A Survey of Bobolink in East Leverett Meadow June 2006

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Background

East Leverett Meadow (ELM) is a 30-acre grass and forb meadow owned by the Rattlesnake Gutter Trust and located in Leverett, Massachusetts. Bobolinks (*Dolichonyx oryzivorous*) currently nest in ELM but this species has declined regionally since the early 1990's due in part to the loss of nesting habitat and early mowing for hay. For these reasons the Trust is trying to encourage successful bobolink nesting at this site by studying bobolink use of ELM and by altering the mowing regime.

To accomplish these goals, annual surveys to assess bobolink activity in ELM have been conducted from 2000 to 2005. Aaron Eilers conducted the 2000-2002 surveys and I conducted last 3 year's surveys. The specific stated goals of these surveys were 1.) to identify the preferred habitat locations of bobolinks within ELM; 2.) to estimate the approximate number of bobolinks using ELM; and 3.) to compare data between years to determine whether the population is changing.

The ultimate purpose of the surveys is to plan and assess a mowing regime that will cause the least mortality to nesting bobolinks in ELM. Specifically the Trust is interested in knowing in which section of the meadow bobolink nests are located; how early ELM can be mowed or hayed without causing bobolink mortality, and whether the bobolink numbers each year are related to the mowing regime.

2006 Methodology

In order to make comparisons between years useful, I used the same survey method as last year, but observation times at each point were not uniform and ranged between 9 and 21 minutes per point, depending on how much bobolink activity was going on. This year I had an assistant who watched individual male bobolinks at each point to reduce double counting of the same bird.

The survey took place from 7:20 to 9:18 a.m. June 11. The temperature was 52° F at the start and 55° F when I finished. There was about 85% cloud cover and 15% sun, with a moderate to strong breeze. April and May have been unusually rainy this year, with at least 5 inches of rain each month, depending on where in the valley it was measured.

I used binoculars to help spot birds. Observations were made from seven points around the meadow. At each point two observation techniques were used. First I scanned with binoculars from one side of the meadow to the other, and could see bobolinks perched on the grass or flying. By scanning I could determine a minimum total number of male bobolinks because they were visible simultaneously or in distinct parts of the meadow. The second observation technique was to observe where individual bobolinks were perched and map their

locations by using compass bearings and estimating distances. I also mapped as many of the movements of individuals as possible.

I began by observing the meadow for 12 minutes from Point 1, along the south edge of the field at the corner of the Kusmeski Conservation Restriction (see map). From here I got a good view of the east half of the meadow and could also see some bobolink activity in the west end of the meadow. At the other six points I did not assume that birds at one point were different individuals than those at another point. Instead from each point I made a separate count that I could compare against the others like snapshots from different angles and points in time. Point 2 was located at the hickory along the south edge of the meadow. Point 3 was in the middle of the west edge. Point 4 was halfway between the Point 2 and the electrical tower directly north. Point 5 was at that electrical tower. Point 6 was the next electrical tower to the east, near another hickory tree. Point 7 was along the south boundary of the meadow near where the path enters from the bridge. No points were located east of Point 6 because no bobolinks were observed in that section of meadow. Instead I concentrated my efforts on the West and Central Meadow to try to better assess numbers there.

Results

Interpretation of maps

To aid in describing the different sections of the meadow, I divided a map of ELM into 6 sections: northwest, southwest, north-central, mid-central, south-central, and east (see map). Separate maps of the observations from each point are also included in this report. The maps show where bobolinks were observed perched. Odd numbers indicate males and even numbers indicate females. **Each different number represents different bobolinks and does not indicate number of bobolinks.** Numbers not connected by a straight line indicate either separate individuals or possibly an already observed individual that got counted more than once. Movements of a bobolink that I knew was a single individual are connected a straight line. The straight lines are not the actual flight path. In many cases, the flight paths of males looped over large sections of the meadow.

Point 1: 12 minute observation

From this point I observed two separate males in the west end of the meadow. No bobolinks were observed in any other section of the meadow. The two males observed seemed to be staying within the northwest quadrant.

Point 2: 10 minute observation

2 separate males were observed just south of the wet northwest quadrant. One of them stayed within the quadrant, and the other flew back and forth between the northwest quadrant and the powerline east of point 5.

Point 3: 21 minute observation

2 separate males were observed, one in the northwest and southwest quadrants, and the other in the mid-central quadrant. One female was also observed, and flew back and forth with the first male.

Point 4: 12 minute observation

From this point I observed a minimum of 2 and a maximum of 3 males, but no females. One male was in the southwest quadrant, with another flying between the northwest and mid-central quadrant. A male spotted in the northwest quadrant could have been a third male or he could have been the same male as the second one.

Point 5: 15 minute observation

Again I observed a minimum of 2 and a maximum of 3 males. One that was definitely separate was in the southwest quadrant. The other one or possibly two were in the mid-central quadrant. The latter male(s) were the farthest east of any bobolinks observed during this year's survey, but never went east of the eastern electric tower (point 6).

Point 6: 9 minute observation

The active area observed from point 5 was now quiet, with the only bobolink, a male, observed in the southwest quadrant.

Point 7: 10 minute observation

This point was added to make sure I didn't miss any bobolinks in the easternmost portion of the meadow, and to try one more count of males. I observed two separate males and one female. One male flew between the northwest and mid-central quadrants, and a male and a female were in the southwest quadrant.

Discussion

Sections of ELM used by bobolinks:

The sections of the meadow used this year were about the same as last year except that an even smaller area seemed to be used this year. Like last year the southwest section was the most heavily used, and the southern half of the northwest section was also used. The mid central quadrant was the third most used this year, just like last year. This year there were no bobolinks observed in either the north-central or south-central sections, whereas last year there was one bobolink observed in the north-central section. The east section has never shown bobolink activity, and this year was no exception in my study. However, Sheila Seaman and Mary Alice Wilson reported that in late May they observed 4 male bobolinks, including one in this eastern half of the meadow.

In summary, most of the activity this year was at least 100 feet from any edge and concentrated in the southwest section, south edge of the northwest section, and the mid-central section. Zero activity was in the east and south-central sections.

Estimated number of bobolinks:

This year the number of males observed was at minimum 2 and at maximum 3. In 2005 the minimum number of males was 2 and the maximum was 4. In 2004 the minimum and maximum number of males observed from one point was 4 and 7. In 2003 the minimum and maximum number of males observed from one point was 5 and 8. Eilers did not extract an estimate of bobolink numbers from his data from 2000 or 2001 but the map from his 2001 study appears to indicate more bobolink activity than in the years since I've been doing the survey. However the different method he used precludes a comparison with my studies.

This year only one female was observed in the whole meadow, whereas in all the previous years two different females were observed. Because bobolinks are polygynous and females tend to stay hidden in the grass, more females were possibly present than were observed.

There appears to be a diminishing number of bobolinks nesting in East Leverett Meadow over the last several years, but the cause is uncertain. One possibility is changing vegetative composition of the meadow. Much of the center and west sections is dominated by forbs, with perhaps 50% of the cover in goldenrod, milkweed and hedge bindweed as opposed to grass. Bobolinks like some herbaceous growth but this could be too much for them. Another

possibility could be erratic weather in the last few years. This year the unusually heavy amount of rain could have reduced nest success and possibly the adults would abandon unsuccessful nests. Last year the cold weather in May could have reduced breeding success. If re-nesting occurred the 2nd clutch may not have hatched and the adults tend to be more secretive before the hatch. Another possible cause for low numbers of nesting bobolinks is the accumulation of thatch. A controlled burn was supposed to occur this spring to remove thatch, but (ironically) the dry weather of early spring prevented this. Alternatively, perhaps fewer birds successfully migrated this year than in past years, possibly reflecting habitat changes in their wintering grounds. It would be illuminating to know if other New England bobolink nesting sites have experienced similar downturns in the last two years.

Implications for mowing or haying

The data I collected indicates that bobolink nests were very unlikely to be located in the east and south-central sections or in a 100 ft. zone along any edges. In addition, it is also unlikely that any nests are in the north-central section or the east half of the mid-central section. Mowing could be done in these areas at any time with a minimal chance of impacting bobolink nests. However, even though no bobolinks were observed flying into these areas, it is undetermined whether cutting here would impact the bobolinks' food supply. Also, this study did not focus on other bird species that may use this and other parts of the meadow. Red-winged blackbirds were definitely nesting in many parts of ELM, but I did not keep track of which areas they were using.

As for the active bobolink area of ELM, the decision of when to cut and whether to cut each year is complex and inexact. If hay quality is not an issue, then the earliest cutting should occur is August 15. While earlier cuts may not kill all young, they likely would kill at least some due to differences in fledge dates within the population and due to re-nesting of bobolinks whose nests failed the first time. The mid-August date also allows time for fledglings to learn how to find food, hide and survive before their food and cover is removed. Many useful references addressing this issue have been compiled by Sheila Seaman of the Rattlesnake Gutter Trust. I refer you to these documents rather than redundantly addressing them here.

The question of whether one year's mowing regime at ELM affects the next year's nesting cannot be answered because there are too many other factors that influence the bobolinks' survival from year to year. These include habitat conditions on their wintering grounds and mortality during migration. Also, it is impossible to tell if the same individuals are returning each year, or if they are being replaced with birds displaced from another breeding site.

Because vegetation changes have occurred that may be making ELM less attractive for bobolinks, re-seeding of the western part of ELM with native warm-season grasses should be considered to restore a higher percentage of grass cover.

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