bogs

Turtle studies in Massachusetts have shown that Eastern Box Turtles have a special relationship with cranberry bogs. Eastern Box Turtles are attracted to bog edges, stockpiling areas, and sand pits to bask, feed, and nest, and sometimes congregate at bog edges in numbers. For example, one radio tracking study in Kingston showed large numbers of Eastern Box Turtles congregating within brushy areas near the bog edges during spring and summer, but box turtles rarely entered the bogs themselves. Cranberry bog ecosystems can clearly provide important habitat features for Box Turtles, but practices such as mowing can present some risk to turtles occupying productive bog areas. With a bit of planning, bog operators can minimize risks to Eastern Box Turtles, and maybe even enhance their habitat, without negatively impacting bog operations or productivity.

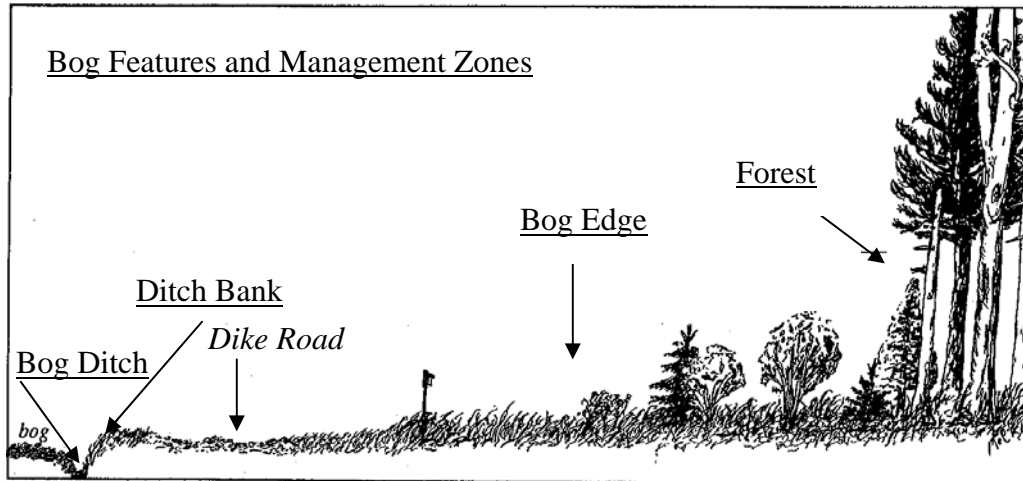
Recommended Management Practices and Plantings

The goals of these cranberry bog management practices are to:

- Maintain bog productivity and minimize costs;
- Minimize risk of inadvertent injury or mortality to Eastern Box Turtles resulting from mowing and or the operation of other heavy equipment;
- Maintain and or enhance Eastern Box Turtle habitat features within the bog ecosystem.

All recommendations have been reviewed by professionals in the fields of wildlife biology and agriculture. We would like growers to consider incorporating these management practices into their own maintenance regimes, and or to take other “common sense” precautions to minimize risks to Eastern Box Turtles associated with mowing and other vegetation management activities. The list of recommended plantings includes plant species that will be beneficial to wildlife and not negatively impact cranberry bogs. We encourage growers to reference this list when considering bog expansion/development, enhancement of bog features, and creation of wildlife habitat on their property.

Recommended Management Practices



Ditch Bank, Bog Ditches, Dike Road, and Areas inside of the Dike Road:

Recommended Mowing Procedures:

- 1) Mow only as needed for normal bog operation.
- 2) Mow at a lower gear and speed.
- 3) Mow direction: start at the edge closest to the bog and mow parallel to the dike.
- 4) Mow during the middle hours (11:30am-3:30pm) of the day.
- 5) Walk through the area prior to mowing in order to move any turtles out of the way. Place turtles in already mowed areas or in nearby areas unintended to be mowed on the property. Please note that it is illegal to relocate species off of your property.
- 6) Extra care and attention is warranted during May & June, when Eastern Box Turtles are most likely to be in these areas.

Bog Edge and Other Brushy, Grassy, and Staging Areas outside of the Dike Road:

Recommended: If possible, avoid mowing and brush hogging from May – September.

Fall and winter are excellent times to conduct such work.

If you must mow these areas during May –September:

- 1) Mow only as needed for normal bog operation.
- 2) Consider avoiding such activities during May-June, the period of highest risk to Box Turtles.
- 3) Mower blade height: raise blade 7 inches above the ground or higher.
- 4) Mow at a low gear and speed.
- 5) Mow direction: start at the edge closest to the dike and mow parallel to the forest.
- 6) Mow during the morning hours (7:30am-11:30am).
- 7) Walk through the area prior to mowing in order to move any turtles out of the way. Place turtles in already mowed areas or in areas unintended to be mowed; located immediately nearby by on the property.
- 8) When possible avoid flail mower heads with guide bars that ride along the ground
 - a. Alternatives
 - i. Raise the flail mower head >7 inches off the ground
 - ii. Use sickle-bar mowers for grasslands and fields

- iii. Use brontosaurus style brush mowers for woody vegetation (>1-2'' in diameter)

Herbicides: if using, spot treat herbaceous and woody plants (e.g. saplings) to maintain patches of shrubs, grasses, and open sandy soil suitable for Eastern Box Turtles.

Management of bog edge and zone transitioning to forest canopy

Create and maintain patchy shrubland/grassland with some areas of exposed soil; avoid excessive sapling densities (particularly White Pine). All mechanical management should be avoided from May-September.

- 1) Remove an over abundance of white pines and other dense woody material:
 - a. Encourage the (preferably patchy) growth of deciduous shrubby species in the bog edge.
 - b. Maintain patches with exposed sandy soil and or warm season bunch grasses
 - Preferred
 1. Selective removal of woody plants with hand tools and or spot treatment of herbicides.
 2. Brush hogging or mowing during fall and winter (October – April)

Sandpits:

Preferred timing for extraction:

- 1) It is best to extract sand from **October 15 - April 15**, which generally coincides with typical bog management practices.
- 2) Every effort should be made to avoid extraction during and just prior to the nesting season (**May 15 – July 15**).
- 3) If it is necessary to work during the turtle active season (April 15 – October 15), then gravel and loose sand should only be extracted from non-vegetated areas found in the center of the pit (**Prior to May 15 and After July 15**).

Brush and stump piles, loam piles; other debris:

Eastern Box Turtles are sometimes attracted to these features.

1. It is best to perform cleanups during the fall and winter, when turtles are inactive and in the forest.
2. If possible, leave some of these features within the bog edge zone, open areas, and edges of sandpits for wildlife habitat.

Refer to:

645 Upland Wildlife Habitat Management: Wildlife Brush Pile Job Sheet

Access:

Internet:

<http://www.in.nrcs.usda.gov/technical/biology/biology.html>

Forests and Woodlands:

Refer to:

Massachusetts Forestry Conservation Management Practices for Eastern Box Turtles

Access:

Internet:

http://www.mass.gov/dfwele/dfw/nhesp/regulatory_review/pdf/easternbox_turtle_cmp.pdf

Or by contacting:

Natural Heritage and Endangered Species Program, Division of Fisheries and Wildlife.
1 Rabbit Hill Rd, Westborough, MA 01581
Tel: (508) 389-6360; Fax: (508) 389-7891

General Recommendations:

- 1) Control ATV traffic:
 - a. Installation of gates/rocks to prevent ATV traffic on property.
 - i. Block all known ATV trails on property.

Site-specific Consultations with NHESP Turtle experts:

NHESP staff is available to provide technical assistance to growers interested in implementing these recommendations, or other measures to enhance wildlife habitat. We are also available to answer any questions that may arise.

Please contact Consulting Biologist David Paulson, at: (508) 389-6366 or david.paulson@state.ma.us

Recommended Plantings

Dike Road and Ditch Bank:

NRCS Approved Conservation Mix

- | | |
|--|---------------------|
| 1) Chewings Red Fescue (<i>Festuca rubra ssp. commutata</i>) | OR 15 lbs/ac |
| Creeping Red Fescue (<i>Festuca rubra var rubra</i>) | |
| 2) Hard Fescue (<i>Festuca trachyphylla</i>) | 15 lbs/ac |
| 3) Sheep Fescue (<i>Festuca ovina</i>) | 15 lbs/ac |
| 4) Perennial Rye Grass (<i>Lolium perenne</i>) | 10 lbs/ac |

Plus: (optional if legume desired and possible spreading into bog is not a concern)

White Clover (<i>Trifolium repens</i>)	4 lbs/ac
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Bog Edge and Other Brushy / Grassy Areas:

- 1) Sweet fern, (*Comptonia peregrina*)
- 2) Laurels, (*Kalmia* spp.)
- 3) Sumac, (*Rhus* spp.)
- 4) Oaks, (*Quercus* spp.)

- 5) Blackberry and Raspberry, (*Rubus* spp.)
- 6) Huckleberry, (*Gaylussacia baccata*)

Grant Programs

Grant programs are available that may assist in providing funds to support these recommendations

- 1) NRCS WHIP Program (<http://www.nrcs.usda.gov/Programs/whip/>)
- 2) NRCS EQIP Program (<http://www.nrcs.usda.gov/PROGRAMS/EQIP/>)
- 3) MassWildlife LIP Program
(http://www.mass.gov/dfwele/dfw/habitat/grants/lip/lip_home.htm)

Massachusetts NRCS Field Offices

<u>Field Office</u>	<u>Location</u>	<u>Phone</u>
Barnstable	270 Communications Way Unit 1G Hyannis, MA 02601	508-771-6476
Greenfield	55 Federal Street Hayburne Building, Room 290 Greenfield, MA 01301	413-772-0384 Ext. 3
Hadley	195 Russell Street Suite B6 Hadley, MA 01035	413-585-1000 Ext. 3
Holden	52 Boyden Road, Medical Arts Building: Room 100 Holden, MA 01520	508-829-4477 Ext. 3
Pittsfield	78 Central Street, Suite 206 Pittsfield, MA 01201	413-443-1776 Ext. 3
Westford	319 Littleton Road, Suite 205 Westford, MA 01886	978-692-1904 Ext. 3
West Wareham	15 Cranberry Highway West Wareham, MA 02576	508-295-5151 Ext. 2

University of Massachusetts Cranberry Station

1 State Bog Road E. Wareham, MA 02538
508-295-2212

MassWildlife LIP

1 Rabbit Hill Road Westborough, MA 01581
508-389-6387

Turtle Information and Conservation Tips

Access:

Internet:

http://www.mass.gov/dfwele/dfw/nhesp/conservation/herps/turtle_tips.htm

Or by contacting:

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