

## Appendix A

**Species Listing PROPOSAL Form:****Listing Endangered, Threatened, and Special Concern Species in Massachusetts**Scientific name: *Sturnella magna*Current Listed Status (if any): noneCommon name: Eastern Meadowlark**Proposed Action:**

  X   Add the species, with the status of: Threatened      Change the scientific name to: \_\_\_\_\_  
 \_\_\_\_\_ Remove the species      Change the common name to: \_\_\_\_\_  
 \_\_\_\_\_ Change the species' status to: \_\_\_\_\_      (Please justify proposed name change.)

**Proponent's Name and Address:**

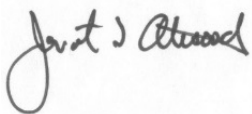
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Association, Institution or Business represented by proponent: Mass Audubon

Proponent's Signature:



Date Submitted: 10 March 2018

**Please submit to:** Natural Heritage & Endangered Species Program, Massachusetts Division of Fisheries & Wildlife, 1 Rabbit Hill Road, Westborough, MA 01581

## **Justification**

Justify the proposed change in legal status of the species by addressing each of the criteria below, as listed in the Massachusetts Endangered Species Act (MGL c. 131A) and its implementing regulations (321 CMR 10.00), and provide literature citations or other documentation wherever possible. Expand onto additional pages as needed but make sure you address all of the questions below. The burden of proof is on the proponent for a listing, delisting, or status change.

- (1) **Taxonomic status.** Is the species a valid taxonomic entity? *Yes.*

Please cite scientific literature.

*See summary of Systematics in:*

*L. A. Jaster, W. E. Jensen and W. E. Lanyon. 2012. Eastern Meadowlark (Sturnella magna), The Birds of North America (P. G. Rodewald, Ed.). Ithaca: Cornell Lab of Ornithology; Retrieved from the Birds of North America: <https://birdsna.org/Species-Account/bna/species/easmea>. DOI: 10.2173/bna.160.*

- (2) **Recentness of records.** How recently has the species been conclusively documented within Massachusetts? *2017.*

- (3) **Native species status.** Is the species indigenous to Massachusetts? *Yes.*

- (4) **Habitat in Massachusetts.** Is a population of the species supported by habitat within the state of Massachusetts? *Yes.*

- (5) **Federal Endangered Species Act status.** Is the species listed under the federal Endangered Species Act? *No.*

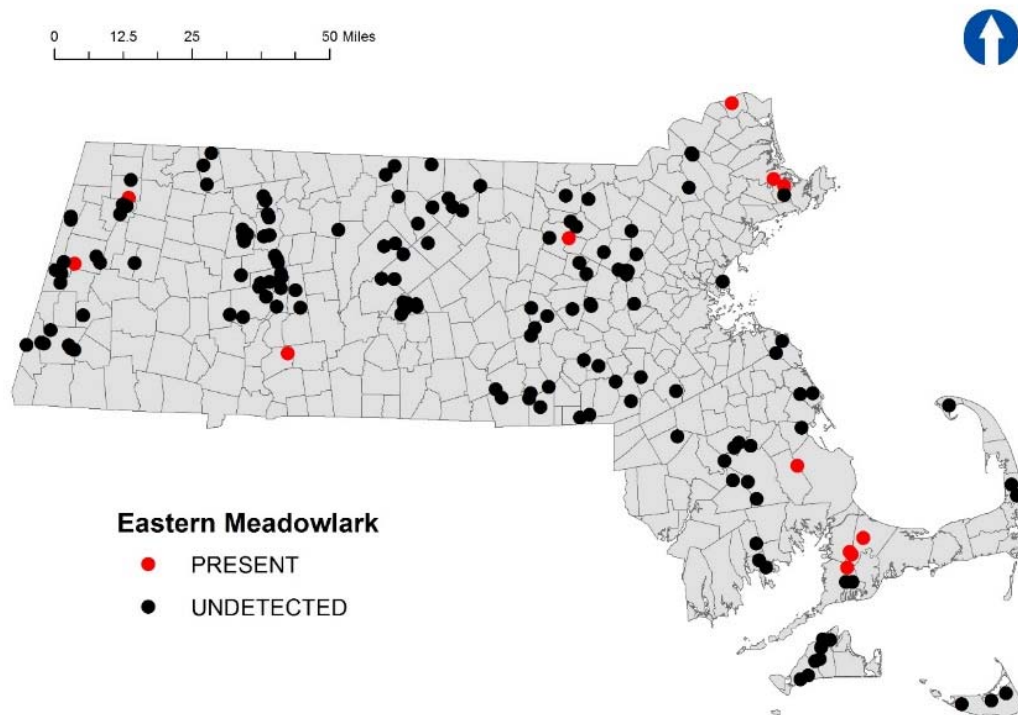
If so, what is its federal status (Endangered or Threatened)?

**(6) Rarity and geographic distribution.**

- (a) Does the species have a small number of occurrences (populations) and/or small size of populations in the state? Are there potentially undocumented occurrences in the state, and if so, is it possible to estimate the potential number of undocumented occurrences?

*In 2017 Mass Audubon coordinated a pilot study of Eastern Meadowlark distribution in Massachusetts. 51 birders participated in the effort, covering 161 sites in a total of 88 towns that had been identified from Google Earth imagery as potential habitat for Eastern Meadowlarks. These sites were random in selection, and not intended to represent all potential habitat within the state. Participants were for the most part experienced birders, and their observations of the 3 target species (Eastern Meadowlark, Grasshopper Sparrow, and Bobolink) are considered credible. However, because surveys were designed to facilitate easy participation by volunteers, the 3 target bird species may occasionally have been present at a site but gone undetected.*

*Eastern Meadowlarks were seen at 12 of 161 sites (7%). In comparison, Grasshopper Sparrows were seen at 17 of 161 sites (11%), and Bobolinks were seen at 65 of 161 sites (40%). Some sites proved to be inappropriate for any grassland bird species, but the fact that Eastern Meadowlarks were observed less frequently than either Grasshopper Sparrow or Bobolink reflects the species' rarity as a breeding bird within the state of Massachusetts. Meadowlarks are an easily identifiable species and, if present, are not easily missed during the breeding season.*



*Results of 2017 pilot study of Eastern Meadowlark distribution in Massachusetts.*

*Of the 76 sites where at least one of these grassland birds was recorded, at only 3 locations were all 3 species observed. Grasshopper Sparrows and Bobolinks were absent from 5 of the 12 sites where*

*meadowlarks were recorded. Of the 12 sites where Eastern Meadowlarks were seen, Grasshopper Sparrows were seen at 5 (42%), and Bobolinks at 5 (42%). Of the 17 sites where Grasshopper Sparrows were seen, Eastern Meadowlarks were seen at 5 (29%), and Bobolinks at 13 (76%). Of the 65 sites where Bobolinks were seen, Grasshopper Sparrows were seen at 13 (20%), and meadowlarks at 5 (8%). These results suggest that Eastern Meadowlarks are not being effectively protected by conservation measures being taken to conserve either Grasshopper Sparrows or Bobolinks.*

*Mass Audubon's 2017 pilot project did not attempt to estimate actual number of breeding pairs, since many sites were located on private property where access permission had not been granted. However, at the 12 sites where Eastern Meadowlarks were reported, none included more than 3 pairs, and most only reported a single pair. Four of the 12 sites (33%) were located on grassy areas adjacent to airport runways.*

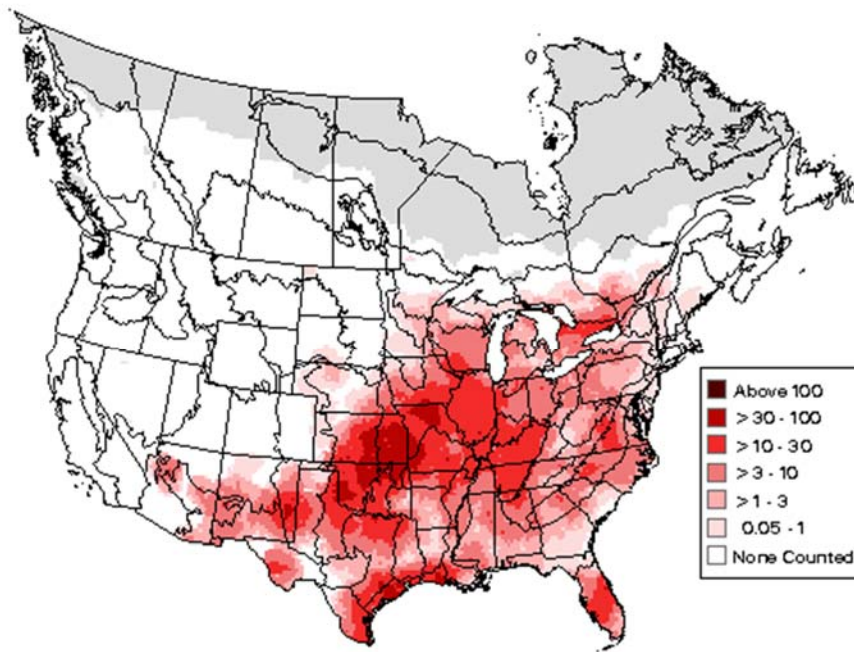
*Ongoing work planned by Mass Audubon in 2018 will expand on this survey effort.*

(7) **Is the species a state or regional endemic?**

*Eastern Meadowlark is not a state or regional endemic.*

What is the extent of the species' entire geographic range, and where within this range are Massachusetts populations (center or edge of range, or peripherally isolated)?

*Eastern Meadowlarks breed throughout most of eastern North America. Centers of population abundance are located in the Midwest, especially including Texas, Oklahoma, Kansas, and Missouri. Densities in the northeast (including Massachusetts) are relatively low (0.05 – 1 individual per Breeding Bird Survey route).*

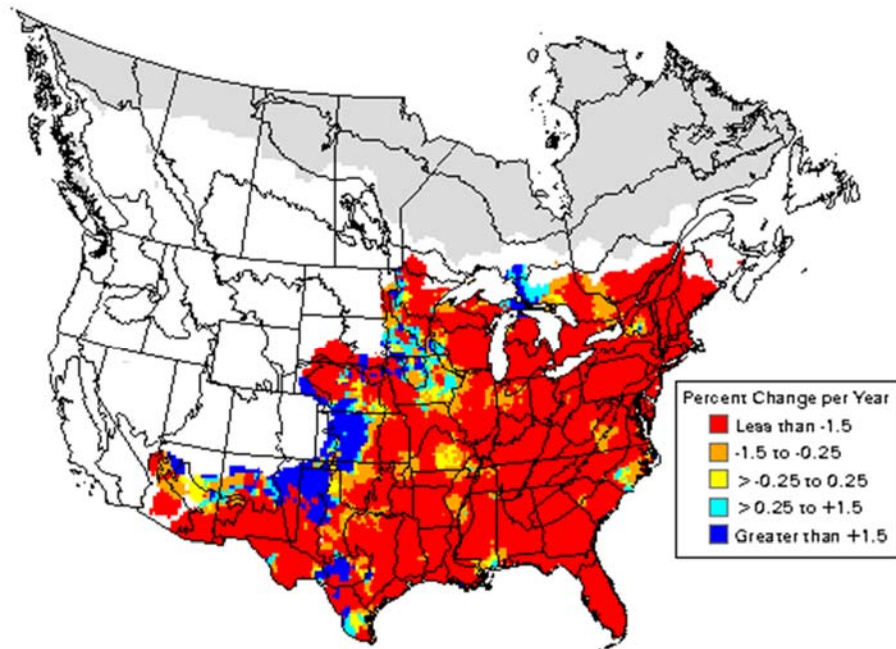


North American Breeding Bird Survey (1966-2015), estimates of breeding density. [https://www.mbr-pwrc.usgs.gov/bbs/ra2015/ra2015\\_red\\_v3.html](https://www.mbr-pwrc.usgs.gov/bbs/ra2015/ra2015_red_v3.html)

(8) **Trends.**

- (a) Is the species decreasing (or increasing) in state distribution, number of occurrences, and/or population size? What is the reproductive status of populations? Is reproductive capacity naturally low? Has any long term trend in these factors been documented?

*Eastern Meadowlark is showing serious population declines ( $< -1.5$  percent change per year) throughout most of its North American breeding range, including the state of Massachusetts.*



North American Breeding Bird Survey (1966-2015, trend results. [https://www.mbr-pwrc.usgs.gov/bbs/tr2015/trend2015\\_v3.html](https://www.mbr-pwrc.usgs.gov/bbs/tr2015/trend2015_v3.html))

Within Massachusetts, USGS Breeding Bird Survey data indicate a trend estimate (percent change per year) of -9.72 (credible interval = -8.10 – -11.10) during the 49 year period 1967-2015 (<https://www.mbr-pwrc.usgs.gov/bbs/trend/tf15.html>).

During the 10 year period from 2005-2015, the estimated percent change per year was similar to that calculated over the longer time period (-9.66, credible interval = -4.88 – -13.15).

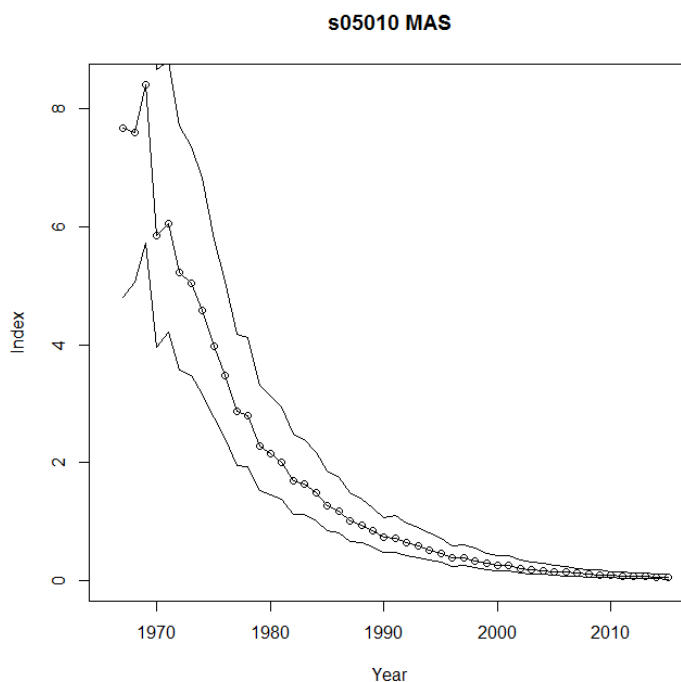
Regional Credibility Measure	Sample Size Indicator	Precision Indicator	Relative Abundance Indicator	AOU Number	Region Code	Species Name	Region	Sample Size	1966-2015 Trend Estimates	1966-2015 Credible Interval for Trend	2005- 2015 Trend	2005-2015 Credible Interval for Trend	Relative Abundance
G	G	G	G	5010	MAS	Eastern Meadowlark	Massachusetts	24	-9.72	(-11.10, -8.10)	-9.66	(-13.15, -4.88)	1.01
G	G	G	G	5010	EAS	Eastern Meadowlark	Eastern BBS Region	1815	-3.83	(-3.98, -3.69)	-4.02	(-4.47, -3.59)	15.72
G	G	G	G	5010	SUR	Eastern Meadowlark	Survey-wide	2526	-3.28	(-3.60, -3.03)	-3.05	(-3.56, -2.29)	24.2

North American Breeding Bird Survey (1966-2015, trend results).

[https://www.mbrpwrc.usgs.gov/bbs/BBS Trend Estimates 2015 7-29-2016.csv](https://www.mbrpwrc.usgs.gov/bbs/BBS_Trend_Estimates_2015_7-29-2016.csv)

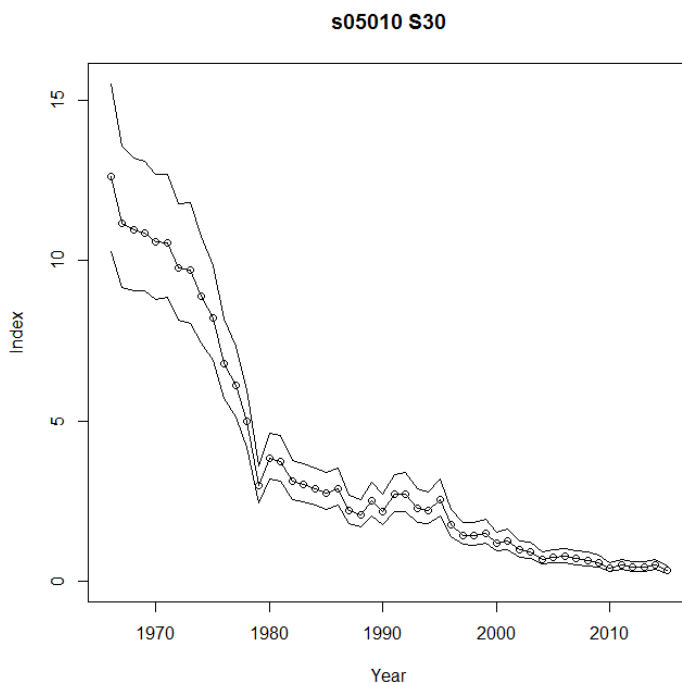
[Note: a “credible interval” means that “given our observed data, there is a 95% probability that the true value ... falls within the credible region” (<http://freakonometrics.hypotheses.org/18117>)].

Presented in graphical form, the Breeding Bird Survey data indicate strong declines in Eastern Meadowlark numbers at the statewide, regional and continental scales.



Population trend of Eastern Meadowlark in Massachusetts, based on USGS Breeding Bird Survey (1966-2015).

<https://www.mbr-pwrc.usgs.gov/bbs/graphs15/s05010MAS.png>



*Population trend of Eastern Meadowlark in New England-Mid-Atlantic Coast, based on USGS Breeding Bird Survey (1966-2015).*

<https://www.mbr-pwrc.usgs.gov/bbs/graphs15/s05010S30.png>

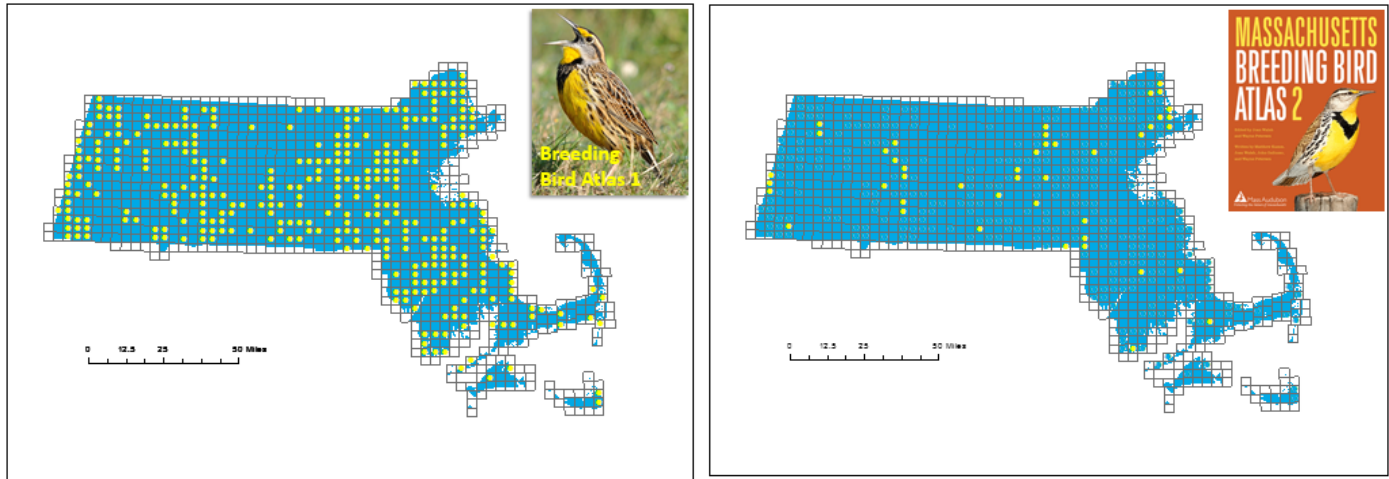


*Population trend of Eastern Meadowlark in North America, based on USGS Breeding Bird Survey (1966-2015).*

<https://www.mbr-pwrc.usgs.gov/bbs/graphs15/s05010SUR.png>



These results are also reflected by Mass Audubon's Breeding Bird Atlas data, collected during 1974-1979 (Atlas 1) and 2007-2011 (Atlas 2). Restricting observations to those Atlas blocks where evidence of breeding Eastern Meadowlarks was "confirmed" (<https://www.massaudubon.org/content/download/8933/152595/file/handbook.pdf>, p.12) showed that of 348 sites where breeding Eastern Meadowlarks were confirmed in 1974-1979, 87% were no longer occupied during 2007-2011 (Breeding Bird Atlas 2).



Comparison of confirmed Eastern Meadowlark breeding records between Mass Audubon's first (1974-1979) and second (2007-2011) Breeding Bird Atlases.

*There is no information available regarding reproductive status of populations or reproductive capacity.*

**(9) Threats and vulnerability.**

- (a) What factors are driving a decreasing trend, or threatening reproductive status in the state? Please identify and describe any of the following threats, if present: habitat loss or degradation; predators, parasites, or competitors; species-targeted taking of individual organisms or disruption of breeding activity.

*Eastern Meadowlarks typically require fairly large expanses of grassland that, in New England, are usually maintained by focused management or agricultural practices. Compounding the problem of habitat loss associated with suburban development, the timing of agricultural activities can frequently result in direct loss of active meadowlark nests. Across its range, agricultural intensification (hay cuts that are both earlier and more frequent) is considered the primary threat to Eastern Meadowlark populations (Jaster et al. 2012; Walk et al. 2010).*

*Following from Jaster et al. (2012, Conservation and Management). Although the majority of these studies have been conducted in mid-western states characterized by grasslands different from those found in New England, the following conclusions are likely to be largely true for Massachusetts. Specific study of conservation and management needs within Massachusetts is needed.*

## “Conservation and Management

### Effects of Human Activity

Biologists conducting field studies should be aware that meadowlarks are extremely sensitive to the presence of humans in their breeding territory. A female flushed from her nest during incubation invariably aborts. Disturbance near nests with young is less likely to cause desertion, but adults become wary, secretive, and will delay visits to nest.

Agricultural practices directly affect breeding populations through degradation of suitable habitat, grazing and trampling by livestock, and mortality from early mowing and use of pesticides and other contaminants. Intensive agriculture is likely a major contributor to population declines (Jobin et al. 1996, With et al. 2008). Surface tillage for spring weed-control destroys all nests and flightless young and kills or injures many incubating adults; undercutting wheat stubble in spring saves nests and lives (Rodgers 1983b). Abandonment of farms and succession from fields to woodland means less suitable nesting habitat. Grasslands established through the Conservation Reserve Program (CRP, United States Department of Agriculture) have likely benefitted Eastern Meadowlarks (McCoy et al. 1999, Riffell et al. 2008).

### Management

Land-use practices providing suitable nesting habitat should be encouraged, particularly increased acreage in pasture, hay fields, and natural grasslands. Mowing may enhance habitat quality but is best delayed until Aug to avoid destruction of nests and young, and ideally should be done only every 3–5 yr (Hays and Farmer 1990); haying also should be delayed (Luscier and Thompson 2009).

In Missouri, populations are most dense where grass is 10–30 cm high, presumably because moderate grazing (with a light scattering of forbs) produces a variety of cover heights for feeding, loafing, roosting, and nesting; a rotational system of grazing is advocated to maintain diversity of cover height and density (Skinner 1975). Severe grazing (grass height <10 cm) discourages nesting and foraging (Roseberry and Klimstra 1970, Baker and Guthery 1990). Native grasslands are less attractive after fire, probably owing to shrub mortality (Bock and Bock 1992).

Grasslands that are burned annually are likewise unattractive to Eastern Meadowlarks (Powell 2006), although in some cases the birds may respond positively to such fire (Reinking 2005). Nest success of Eastern Meadowlarks was lower in burned and grazed vs. undisturbed tallgrass prairie (Rohrbaugh et al. 1999). Nest survival increased with vertical density of vegetation in Kansas tallgrass prairie (Frey et al 2008). Patch-burn grazing, where burning is rotated inter-annually among patches within pastures, might allow for optimal habitat in tallgrass prairie rangeland (Fuhlendorf et al. 2006).

Abundance within such rangelands was lower when time since fire was <1 or >3 yr (Fuhlendorf et al. 2006, Powell 2008).

Grasslands on reclaimed coal mines supported Eastern Meadowlark nest success that was similar to that seen in other grasslands (prairie and agricultural), suggesting that grassland restoration and reclamation may be help conserve this species (Galligan et al. 2006). The species generally benefits from large habitat patch size (Herkert 1994; but see With et al. 2008), although even small patches can benefit these birds (Walk et al. 2010)."

- (b) Does the species have highly specialized habitat, resource needs, or other ecological requirements?

*The primary ecological requirement that might be considered “specialized” is acreage of available grassland. Grassland composition may also be important, but extent is probably the greater concern. Atwood et al. (2016) consider 60 acres to be a minimum size for grassland that might potentially support Eastern Meadowlark in Massachusetts. More study is needed to clarify the relative importance of field size and grass composition in determining habitat suitability. Most studies of the species’ ecology have been conducted in states that are distant from New England, such as Arizona, Texas, Wisconsin, Arkansas, Missouri, and Kansas. See Jaster et al. (2012, Conservation and Management, quoted above).*

Is dispersal ability poor?

*Given that Eastern Meadowlarks annually migrate from breeding areas in the northeastern U.S. to localities that may be several hundreds of miles away there is no reason to think the species has poor dispersal ability. Adults have “strong tendency for both sexes to return to former or adjacent territories” (Lanyon 1957). “Of 46 color-banded nestlings, only 1 found subsequently, on territory 0.96 km from natal area. Of 2 males color-banded as fledged juveniles, 1 was found the following year at a distance of 0.48 km from site where trapped “(Jaster et al. (2012).*

(10) **Conservation goals.**

What specific conservation goals should be met in order to change the conservation status or to remove the species from the state list? Please address goals for any or all of the following:

- (a) State distribution, number of occurrences (populations), population levels, and/or reproductive rates.

*Status needs to be further clarified through focused surveys. Preliminary work aimed at documenting current distribution within Massachusetts conducted in 2017 should be expanded in 2018 and 2019. Current information is primarily focused on presence – “absence” (undetected) studies; additional research will be needed to assess actual population numbers at known sites of occurrence, as well as details of breeding ecology within the state.*

- (b) Amount of protected habitat and/or number of protected occurrences.

*Status needs to be further clarified through focused surveys. Preliminary work conducted in 2017 should be expanded in 2018 and 2019. More study is needed to clarify the relative importance of field size and grass composition in determining habitat suitability. Although some of this work can be accomplished through the contributions of citizen scientists (volunteers), studies of specific habitat requirements will probably require small amounts of research funding.*

- (c) Management of protected habitat and/or occurrences.

*Status needs to be further clarified through focused surveys. Preliminary work conducted in 2017 should be expanded in 2018 and 2019.*

(11) **Literature cited, additional documentation, and comments.**

- Atwood, J., J. Collins, L. Kidd, M. Servison, and J. Walsh. 2016. Best Management Practices for Nesting Grassland Birds. Mass Audubon, Lincoln, Massachusetts.
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- Reinking, D. L. 2005. Fire regimes and avian responses in the central tallgrass prairie. *Studies in Avian Biology* no. 30:116-126.
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