



NEW JERSEY  
AUDUBON

# Grassland and Wildflower Meadow Maintenance

## Overview: Caring for Your Grassland

Fallow fields, wildflower meadows and restored grasslands provide habitat for an array of wildlife from grassland birds to box turtles to invertebrate pollinators. What these fields, meadows, and grasslands have in common is their early successional state. Meaning, these sites are a mainly open canopy dominated by herbaceous plants and scattered shrubs. In the East, open or early successional habitats will succeed into forest over time in the absence of disturbance, either manmade or natural. Without intervention, these pioneer communities lose the composition and structure that make them valuable to our grassland wildlife. In a natural system, these areas of early successional habitat are maintained by ecological disturbance.



Unmanaged field with invasive plants  
in South Jersey



Managed Grassland and Wildflower Meadows

Historically, wildfire, flooding, and grazing animals created disturbance that set back the successional clock by removing vegetation and opening up the seedbank to allow new pioneer species to move in. Typically, a 2 – 3-year regime of human-induced activities that mimic these historic disturbances is recommended. However, many factors such as the region, plant community, invasive plant pressure, and the surrounding landscape can influence how long you should wait between disturbance cycles. Depending on these factors and the resources that are available to you, prescribed burning, light shallow discing, mowing or haying, and/or raking are all tools that can be employed to replicate these natural processes. When starting this process, a natural resources professional can work with you to determine which of these tools would be the most appropriate for your management. While some tools may be more immediately impactful than others, they can all be essential to maintaining an area in a state of arrested early succession.



## Basic Concepts of Managing a Field for Wildlife

### **As a rule, the more often you disturb a site, the more open it will be.**

The longer you wait to “disturb” the site, the more shrub and tree cover will develop.

### **Regardless of the type of disturbance you use, all large fields should be broken up into thirds and disturbed on rotation**

If multiple small fields exist on a property, whole fields may be disturbed on a rotation instead.

### **Except for haying and growing season burns, management activities should be conducted February 1- March 31**

This ensures cover is left standing all winter and activities are completed prior to bird nesting season and when pollinators and wildlife are most active. Special circumstances may exist when fields may need to be disturbed during the growing season, but that should be determined by a professional.

## Prescribed Fire

Prescribed fire is defined by the US Forest Service as the controlled application of fire by a team of fire experts under specified weather conditions to restore health to ecosystems that depend on fire. Prescribed fire should be used wherever and whenever feasible to manage grassland ecosystems because of its benefits to the habitat and its cost-effectiveness as a management tool. The timing and frequency of fire can influence vegetation composition, and fields should be burned on a rotation. Installing firebreaks around fields is critical for safety.

### **Benefits of late winter/early spring aka dormant season burns:**

- Dormant season burns reduce fuel on the ground that has accumulated from the previous season's growth
- Burning in late winter can promote or favor native grass growth, but may only top-kill hardwood trees and shrubs
- If a field is burned on a rotation and some habitat is left standing, it can minimize impacts to wildlife
- The New Jersey Forest Fire Service's prescribed fire season occurs in this time frame, and the majority of prescribed burns are carried out at this time of year

### **Benefits of August/September aka growing season burns:**

- Growing season burns are far more effective at controlling hardwood trees and shrubs than dormant season burns.
- Generally, burning during the growing season can promote flower presence in a field
- Burning at this time of year can thin out thick stands of native grasses and promote wildflower growth.
- Burning during the growing season is challenging and can be impactful to wildlife in certain situations.



Trained prescribed fire personnel monitor a fire line at a burn in Virginia. Credit: Celia Vuocolo

Shorter fire return intervals (every other year) generally create grassier, open conditions. Longer fire return intervals (every 4-5 years) create shrubbier, “weedier” conditions because tree saplings are given more time to establish. Current plant composition and future management goals must be considered when developing a burn management plan for a grassland or meadow.

### **Prescribed fire should be applied by trained individuals and under the advisement of a burn plan and prescription.**

The New Jersey Forest Fire Service (NJFFS) should be contacted well in advance to assess a site’s compatibility with prescribed burning, for burn plan design and permitting, and to conduct the burn.

## **Light Discing**

Using a tractor (at least 75 hp) with a heavy offset disc can mimic soil disturbance that was historically created by large herbivores (bison, etc.). Discing breaks up thatch and allows seeds to be exposed to sunlight, which promotes germination.

### **There are two critical considerations:**

- 1 While discing, maintain a consistent depth of 1-2” prevents soil erosion and runoff.
- 2 Discing should not be used in areas prone to soil erosion. Disc along the contour of a field.

### **Choose a discing method depending on management goals:**

- 1 Strip discing: disc one pass (along the contour, if on a slope), skipping 2 disc-widths, discing a pass, skipping 2 disc-widths, and so on.
- 2 Block discing: break a field up into thirds, then disc entire blocks on a rotation.
- 3 Random discing: randomly meander through a field with the disc and stop when approximately 1/3 of the field has been disturbed. Repeat once a year. Random discing promotes the greatest plant diversity throughout a field.

A combination of discing and burning may be used to maintain the desired grass:flower ratio. Discing will be more efficient following a burn since the equipment does not have to cut through dense vegetative material. If there is heavy invasive or non-native plant presence in the field, speak with a professional before proceeding. Discing fields like this may exacerbate the situation and create a more significant problem.





Example of discing to improve grassland habitat.  
Credit: Missouri Department of Conservation

## Mowing

Mowing alone, and not in conjunction with prescribed fire or discing, is the least ideal method for maintaining a meadow or grassland. Mowing builds up thatch which inhibits travel for ground dwelling wildlife and prohibits some seeds from reaching bare soil to germinate. Mowing can suppress wildflower germination, thus decreasing the presence of forbs over time. However, mowing is often the only maintenance option available for projects in heavily populated areas and/ or in regions where equipment access or prescribed fire tolerance is a challenge.

### **Mowing Best Management Practices:**

Repeated mowing, overtime, may cause the meadow or grassland to favor grass species and reduce floral occurrence. If this happens, contact a consulting biologist or conservation professional to discuss the best ways to get the site back on track.

- Fields should be mowed in thirds on a rotation.
  - Sites should be mowed in sections on a yearly rotation, so that one part of the field is being managed every year. Sites that do not have significant tree regeneration can be mowed every two years. Mowing on a rotation allows some habitat to remain standing, which will help maintain overwintering insect populations and provide cover for overwintering birds and other wildlife.
- Rotational mowing should be conducted between February 1-March 31.
- Consider installing a flushing bar on your tractor. Flushing bars will help flush young birds and other wildlife away from the tractor.
- Mow your field slowly in a spiraling motion, starting from the inside of the field and working outwards. This will give wildlife and grassland birds time to escape.
- Fields should be mowed at a height of 8 inches or higher. Grassland birds are more likely to return to mowed fields if the grasses are left higher. "Raising the blade" can minimize mortality of ground-dwelling wildlife, like the eastern box turtle.
- Mowing may not adequately suppress saplings, so spot treatment with herbicide may be required.
- Monitor for invasive species infestations, no matter what the meadow management method is, and treat them according to professional recommendations and herbicide labels.



## Haying

Agricultural fields serve as surrogate habitat for many grassland bird species, due to the loss of native grassland across North America. Even non-native grasses that were planted for hay and livestock forage can provide nesting habitat for a suite of grassland birds. While mowing is often carried out as part of a maintenance regime to influence the vegetative composition of a field, haying differs from mowing. In a hayed system, old and new growth grass are harvested at the same time and removed from the site, typically close to the soil surface, which leaves very little standing vegetation for wildlife use.

To maximize the nutritional value of the hay, harvest typically occurs in May or June, during prime nesting season for ground-nesting species like grassland birds. In New Jersey, nesting season occurs between April 1st and July 15th. Mowing or haying during nesting season can result in an over 90% loss in nests. Supporting grassland birds by avoiding haying during nesting season will promote overall biodiversity on your farm.

### **Haying Best Management Practices:**

Delay the timing of your first cut until after the nesting season is complete (April 1st – July 15th)

- Roughly 80% of successful grassland bird nests will fledge by July 1st
- Harvesting hay later in the season after the nesting period may increase the tonnage of hay harvested
- Hay harvested late in the season can lose some digestibility and nutritional value. Some livestock may require nutritional supplements to account for this
- Hay harvested late in the season has relatively shorter drying times, facilitating better retention of carbohydrates and can have higher levels of calcium and phosphorous
- Late- harvested hay does not meet the nutritional needs of calving dairy cattle and finishing beef but may be marketed to producers raising mature cows. Additionally, alternative markets can be investigated, such as selling hay for mulch or mushroom

Adjust your mowing pattern to consider escape and screening cover

- Refer to Mowing Best Management Practices for more tips
- Leave small sections of grasses untouched as you mow to retain some habitat use.

Consider rotating which fields or sections of fields are hayed

- If a field is harvested early one year, mowing it late the following year will allow for extended habitat use
- The decision to harvest early, late, or rest will depend on weighing the pros and cons of maintaining a higher quality habitat with better drying conditions to the reduction in hay

If delayed haying or other management strategies are not feasible, use a flushing bar and raise the mowing deck to a height of at least 8" to reduce nest mortality as much as possible.

To learn more about suitable grassland and meadow maintenance on your property, contact New Jersey Audubon's Stewardship Department at

**[conservation@njudubon.org](mailto:conservation@njudubon.org)**

