INDIANA DIVISION OF
FISH & WILDLIFE

Wildflowers

Habitat Management Fact Sheet

Corn Poppy

Clasping Coneflower

Portions of Indiana were once home to vast tracts of open prairie. A mix of grasses and wildflowers coexisted to form magnificent floral displays and complex and intricate plant communities. Wildflower prairies are important ecosystems to many species of butterflies, bees, mammals, and birds. These prairies, once abundant throughout the Midwest, are now one of the rarest plant communities in North America. Destroyed by modern land use practices, less than 0.5% of the original acreage remains. Wildflower prairies enhance biodiversity, provide important wildlife habitat, and restore the land to its natural beauty. Wildflowers can be reestablished in many areas of Indiana through careful site selection, site preparation, plant selection, and weed control and maintenance.

Site Selection

Choosing a suitable location is one of the most important steps in successful restoration of native wildflower prairies. Contrary to popular belief, scattering seeds on any open soil will not likely result in a patch of wildflowers. Many species of wildflowers are specific to certain soil types, soil moisture, or sun exposure.

Wildflower prairies are located in open, sunny spaces receiving 6 or more hours of full sunlight per day and having good air circulation. South, west, and east-facing slopes receive more sunlight so are warmer and drier and often good locations for wildflowers. North facing slopes are usually cooler, wetter, and receive less sunlight. North slopes are more suited to shade tolerant and cool season species which compete with desirable prairie plants.

Soil types are broadly classified as being either sandy, clay, or loamy. Sandy soils are loose, easy to till, and drain well, but usually contain less nutrients and dry out quickly. Clay soils are hard, difficult to work, and hold moisture. Loamy soil ranges between sandy and clay soil types. Loam soils are easier to work, hold moderate amounts of moisture, and are ideal for prairie restorations. Each type of soil can be utilized to grow wildflowers, however, selecting

the proper plants for the soil type will greatly increase successful establishment of a wildflower prairie.

Establishment of wildflower plots can occur on both small and large scales. Small tracts 100 square feet or less are ideal for backyards and can be used to replace mowed grass areas. Never select an area of land that will not grow grass or weeds; it won't grow wildflowers either. Larger tracts of land can be restored to wildflower prairies including property currently used for agricultural purposes, pasture, or other open areas. Wooded areas and wetlands are best left to function as those types of ecosystems.

Site Preparation

The most difficult aspect of raising and maintaining wildflowers is successfully establishing an initial population. Proper site selection is the first step in establishing a successful wildflower plot. Be wary of sites with a history of large weed populations or diseased plants. Any advantage that can be given to the wildflowers to reduce the competition for nutrients, water, and sunlight from other plants will aid in the establishment of a wildflower prairie.

Most areas chosen for wildflower prairies will be occupied by cool season grasses, such as fescue, or by "weeds". These plants need to be killed before the wildflowers are planted. Eradication of fescue is difficult but imperative for successful wildflower establishment. Methods of weed control include cultivation, herbicide application, and smothering. Smothering is the most basic technique for small plots. It involves covering the area with black plastic, plywood, or some other flat item. This is often cheap and easy but only works well for small areas. The covering must be left in place for one full growing season. Cultivation is laborious but can provide good results if done persistently. If there is a slope to the ground, soil erosion may be a problem. Refer to the ***Fescue Eradication*** Habitat Fact Sheet for information on controlling fescue by conventional tillage methods.

Herbicide application is the easiest, most effective and reliable method of preparing a site for reestablishment of a wildflower prairie. Herbicides with the active ingredient glyphosate, such as RoundUp®, are most effective in killing unwanted vegetation. This herbicide, when applied to the leaves of existing vegetation, will be taken to the root system, killing the entire plant. It can be used effectively and safely if all of the manufacturer's directions are followed carefully. Another herbicide beneficial in establishing wildflowers are those with Imidazoline as the active ingredient. Plateau® is the most popular herbicide with this ingredient. Imidazoline kills unwanted vegetation, both broadleaves and grasses, but does not harm many desirable species which are resistant to the chemical. Imidazoline provides residual control for up to 8 weeks and may be used in conjunction with glyphosate. Refer to the ***Fescue Eradication*** fact sheet for more information regarding the use of these herbicides when preparing to plant wildflowers. Table I provides a list of prairie grasses and wildflowers, some of which are resistant to Imidazoline.

Plant Selection and Planting Techniques

Wildflower prairies are most successful when the plants selected for the plot accurately match the soil type, soil moisture, sunlight exposure, and are planted properly. A large number of wildflower species were once abundant in Indiana. Many of these species are not on the market, difficult to obtain, or are expensive. Some species are also easier to establish than others and produce better results. These species can be found at many retailers in Indiana and around the U.S., and are available to be purchased by the pound or in bulk. Seeds or transplants can be purchased, with transplants working well for small areas and seeds ideal for large tracts of prairie.

Four basic methods exist for establishing wildflowers. Seeds can be no-till drilled into chemically treated sod, drilled into a prepared seed bed, broadcast over a prepared seed bed, or transplants can be utilized for quick results in small areas. Warm season grasses should be

incorporated into all seed mixes in order to more evenly spread seeds, control weeds, and provide the best possible wildlife habitat.

Warm season grasses grew with wildflowers in native settings and if **lightly** seeded provide minimal competition. If warm season grasses are drilled with the wildflowers, a drill with a planter box adapted for handling the chaffy grass seeds must be used. If broadcasting the seed, a good seed bed should be provided, and the seed broadcast with a hand spreader or by hand (on smaller sites). If fluffy seeds are being sown, mixing with a carrier of equal weight to the seed, such as kitty litter or sawdust, may ensure more uniform coverage. After broadcasting, the soil should be lightly raked to cover the seed no more than 1/4 inch, and then rolled or cultipacked to provide good seed to soil contact for the best germination.

Wildflower and grass seeds should be planted in the spring and early summer. Germination will not occur until the soil temperature reaches approximately 55 degrees. Seeding techniques, rates, and mixtures vary widely, and depend upon the results desired. The most common mistake in planting warm season grasses or wildflowers is planting the seeds too deeply. **Do not plant seeds deeper than 1/4 inch.** If possible, wildflowers should be watered regularly during the first growing season. After the first season, wildflowers do not need to be watered because those species are adapted to surviving in our climate. Fertilizer and lime do not need to be applied unless the soil is exceptionally degraded due to poor agricultural land use. Applications of fertilizer, prior to or at the time of planting, tend to cause excessive weed growth. The weeds, once established, shade the desired vegetation and aggressively compete for available nutrients and moisture.

Landowners may wish to plant wildflowers in an established warm season grass planting. Good establishment of wildflowers may be difficult to obtain due to competition of the existing grasses. The following method should provide the best results. Burn the grass planting in the fall when grasses are dormant (November would be a good time). Lightly disc the portion of the field to be planted. Disc no deeper than 3 or 4 inches and make only one pass. The idea is to only disturb the soil, not turn it or destroy the existing vegetation. The wildflower seed may then be broadcast or drilled.

The table below provides a list of many of the common grasses and prairie flowers.

Selected Native Grasses*				
Common Name	**Scientific Name**	**Sunlight[1]**	**Soil Type[2]**	**Moisture[3]**
Big Bluestem*	***Andropogon gerardii***	**F**	**B**	**A**
Little Bluestem*	***Schizachyrium scoparium***	**F**	**B**	**DM**
Indiangrass*	***Sorghastrum nutans***	**F**	**B**	**A**
Sideoats Grama*	***Bouteloua curtipendula***	**F**	**CL**	**D**
Switchgrass	***Panicum virgatum***	**F**	**B**	**MW**

***** Imidazoline (Plateau ® or similar product) resistant plants. Check label for rates and list of additional resistant plants.
[1] Sunlight: A=All (full sun, partial shade, full shade), F=Full sun, P=Partial Shade, S=Shade
[2] Soil Type: B=Broad range of tolerance, C=Clay, L=Loam, S=Sand
[3] Moisture: All=All(wet, moist, dry), D=Dry, M=Moist, W=Wet

Selected Wildflowers*				
Common Name	**Scientific Name**	**Sunlight[1]**	**Soil Type[2]**	**Moisture[3]**
Bee Balm*	***Monarda spp.***	**F**	**B**	**MW**
Black-Eyed Susan*	***Rudbeckia spp.***	**FP**	**B**	**MD**
Blazing Stars*	***Liatris spp.***	**FP**	**B**	**MD**
Blue Flax	***Lignum perenne***	**FP**	**B**	**MD**
Butterfly Milkweed	***Asclepias tuberosa***	**FP**	**B**	**MD**
Compass Plant	***Silphium laciniatum***	**F**	**CL**	**MD**
Cornflower*	***Centaurea cyanus***	**F**	**B**	**MD**
Goldenrods	***Solidago spp.***	**F**	**B**	**MD**
Great Blue Lobelia	***Lobelia siphilitica***	**FP**	**CL**	**MW**
Grey-Headed Coneflower	***Ratibida pinnata***	**FP**	**CL**	**MD**
Illinois Bundleflower*	***Desmanthus illinoensis***	**F**	**B**	**MD**
Indian Blanket*	***Gaillardia pulchella***	**F**	**B**	**MD**
Lance-Leaved Coreopsis*	***Coreopsis tinctoria***	**FP**	**B**	**MD**
New England Aster*	***Aster-novae-angliae***	**FP**	**B**	**MW**
Partridge Pea*	***Cassia fasciculata***	**FP**	**SL**	**MD**
Penstemon	***Penstemon spp.***	**FP**	**CL**	**M**
Plains Coreopsis*	***Coreopsis tinctoria***	**FP**	**B**	**MD**
Prairie Dock	***Silphium tetebinthinaceum***	**F**	**CL**	**M**
Purple Coneflower	***Echinacea purpurea***	**FP**	**CL**	**MD**
Rattlesnake Master	***Eryngium yuccifolium***	**F**	**B**	**A**
Sunflowers	***Helianthus and Heliopsis spp.***	**FP**	**B**	**A**
Tick Clover*	***Desmodium spp.***	**FP**	**CL**	**MD**
Wild Bergamot	***Monarda fistulosa***	**FP**	**B**	**A**
Wild Quinine	***Parthenium integrifolium***	**F**	**B**	**A**

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[3] Moisture: All=All(wet, moist, dry), D=Dry, M=Moist, W=Wet

Maintenance

Once established, wildflower prairies require minimal maintenance, however, proper care will ensure a healthy, diverse, and viable population of wildflowers and native grasses. Mowing, prescribed burning, and herbicide application all function to sustain a healthy prairie. Burning is the most effective method of reducing dead matted vegetation and stimulating new growth. The timing of the burn is important to enhance flower growth and discourage competing vegetation. The matted vegetation needs to be removed to allow the flowers to begin growing before competing vegetation begins growing. Burning can be conducted after the first frost in late fall or early winter, or you can wait until late winter. Cover and food for wildlife can be provided through the winter by waiting until late winter to burn. Also, by alternating areas being burned and rotating plots throughout the landscape in alternate years, a more diverse habitat can be provided.

Mowing once a month for the first year can reduce weeds and allow sunlight to reach the desired plants. Mow just above the tops of the desired plants to discourage competition with the wildflowers and grasses. After the first year of wildflower establishment, mowing can be done to prevent woody plant species from moving into the plot. It is important to mow only after the first hard killing frost, to prevent damage to flower stalks and buds. By alternating areas mown each year, valuable winter food and cover will be available for wildlife during the winter. If burning is not feasible, mow in the spring close to the ground and rake to remove thatch. If Imidazoline resistant plants have been used, application of the herbicide is very effective in controlling weeds and minimizing competition for desired plants during establishment.

Related *Habitat Management Fact Sheets*:

Strip Disking
Strip Mowing
Strip Spraying
Fescue Eradication
Warm Season Grass Establishment
Prescribed Burning

Prepared by the Indiana Department of Natural Resources, Division of Fish and Wildlife. For up-to-date information concerning the Indiana Division of Fish and Wildlife, or for information on the location of your District Wildlife Biologist, visit our website at www.wildlife.IN.gov
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