# *ECOLOGY BASED PLANTING AND MANAGEMENT TECHNIQUES*

# Planting

# Three Legged Habitat Stool

# Prairie

Remove Competition

Herbicide or Physical Removal

Thin Thatch if Less Than 50% of Soil is Exposed to Light

Also remove 2nd wave from seed bank

Organic Installation:
Smothering (Don’t Forget the Second Wave)

# Sowing Seed: Large Scale

Drill Seeding is Precisely Targeted Disturbance

Hydroseeding:

- Ideally Scarify After Hydroseeding
- No Starter Fertilizer
- Apply Tackifier at ½ Normal Rate or to Achieve 50% Exposed Soil

# Sowing Seed: Small Scale

# Tall Drifts

Live Plants

Planting in Existing Vegetation

# Irrigation

J. E. Weaver

# Prairie Plants

## and Their Environment

*A Fifty-Year Study in the Midwest*

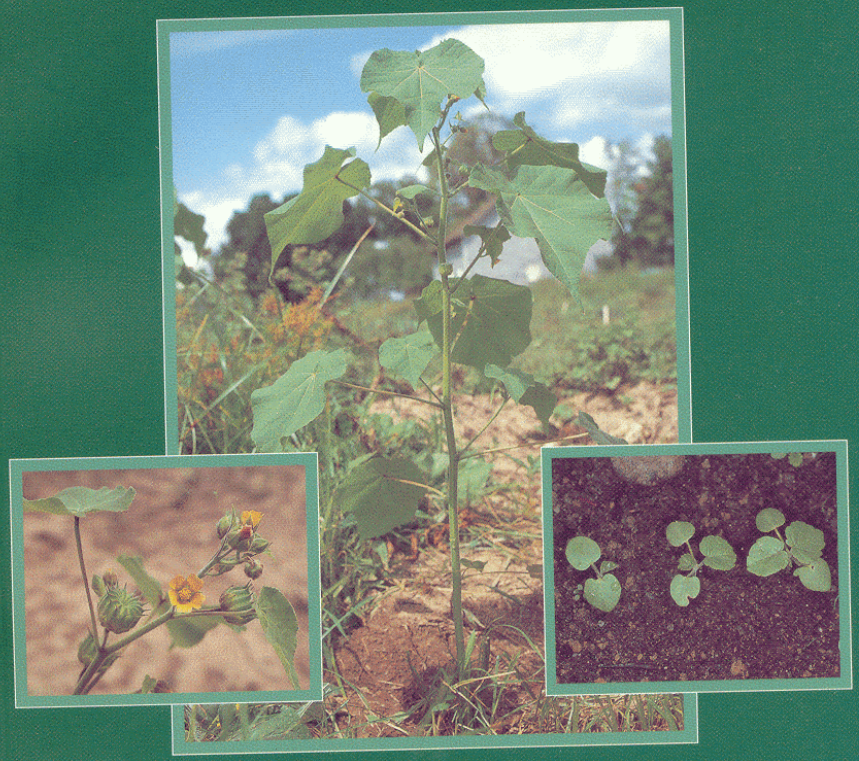


planted without disturbing the soil, into large steel drums that were filled with a well-screened potting soil at optimum water content. For blue grama, a lighter soil was provided by adding one-third the volume of sand to the potting soil. Thus, even during the third year of growth, all grass roots were kept in the containers and roots of other plants were kept out.

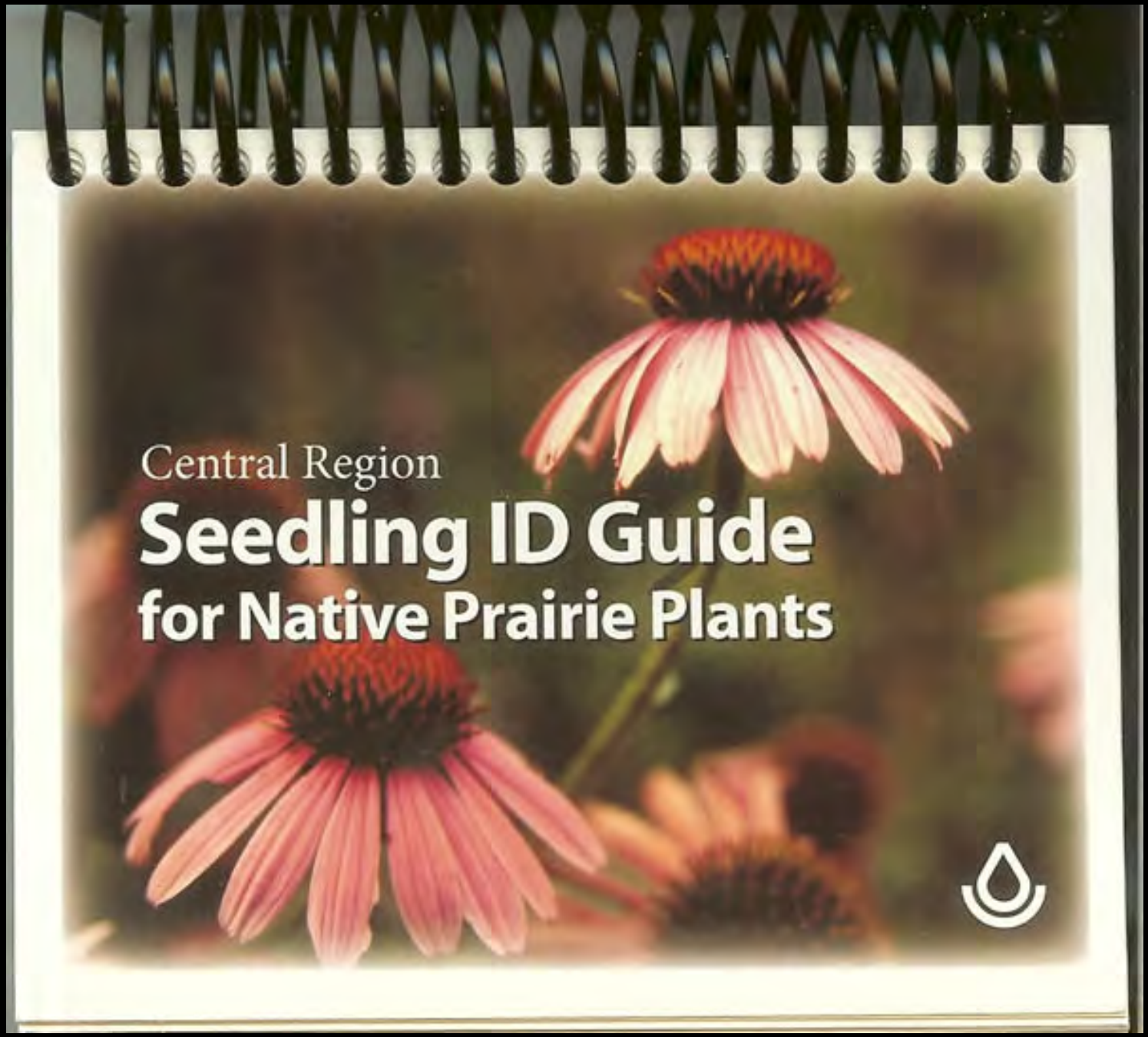
The drums were 34 inches high and 22.5 inches in diameter, and each had a 58-gallon capacity. They were placed in a trench and the plants were grown in a bluegrass lawn. Adequate provision was made

FIG. 48.—Root systems of *Bouteloua gracilis* on September 5 of the second summer. Root depth is about 32 inches.

# Weeds of the Northeast



RICHARD H. UVA
JOSEPH C. NEAL AND
JOSEPH M. DiTOMASO


Central Region
Seedling ID Guide
for Native Prairie Plants

# Shrubland and Old Field

# Clump vs. Clonal Shrubs

Active Planting: Plant in Masses in Oldfield Composition to Allow for Mowing of Meadow Areas

Arrested Succession

# Following the Path of Least Resistance

*Ecology* (1974) **55**: pp. 784–795

# CREATION OF RELATIVELY STABLE SHRUBLANDS WITH HERBICIDES: ARRESTING "SUCCESSION" ON RIGHTS-OF-WAY AND PASTURELAND[1]

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*Abstract.* Two decades of selective-use herbicide management on a demonstration right-of-way within the Connecticut Arboretum has resulted in a mosaic of relatively stable shrub communities and less stable herblands within the central hardwoods forest region. Areas of continuous dense shrub cover have resisted tree invasion for at least 15 yr. On abandoned pastureland shrub clones of *Gaylussacia baccata, Smilax rotundifolia,* and *Vaccinium vacillans,* from which associated tree growth was selectively removed, were analyzed for subsequent tree invasion. They have remained essentially stable for 5 yr, with virtually no tree invasion in the closed clones, as compared to pronounced invasion of the graminoid periphery of the clones. This stability can be explained in terms of Egler's "initial floristic composition" hypothesis for vegetation change, as explained in this paper. The ability of shrub communities to resist tree invasion has always belied the so-called classical concepts of succession and climax, as have the findings of other investigators. The substitution of the term "vegetation development" for "succession" and "relative stability" for "climax" would stimulate a more creative interpretation of vegetation dynamics.

Creating relatively-stable shrub communities by the selective use of herbicides has practical applications in right-of-way and wildlife habitat management, naturalistic landscaping, and the maintenance of habitat diversity.

*Key words: Climax; herbicides; rights-of-way; shrub stability; shrubs; succession; vegetation management; wildlife.*

## INTRODUCTION

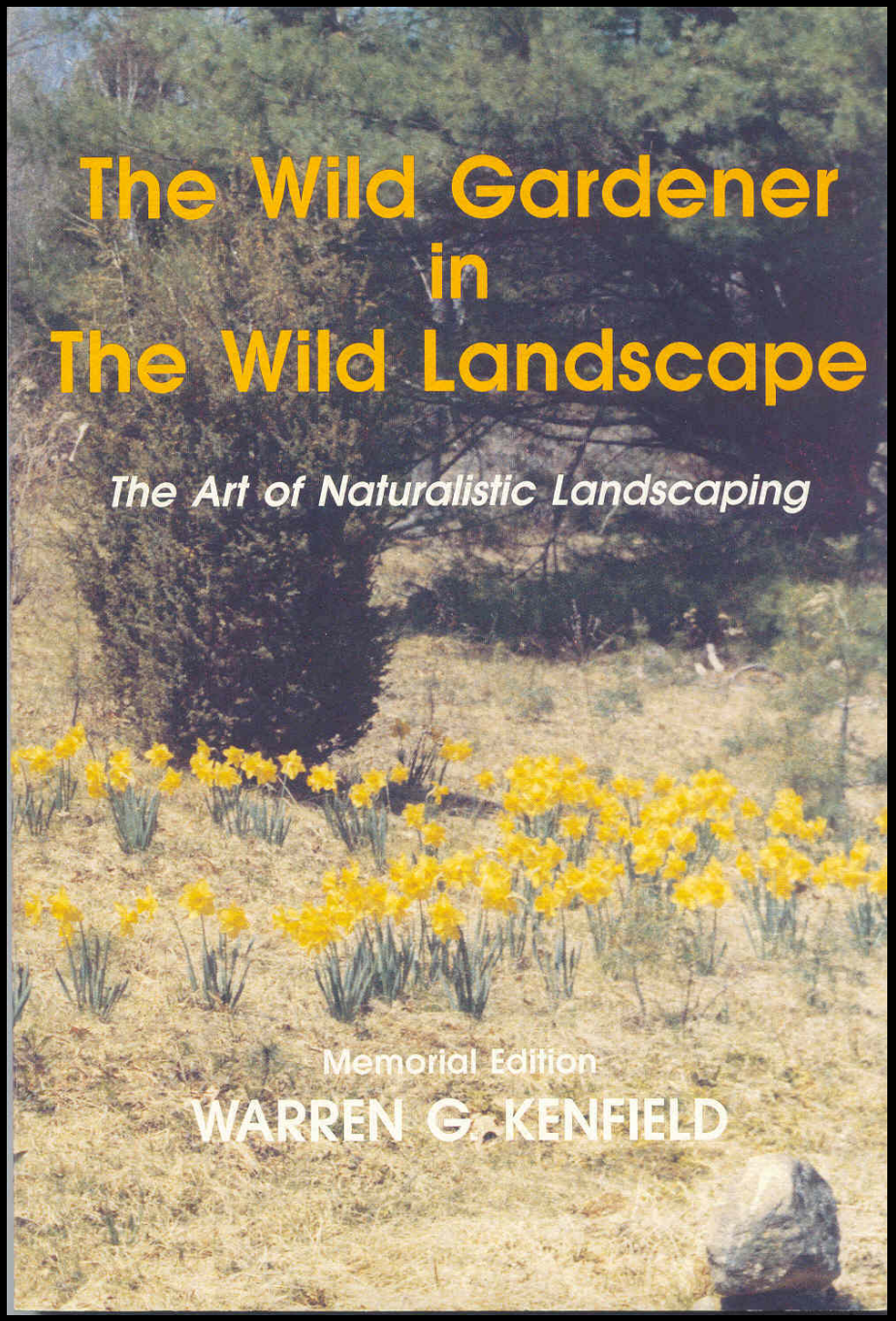
The impetus for this study was created by the broadcast and indiscriminate use of herbicides in commercial applications along electric transmission, telephone, railroad, and roadside rights-of-way. Following World War II the chemical industry increased the production of weed-killers and promoted their use in right-of-way "brush control." The clients included maintenance personnel with engineering background, but with little or no training in vegetation science. These circumstances led to the blanket spraying of hundreds of thousands of acres of rights-of-way during the 1950's and early 1960's (Egler 1958). In fact, this management procedure is continuing in certain parts of the country.

One of the classic cases reported was from New Jersey, where a roadside was sprayed 19 times in 6 yr with phenoxy compounds (Dill 1962–63). This treatment unnecessarily destroyed certain tree and shrub species, and also attractive broad-leaved flowering plants, and resulted in a relatively continuous cover of spray-resistant grasses. The plant cover produced was unstable, permitting the reinvasion of nearby trees and shrubs and creating a condition that required continuing maintenance.

This spray approach was sufficiently destructive to aesthetic and wildlife values along roadsides and utility lines in Connecticut to prompt the publication of two Connecticut Arboretum bulletins highlighting the problem (Goodwin and Niering 1959, 1962). Although the plant growth being sprayed was referred to as "brush" by the chemical industry and by those directly involved in its control, one was actually dealing with a very complex mosaic of plant communities composed of trees, shrubs, and perennial herbaceous plants (grasses and forbs) on a diversity of sites. As a result of the indiscriminate spraying, desirable species, especially those sensitive to the chemical treatment, were greatly reduced or eliminated. The extent of the destruction of native shrub and herb cover during this period has never been fully assessed. However, from observations in Connecticut, the losses were extensive. It was in response to this situation that the Connecticut Arboretum Right-of-way Demonstration Area was established in 1953. Here the objective was to employ ecologically sound techniques in right-of-way vegetation management. Selective applications of herbicides were used to create shrub communities with high stability and wildlife values. Subsequently other experimental areas were established.

The Connecticut Arboretum, comprising 363 acres, is located contiguous to the Connecticut College campus, in southeastern Connecticut. Vegetationally, it lies within the forest region designated as central hardwoods by Niering and Egler (1966) or central hardwoods–hemlock by Westveld et al. (1956) and

[1] Manuscript received June 20, 1973; accepted November 20, 1973.


The Wild Gardener
in
The Wild Landscape
The Art of Naturalistic Landscaping
Memorial Edition
WARREN G. KENFIELD

# Woodland: Existing Canopy

Removal of Undesirable Species

An Undesirable Second Wave

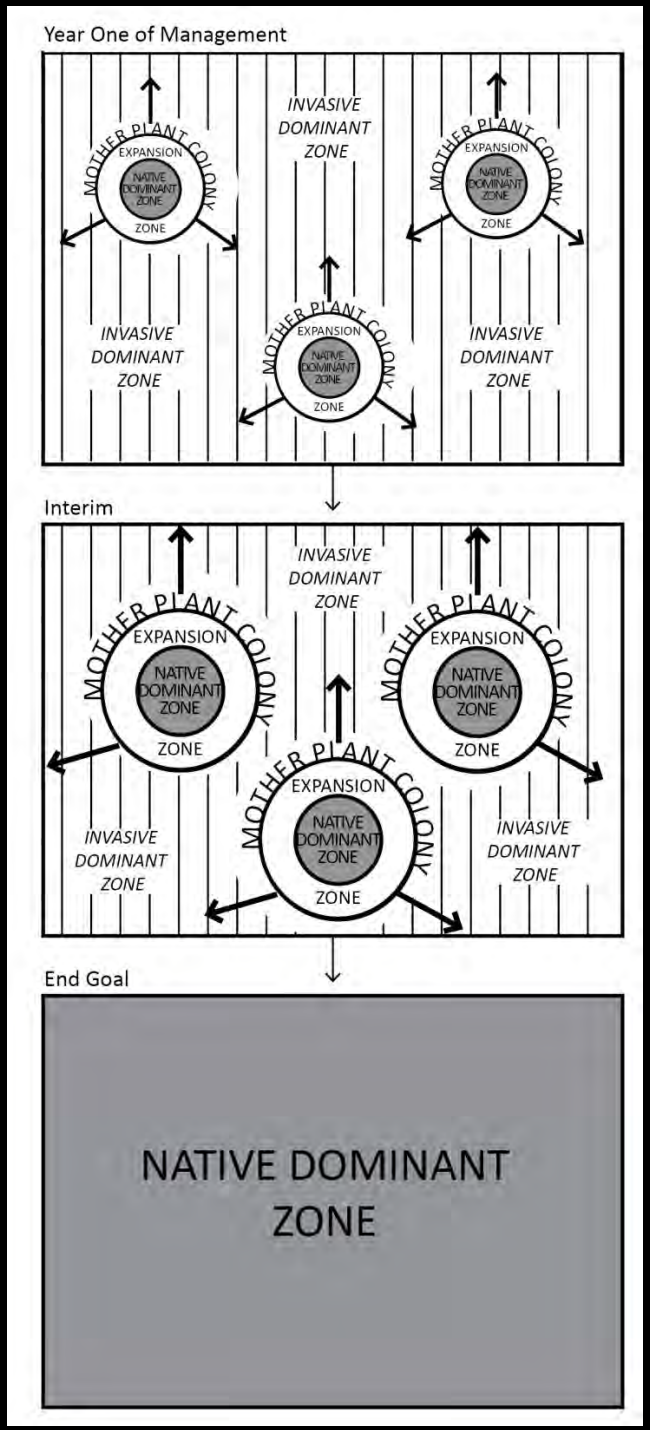
A Desirable Second Wave

Ground Layer Planting: Seed


http://hoffmannursery.com/plants/details/carex-rosea

Seedable Woodland Sedges List:

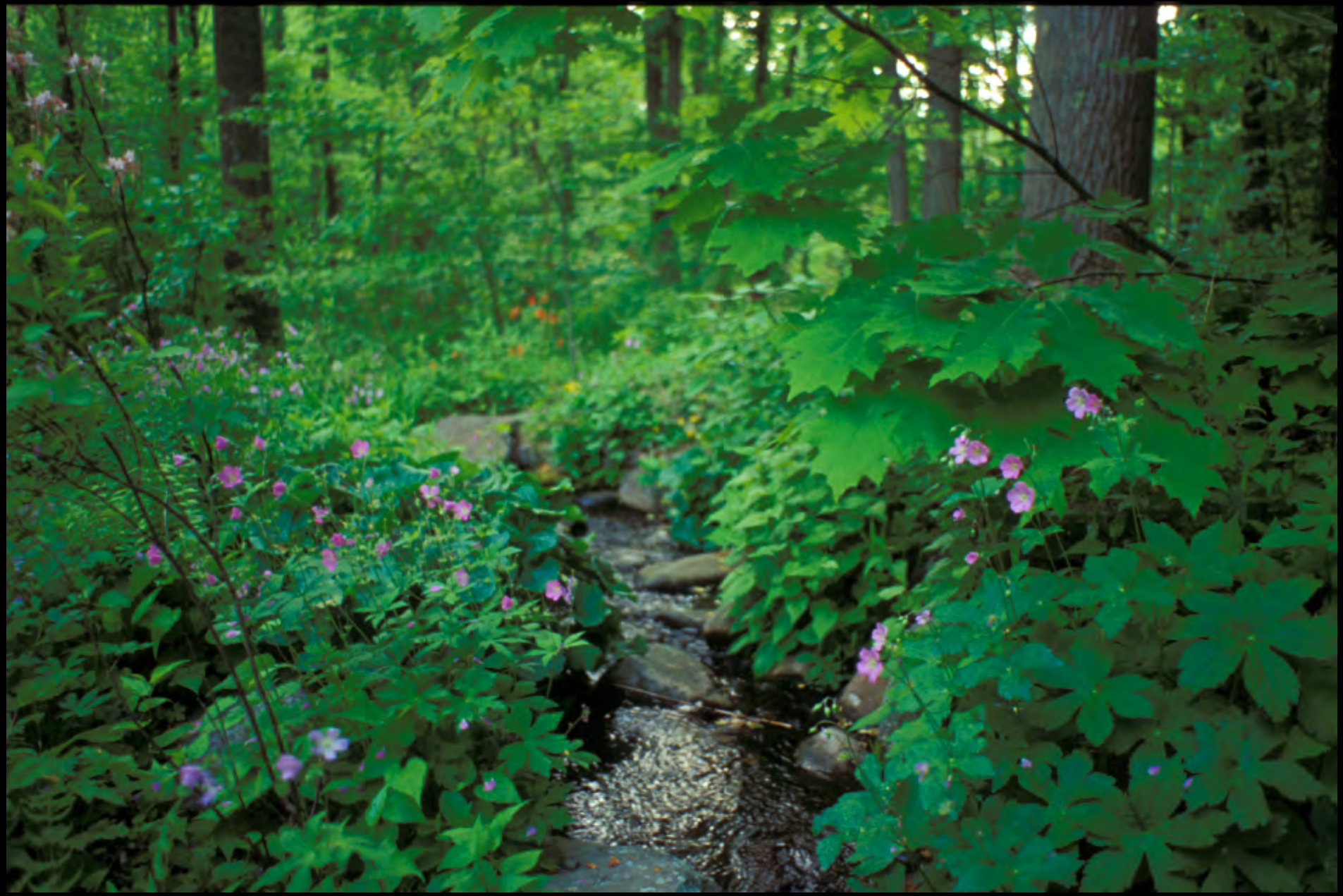
- Carex brevior
- Carex gracilescens
- Carex molesta
- Carex radiata
- Carex rosea




prepared by Larry Weaner Landscape Associates

# Ground Layer Planting: Live Plants

## *Expanding Seed Source Colonies*



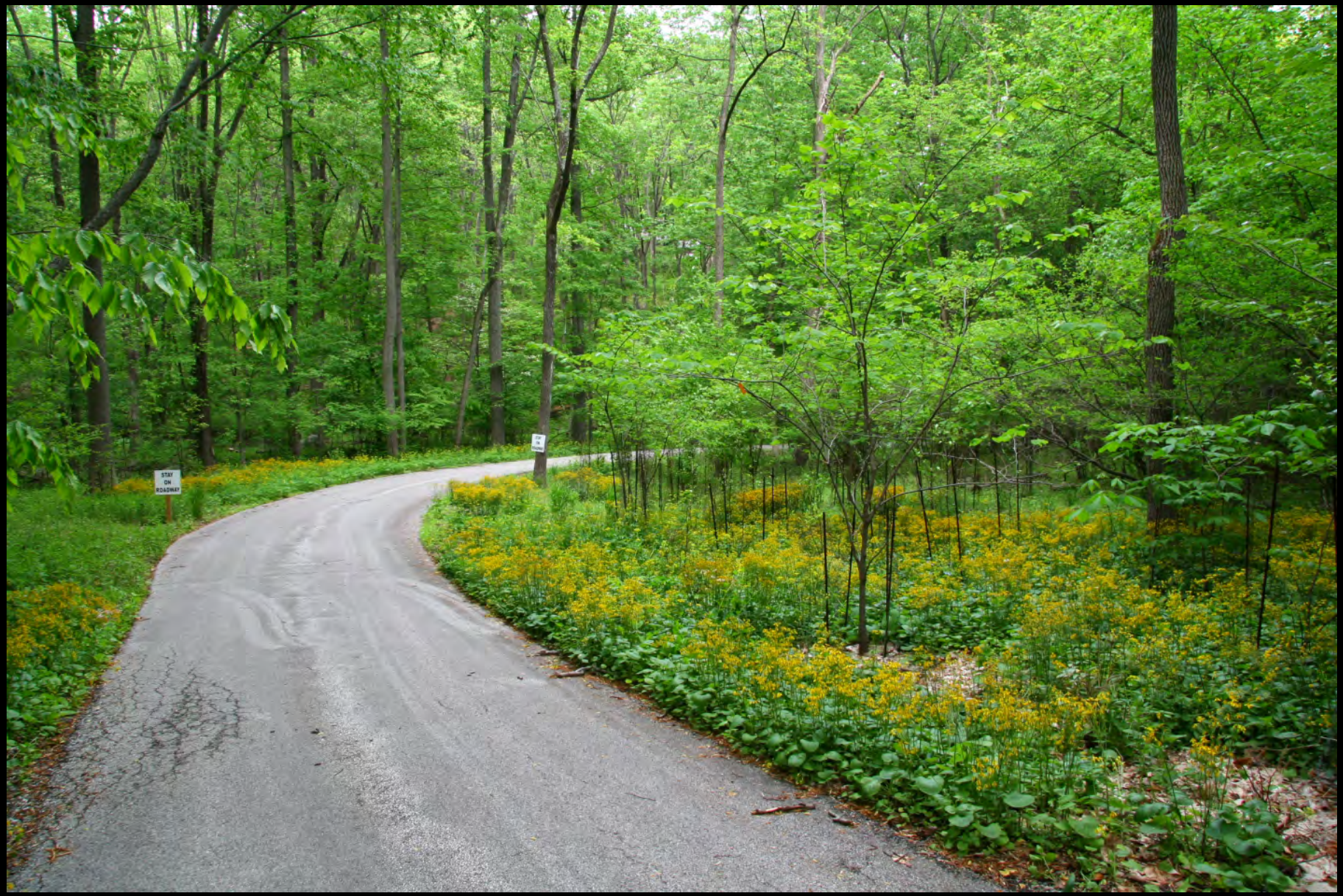
Segregating Aggressive Colonizers and Diminutive Accents

# Midstory Plantings: Trees and Shrubs

# Woodland: Reforestation

# Designing for Management

Allow for control by Planting Only Broadleaf Species or Live Plants




Trees Can Be Selected to Enhance
Diversity and Placed to Repair Canopy Disturbance

Photo by Mark Weaner - 2014

# Cultivars and Nursery Culture

https://worldoffloweringplants.com/echinacea-purpurea-white-swan-coneflower/

Echinacea purpurea ‘White Swan’

*Is This Recognizable to Pollinators?*

# Cultivars and Plant Functionality

http://thlandscapedesign.blogspot.com/2010/12/survival-of-fittest.html

“These Plants are junk”

United States
Department of
Agriculture

**Forest
Service**

Agriculture
Handbook 654

# Silvics of North America

## Volume 2. Hardwoods

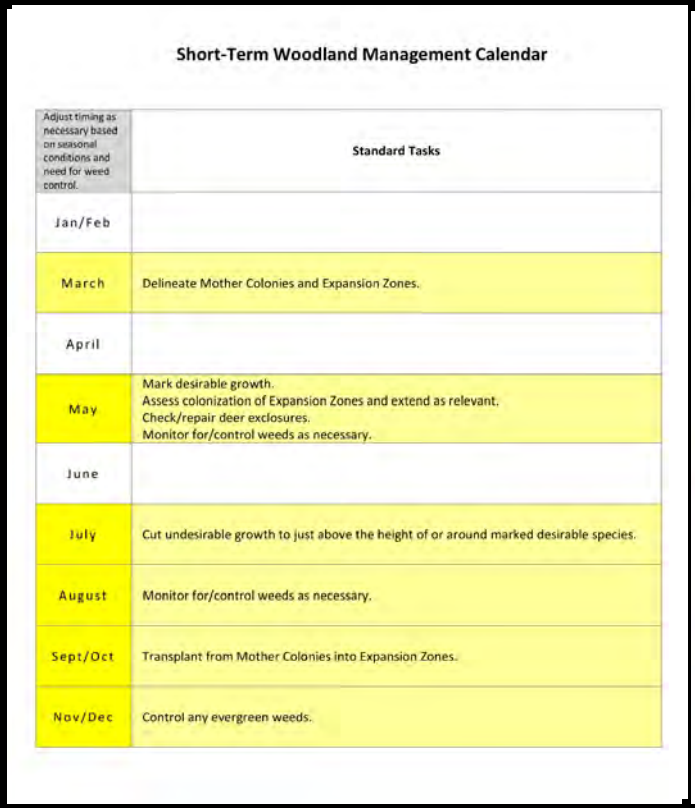
ANDROPOGON ASSOCIATES

# The Once and Future Forest

*a guide to forest restoration strategies*

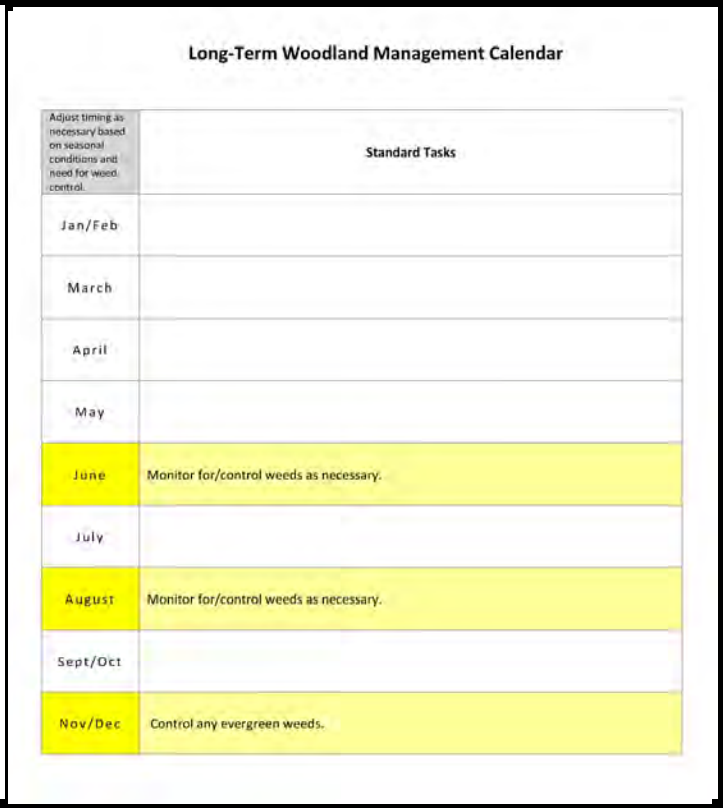
LESLIE JONES SAUER *foreword by Jan McHarg*

# Management
*Not Maintenance*



**Short-Term Woodland Management Calendar**

| Adjust timing as necessary based on seasonal conditions and need for weed control. | Standard Tasks |
|---|---|
| Jan/Feb | |
| March | Delineate Mother Colonies and Expansion Zones. |
| April | |
| May | Mark desirable growth.<br>Assess colonization of Expansion Zones and extend as relevant.<br>Check/repair deer exclosures.<br>Monitor for/control weeds as necessary. |
| June | |
| July | Cut undesirable growth to just above the height of or around marked desirable species. |
| August | Monitor for/control weeds as necessary. |
| Sept/Oct | Transplant from Mother Colonies into Expansion Zones. |
| Nov/Dec | Control any evergreen weeds. |



**Long-Term Woodland Management Calendar**

| Adjust timing as necessary based on seasonal conditions and need for weed control. | Standard Tasks |
|---|---|
| Jan/Feb | |
| March | |
| April | |
| May | |
| June | Monitor for/control weeds as necessary. |
| July | |
| August | Monitor for/control weeds as necessary. |
| Sept/Oct | |
| Nov/Dec | Control any evergreen weeds. |

# Early Vs. Late Stage Management

## Identify the Vegetative Goal and Alter Management Procedures Once that Goal is Reached

Prioritize Best to Worst

# General Weed Control

# Individual Shrubs: Cut and Paint


# Large Scale Woody: Forestry Mower

source: http://carolinatreecare.org/yahoo_site_admin1/assets/images/SuperTrak.217150938_std.jpg

Spot Control: Spray


Spot Control: Wick

# Mowing and Selective Cutting

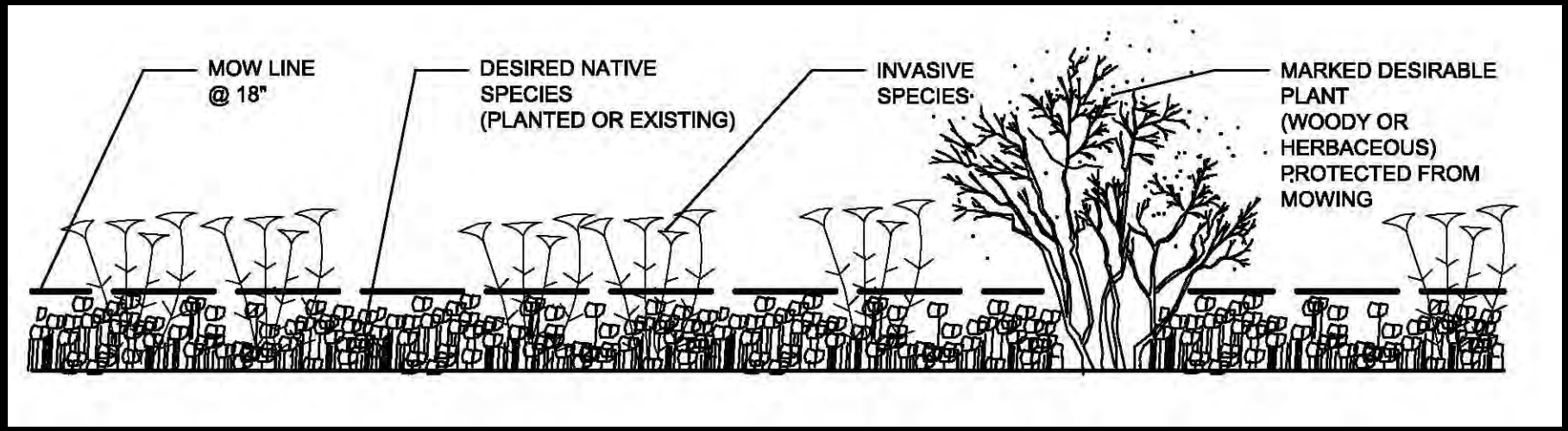
Annual Meadow Mowing

- Cut every 4”-6” every 6 weeks for first growing season
- Continue through following spring if cool season grass or cool season weeds persist

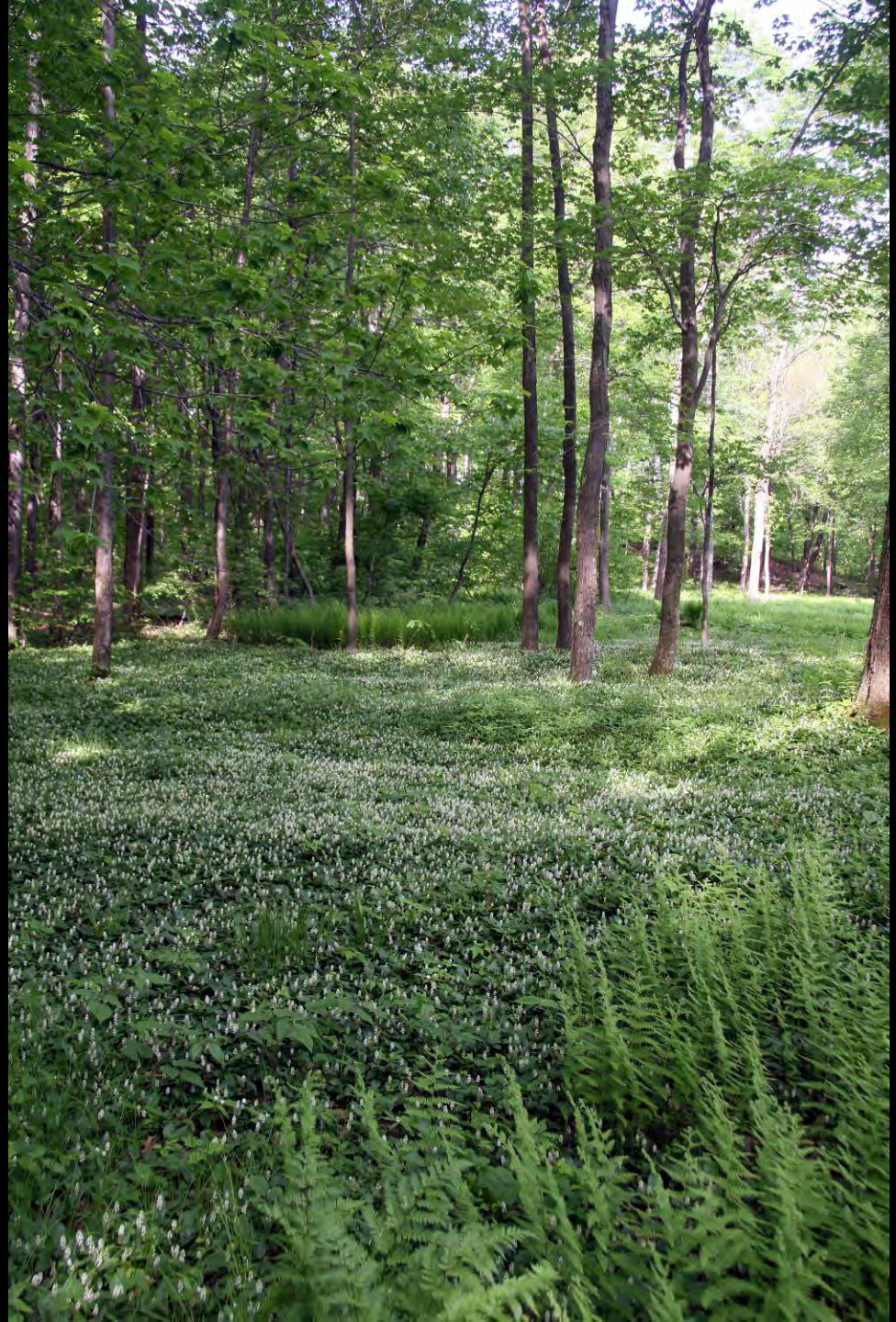
1. Annuals and Biennials
2. Perennials in Organic Program

Where Meadow Meets Turf:

- Managing Height Increase
- Managing Turf Invasion




Exploiting the difference



# Burning


DANGER
IMPACT AREA
LIVE FIRE WEAPONS RANGES
KEEP OUT
TRESPASSING OR REMOVAL OF ANY
ITEMS IS PROHIBITED

Annual Meadow Burning

# Weed Control

*Identify and exploit the differences between the desirable and undesirable species.*

Reversing Succession

Photo: Karen Bussolini

# Fostering Natural Recruitment