THE NATIVE PLANTING HANDBOOK

by TAYLOR CREEK RESTORATION NURSERIES

Welcome to Taylor Creek Restoration Nurseries

Taylor Creek Restoration Nurseries is one of the largest, most diverse native species nurseries in the Midwest. Perhaps, in the world.

As a nursery establishment, Taylor Creek took root 30 years ago in 1987 in the Avon Bottoms of the Sugar River in southern Wisconsin. As an idea, however, Taylor Creek was conceived as a gene bank for native plant species that needed preservation.

Species preservation could only happen by propagation, which for many species, had never been documented or even tried before. Early wild seed collection and experimentation with propagation led to discovery after discovery.

Early on, we also realized that species preservation could also only happen if the native species of the prairie, wetland and oak savanna ecosystems were somehow given economic standing.

In a most rudimentary way, economic standing meant that the ~1,200 native Midwestern plant species would be valued for reclaiming damaged land and for restoring land health, soil health and habitat for tens of thousands of plant, wildlife, microbes, and fungi that share these ecosystems.

There was no grand plan. But there was a three-pronged focus:

1. Invest in people who care, and create an ever-broadening culture of conservation centered around meaningful work and passion.
2. Learn the process, science and details essential to the conservation of native species.
3. Openly and honestly share what we learn with our professional colleagues, friends, clients, customers, regulators and others.

Today, as a science-based firm, Taylor Creek Restoration Nurseries remains committed our to original passion for native plants. And as a sister company to Applied Ecological Services, we proudly contribute to our conservation mission by sharing with all the healthy plants and seeds of the species we have preserved.

AES Mission: *To create ecologically-driven land-use solutions that are practical, economical and based on the best science and technology.*

Second Edition, 2018.

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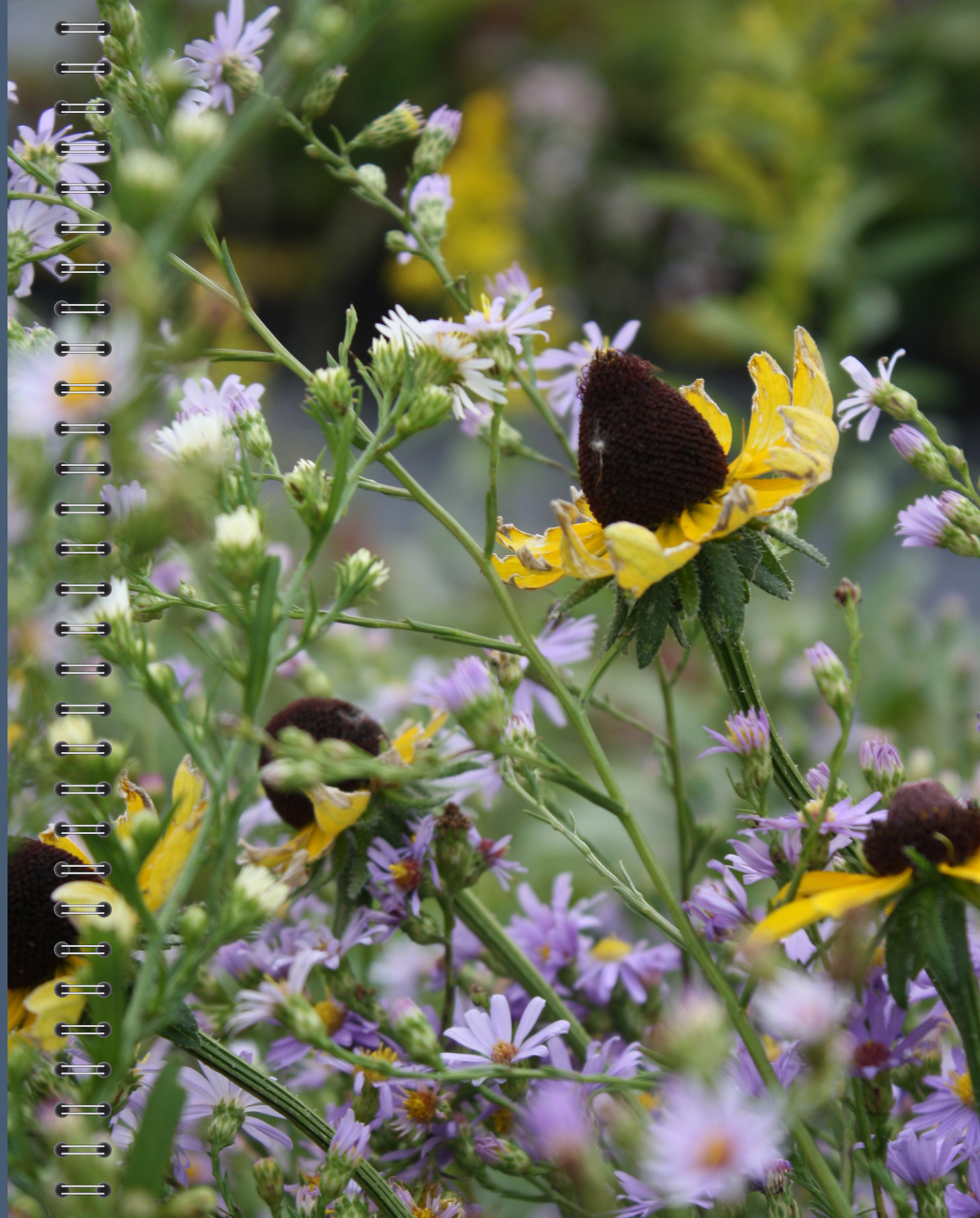
INTRODUCTION

Welcome to the second edition of Taylor Creek Restoration Nurseries' *Native Planting Handbook*. We hope you enjoy this publication, find it useful, and keep it as a valuable reference.

There continues to be great interest in native plants —the grasses, flowers, shrubs and trees that have been growing here in our region since long before settlers developed the land. Responding to that interest, new native nurseries and new informational resources have abounded. We welcome this growing popular interest — the potential to restore native ecosystems is as large as the earth itself.

In 1987, Taylor Creek Restoration Nurseries was first planted in the bottomland of the Sugar River. Today, with hundreds of acres in production of more than 600 native species — and satellite nurseries in Kansas, Indiana, and New York — Taylor Creek Restoration Nurseries is grateful for three decades of your support.



Native Ecosystems are certainly not “new,” but the science and art of replicating them certainly is.

As with anything new, there is a steep learning curve for newcomers. Whether you are a home gardener, a national gardening writer or a "green" industry professional, you know the importance of experience—of learning what works and what doesn't. Many native-plant providers and much of the new information are excellent, building upon basics learned from others with more experience in the field. But please be careful; no one wants poor-quality plants or bad information dooming any native planting effort. That could turn public sentiment wrongly against natives and the true benefits that native plantings offer. Success breeds success.

We have created this Handbook to help the native-habitat enthusiast succeed. We've had over *three decades* of experience growing and planting native plants and we are as dedicated to natives today as we were when we started. We know what works, and we know how to produce hardy plants, gather and store viable seed, and install and maintain plantings.

We encourage everyone—from dedicated do-it-yourselfers to professional contractors and landscape architects—to benefit from our experience and the experience of others who have been involved with native plants for decades. It is important to realize that many of the rules that apply to cultivars and traditional landscaping *do not apply to natives.*

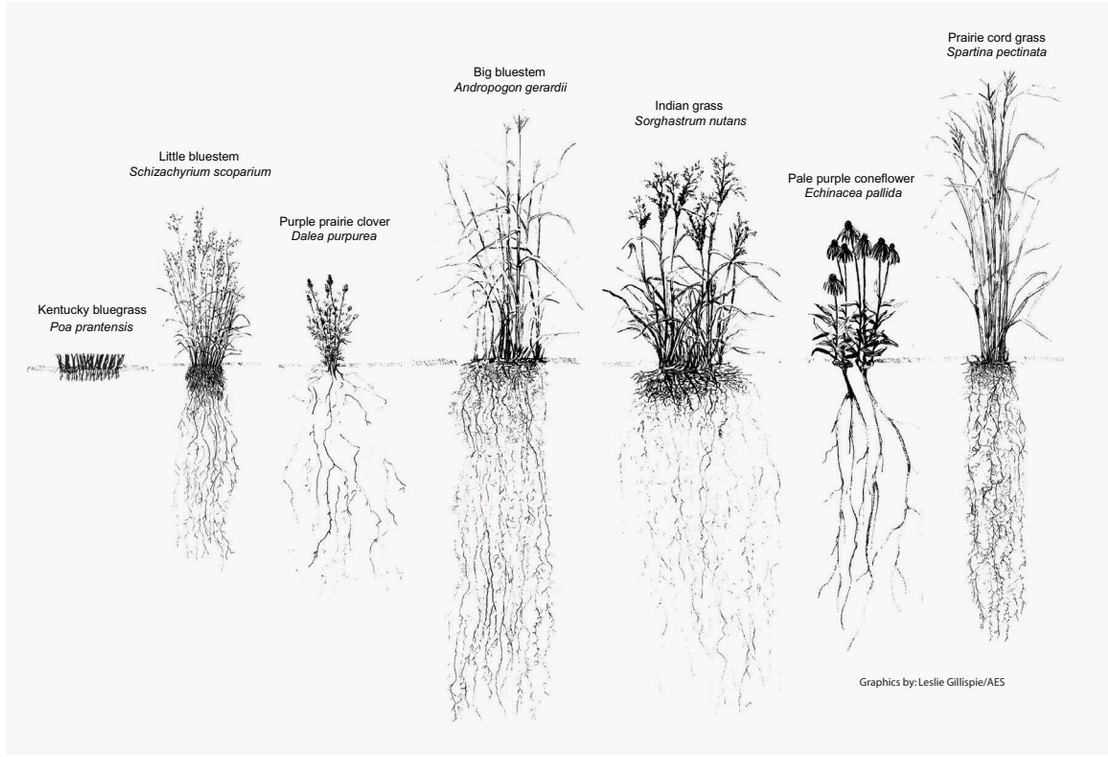
So our goal is to provide an aid, a primer of sorts, for professionals and native gardeners who design with and install native plants, shrubs and trees. It's good, solid, time-tested information that you can depend on.

To that end, we've included many useful tools, like planting instructions and techniques indexed by the different types of plants, soil types, and ecological and geographical areas. For easy reference, there is also a species list that includes native plants' size, habitat, as well as bloom color and bloom time.

Our Philosophy:
Work with Nature, Not Against It

Why are we so enthusiastic about native plants and trees? Natives are naturally adapted to local soils and climates. They're vigorous plants that produce a beautiful progression of blooms and textures throughout the year. They attract a variety of wildlife, birds, butterflies, and pollinators. They control, infiltrate and filter rainwater and runoff better than other species or man-made systems. And they simplify maintenance. Established native plantings will thrive and bloom without fertilizers, pesticides or watering, even in dry seasons when conventional turf lawns turn brown. Regular mowing is eliminated, and long-term savings through reduced use of lawn-care equipment, fertilizers and chemicals can be significant.

Root Systems of Non-native versus Native Species



Many native plants' root systems extend much deeper than cultivars or traditional lawn grasses. Some native-plant root systems can go down over 30 feet into the earth.

Our Goal:
Spread the Word about Native Plants

We want to convert others to native planting by offering high-quality, genetically appropriate, native flora and the expertise to use and care for them. Education is a big part of our mission, and our Restoration Nurseries will educate and support our customers and the public at large in their land-use decisions.

While this Handbook lists many species, it is by no means complete. We are continually adding more. Please call us for availability of other native species.

Our parent company, Applied Ecological Services, is a leading ecological consulting and restoration company with scientists and practioners working throughout the U.S..

Through them, we have direct access to the latest scientific research and practical application techniques relating to the use, propagation and management of native plants in ecological restoration and native landscaping projects. So please feel free to ask us questions.

With over 600 local genotype native species, our nurseries provide the *largest species diversity* of genetically appropriate seeds, plants, trees and shrubs in the Midwest for landscapes and restorations of native prairie, wetland, savanna and woodland. Our commitment is to maintain the highest integrity of native genetic diversity and source.

PROFESSIONAL POINTS TO PONDER

"Professional." "Ethical." "Green." "Scientifically valid." "Ecologically and environmentally sensitive." These are different ways of assessing choices, decisions and attitudes you may face in your pursuit and use of native plants. What you do in that little garden in your backyard can have far-reaching effects. Consider the gardener who brought Purple loosestrife (*Lythrum salicaria*) to North America a century ago. Or modern-day poachers who dig up centuries-old Saguaro cacti from the American desert to sell to landscapers. Or the people who buy those and other illegally wild-dug plants. Clearly, what we do with our plantings affects more than just our properties.

The *Ratibida pinnata* (Yellow coneflower)—above is a specimen from Minnesota; on the right is a specimen from Texas. While they are the same species, they are not the same *genotype*. In other words, they are different and should be treated as such.

Local Genetics:
Why We Talk About It So Much

"Native" merely means a *species* was present in the area before modern settlement of an area. "Local-genotype" however, means the *strains* are appropriate for the area. Those are very important details. Just because the *Ratibida pinnata* (Yellow coneflower) is native to your area doesn't mean the genotype you purchase has local genetics.

The genotype from Texas isn't the same as one from Minnesota, and you probably don't want to plant it in your prairie there. It probably won't do as well in upper Midwest growing conditions – if it survives at all – or it may do *too* well and take over.

Plants grown locally have adapted to local conditions over thousands of years. And by using a nursery that starts its production beds using seeds collected on *many* local sites, you can ensure this genetic strength.

Cost: There are many reasons, in fact, to use local-genotype materials. From a cost point of view, materials matched to the conditions of your site have a better chance of success, avoiding expensive reseeding and replanting.

Genetic "Pollution": Areas of your site that are within pollen and seed-distribution range can be negatively impacted by non-local genotype plant material. Non-local genotype plant material can create hybrids that normally would not occur in nature—so-called "ill-fated" hybrids—by introducing negative traits that will lower the overall fitness and survivability of a particular plant population.

Linking Fragments: Local genotypes can link fragmented populations. As urban sprawl continues, plant populations are becoming more isolated from one another.

Use of local genetic species increases the possibility of transfer of genetic material between these islands of plant populations. Non-local genotypes that are genetically incompatible with local genotypes can create infertile hybrids, and may create a "population sink" for any viable incoming pollen by keeping it from reaching the viable population.

Ecosystem Implications: The genetics within a plant species have huge implications on ecosystem interactions. Relationships have been formed over long spans of time between specific plants and other organisms. For example, certain insects have adapted to develop during the bloom periods of certain plants, or may be attracted by genetically based traits such as bloom time, color or scent.

Value and Protection: By using seeds produced from parent stock that was collected on remnant sites in an ethical manner, you help provide value to the owners of those sites. This is crucial because if they see their land as useless, they may be tempted to sell or develop it, obliterating one more native ecosystem.

Any change to these traits also affects any organisms that interact with those plant species. This can have a domino effect throughout an ecological community, causing species after species to fail. In addition, plant-pathogen interactions often develop at the local scale. Non-local genotypes may not have appropriate defenses, which may lead to dramatic increases in pathogen populations.

These are the reasons we are adamant in providing local-genotype natives. Local genotype plants and seeds can make the difference between success and failure of a project. Why risk your project when local genotypes are available?

Our Core

PRACTICE SCIENCE. Using research, we strive to find out what nature does and how. We use the scientific method to help us understand how to recreate what nature does.

Science tells us that native diversity is a cornerstone of healthy ecosystems. Therefore, we believe it is crucial to include as many appropriate species to the area as possible in your restorations. *All* species in a population contribute to the ecosystem and may be necessary for other plant, insect and animal species to survive.

APPLY EXPERIENCE. We apply what we've learned through research and our practical, hands-on experience. Taylor Creek Restoration Nurseries and AES staff have been working with native plants for more than 40 years, so we have a large reservoir of information to draw from.

Our highly trained and knowledgeable native-plant experts are a valuable resource as are our experts in related fields like ecology, geology, botany, landscape architecture, hydrology, soils science, engineering and ecological restoration management.

ACT ETHICALLY. Our commitment is to work, think and act to the highest ethics possible. And we encourage all of our customers, clients and competitors to join us in this. We believe that by doing the right thing we can make a difference.

If you are a professional, sooner or later, you will be asked to perform a service, use a technique or material, take an action or work with a company or person that makes you a little uncomfortable. So think hard. Your reputation and possibly an important piece of the ecosystem are on the line, as well as an important piece of public opinion. A native planting project in our field often represents our *entire* field to the general public, so please don't plant bad seed, literally *or* figuratively.

A Changing Climate Changes the Rules

While the cause of climate change may be hotly debated, the data is in. Spring is earlier, fall is later and weather is more extreme. How we react to the change is important.

Within the industry, our own debate has ensued. Do we help nature by attempting to predict future patterns and specifying plants from regions whose plant communities are adapted to the climate we predict? In the Upper Midwest, this means selecting materials from the hotter drier Great Plains according to models. Or, do we trust that nature has hedged its bets sufficiently, that local native plant communities are packed with enough genetic richness, to nimbly respond to change?

We at Taylor Creek Restoration Nurseries believe that nature has generally gotten in right and we humans have far too often gotten it terribly wrong when trying to second guess her.

When choosing what region to select your native seed and plants, we urge you to keep it local and keep it diverse. It's true that rainfall, temperature and humidity are forces in the shaping of natural communities, but when it comes to plants and their pollinators – there is no force greater than photo period. Photo periods are the minutes and hours of daylight. It is these that primarily trigger insect and plant activity, and for many plant species when seed should germinate. No amount of climate change will change the time of sunrise and sunset.

HOW TO CHOOSE HIGH-QUALITY NATIVE SEEDS AND PLANTS

One of the most common questions we are asked is, “How can you tell if seed or plants are of good quality?” This is an excellent question, simply because many of the rules we have learned for cultivars *do not apply to natives.* The following is by no means a complete listing of ways to judge quality, but it will help you better understand how to choose your native seeds and plants.

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Here are three perfect examples of what to look for when selecting healthy native plants. If these plant plugs were cultivars, you might consider them “root-bound.” But when you buy native plants, you’re buying roots. The first two to three years of a native plant’s life is spent establishing a deep and healthy root system. Ignore the top-growth. In fact, while healthy top-growth is fine, brown and shriveled top-growth can mean the plant is in its second year, and is ready to bloom in the next spring.

1. Basic Terminology

In discussing any topic, basic terms are always good to know. Here are a few for starters:

B&B: Stands for “Balled and Burlapped,” trees that are field-grown and sold with their root balls wrapped in burlap.

Cold Stratification: What a seed in the wild goes through when exposed to a winter. This is a signal to the seed that the next warm period it feels is – in fact – Spring, and that it can begin growing. Cultivated native seed is often stored in temperature-controlled environments and needs some form of artificial cold-stratification to begin growing. It promotes ready, more uniform germination.

Containerized: Live plants, shrubs and trees that are sold in containers or pots, the size of which are described using volume measures such as quart, gallon, 3 gallon, etc. These are changing because of legislation from state Departments of Weights and Measure, since a “gallon” container for a small tree may not be exactly a gallon. The new terms you might see for an old “one-gallon” plant, for example, might be a “trade gallon” or a “1”. Containers go from a “38 plug” (which was originally 38 plugs to a 10″x20″ tray) in its own small container (pot), up to a “trade 10 gallon” for a tree.

Cultivar: A plant selected and grown for certain desirable characteristics. These characteristics are usually appearance-related, such as height, bloom color, size, etc.

These do not support genetic diversity and are not representative of the wild-plant population, even if they began as wild native plants (and most cultivars didn’t). Many cultivars lack ample nectar or pollen for butterflies and bees to feed on or may be nutritionally sterile. Cultivars are given a descriptive name in addition to their botanical name; for example, one cultivar of *Schizachyrium scoparium* is known as “The Blues.”

Dormant Seeding : Planting seed outside of the growing season (between late fall and early spring) when the chances of seed germination is very low.

Forbs: Any herbaceous plant that is not a graminoid (see “Sedges, Rushes and Grasses”), usually with obvious flowers.

Grasses: See “Sedges, Rushes and Grasses”

Inflorescence: The flower cluster.

Local genotype: A population within a species that has a specific genetic makeup naturally adapted to a specific region. This means the *genotype* is indigenous to the area. While a plant from Texas and another from Minnesota may be the exact same *species*, each genotype is different in terms of acclimatization (what it’s used to in rainfall, temperature range, atmosphere/altitude, diseases, pests, predation, etc.).

Native: Any plant that occurs or grows naturally within a specific region. For us in North America, this is generally defined as having grown in the region before European settlement.

Origin: In standard nursery terminology, this refers to the source of the seed or plant species, meaning either where it came from or where it was grown. Neither necessarily has any relation to "native" or "local." Our nurseries use the term to refer to a species' genetic origin, the location of its original wild population, a.k.a., "G-0" or "Generation Zero." This is sometimes refered to as "Genotypic Origin."

PLS (Percent Live Seed): This is a measurement system used to guarantee the amount of viable seed within the quantity. A sample of seed is sent to a qualified, independent lab for testing. "90% PLS" indicates a lab has tested the seed and that 90% of it by weight is alive and viable. Not all seed is sold PLS because there are few testing protocols for natives and in some cases a very small amount of seed is available. Some seed is destroyed in testing , sowers may be reluctant to sacrifice the already tiny amount of seed for testing, preferring to instead sell seed "bulk."

Plug and Pot: A small live plant with root mass. These are usually grown in multi-celled trays. Plug and Pot sizes are described by a number; 32 (equivalent to a 2-1/2" Pot), 38, 50, 72, and 100 are common. These numbers indicate how many cells there are in a tray, which is approximately 10"x20" in size. Therefore, the larger the number, the smaller the plug size.

Restoration: Converting small or large landscapes back to their healthy natural state. In most cases, these are diverse planting functioning as ecosystems.

Root-pruned: The cutting or killing (air-pruning) of some roots to promote branching out and additional growth of roots.

Rotational burning: Burning *part* of an area on a 3-year rotation with other areas so that *all* areas are burned within the 3 years, yet some prairie is *always* left standing.

Rushes: See "Sedges, Rushes and Grasses"

Sedges, Rushes and Grasses: While all are of the Graminoid (grasses) family, these names indicate different subgroups. They can easily be distinguished by the stem characteristics described in a mnemonic: "Sedges have edges, Rushes are round, Grasses are hollow all the way to the ground."

Sedge stems, when twirled between the thumb and forefinger, actually feel triangular. Rush stems feel round.

Grasses stems, while usually roundish or oval, have nodes or leaves growing from the stem along their entire length.

Seed-bank: All viable seed contained within the soil.

Top-growth: The part of the plant above ground.

Wild-dug: Plants collected from the wild versus nursery produced.

Wild-gathered: Seed collected from the wild versus seed propagated from wild-gathered parent stock.

2. SELECTING A SOURCE

As with most products, the more reputable the source, the better the chance you have of obtaining high quality. Nurseries are required to be licensed in all states. If a nursery has been around for a long time, or if they are attached to reputable companies, it is a hint to their standards.

3. SELECTING SEED

When possible, native seed should be harvested from plants grown *under cultivation* rather than be wild-gathered. Wild gathering may have downsides:

- There is often no guarantee of the genotype or documentation of wild-gathered seed you might get from independent collectors.
- Wild gathering removes seed from the ecosystem and can affect that ecosystem.
- It may have been unlawfully collected.

Overall, wild gathering should be left to trained professionals who know how to avoid these potential problems.

Some other quality issues to consider:

- Seed should be purchased from a licensed source.
- If seed is not planted promptly, it should be stored properly in a cool (<65˚F), dry place.
- Be wary of over-cleaned seed. While appealing to the human eye, mechanically de-fluffing or de-hulling can damage seed and result in lower germination rates. Mother Nature put fluff on seed for a reason, and removing it from certain species can actually hinder germination and survival.

In all our nurseries, professionally and ethically wild-gathered seed is documented, professionally propagated, then those plants are harvested and their seed is prepared for use and/or sale.

- All legume seed should have a rhizobial inoculant added, so that the young plant develops nitrogen-fixing nodules.
- DO NOT use "Prairie in a Can." It usually contains mostly seed of annual flowers, not regionally native perennials and—therefore—absolutely not local. Most of the examples we've seen contain an inordinate amount of non-native annuals. In addition, you have no idea how long that can has been sitting on the shelf and, therefore, how much of the seed is viable.

4. SELECTING PLANTS

If possible, choose two-year or equivalent-sized plants because they're winter-hardy, more robust and blooming-size.

Realize, however, that if you choose two-year "blooming-size" plants, they may not be blooming when you purchase them (see Chapter VI, "How To Use Native Plants").

Make sure each plant has good root mass. Flip the pot over. There should be roots trying to grow out from the drain holes. This means the plant is healthy and trying to grow.

Don't worry about native plants that look root-bound. Native perennial plants are different from cultivars and put much more energy into developing root structure. The more roots, the more mature the plant.

Also, don't be romanced by pretty top-growth or discouraged by un-pretty top-growth. The upper part of a native plant is secondary to its health. This is probably the greatest switch when dealing with native perennials as opposed to cultivars: when you buy natives, *you're buying roots.*

Cultivated selections of natives have acted as a gateway, bringing attention and interest to the benefits and beauty of native plants.

Using cultivars can provide the assurance of form and performance but there are risks and sacrifices. The possible risks could include lowered attraction to native pollinators, poorer nutritional quality of pollen and nectar, possible lower resilience to climate, and contamination of local pollution gene pools.

A Few Tips

- For plants that have extremely dense root structures, use a knife and make three or four shallow, vertical slits down through the root mass just before planting. This will accelerate its growth.
- Some shriveled, brown growth around the base of the plant indicates that it is in its second year of growth, so it is more mature and closer to bloom.
- In general, you can plant live plants from late spring until early fall, several weeks prior to hard frost. For more detailed information and techniques for late fall planting, refer to Section 7.0, Frequently Asked Questions.
- The plants should be free of disease and insects. Close inspection will reveal any oddities or chewed areas.
- Native plants should be purchased from a nursery that propagates nursery-grown material. Avoid wild-dug plants, shrubs and trees for the same reasons you avoid wild gathered seed. Even if legally obtained, these plants were still taken from an existing ecosystem, damaging that ecosystem. There is also the added worry of pirating; as demand for native plants grows, more people are stealing plants and trees from public and private lands, then selling them. Do not encourage this practice. Another reason for piracy is that some plants—such as Trilliums and Orchids—are simply too difficult or expensive for most nurseries to cultivate.
- Protected species should be purchased only from a nursery with special permits (usually from the state) to sell these species.
- Try to include newly rediscovered species that are overlooked. By planting these overlooked species, you can help make sure they survive to be enjoyed by generations to come.

Beware of over-cleaned seed. Mother Nature put that fluff and other stuff on the seed for a reason. Some companies take it off to appeal to people, but that might not be in the best interest of the seed. (Shown: Anemone Cylindrica [Candle anemone or Thimbleweed] seed).

5. SELECTING TREES AND SHRUBS

We've seen a high rate of success with containerized shrubs and trees. There's less disturbance of the roots than in B&B plants and trees. Also, if not planted immediately, there is better survivability than with B&B plants.

With the slower-growing species (like hickories and oaks), containerized 3- to 5-gallon sizes show some added benefits:

- We've seen higher success rates and faster growth.
- Unlike smaller stock and seedlings, these trees tend to be above deer-browse height, helping to ensure future growth.
- Unlike large B&B trees, you don't need special equipment or a crew to plant these sizes.
- Root-pruned versions of these shrubs and trees seem to fruit faster.

TIP: Sometimes, larger B&B trees go into shock for the first two or three years, while smaller containerized trees will catch up in size.

Why spend the extra money if there's a chance the less expensive versions will end up just as large in the same amount of time?

There are usually two grades of native trees: Restoration Grade and Landscape Grade (also known as "Street Trees"). Landscape Grade trees have their lower limbs removed for convenience and symmetry. We've seen very little difference in growth and health, so this becomes a matter of personal taste.

Shrubs and trees can be planted throughout the growing season until the ground freezes. Water your plants, shrubs and trees moderately for the first few weeks if there is little or no rain. While native plants, shrubs and trees are hardy, planting shocks them to some extent. Also, if you experience drought conditions the first year, water your native plants.

If you are in a drought-prone area, use more plugs and containerized plants and less seed and B&B plants. With their denser root systems, containerized plants are more drought-resistant.

Within two years, native plants, shrubs and trees should be well established and require less maintenance.

Beware of over-cleaned seed. Mother Nature put that fluff and other stuff on the seed for a reason. Some companies take it off to appeal to people, but that might not be in the best interest of the seed. (Shown: Anemone Cylindrica [Candle anemone or Thimbleweed] seed).

NATIVE SPECIES LIST

This list is in no way comprehensive, but represents most species commonly available from growers. Also, this information is based on our staff's experience. Colors, bloom times, seeds-per-ounce and other specifics may vary regionally and by individual populations. And this information is far from exhaustive. Plants that are known to be toxic or poisonous are listed as such, but readers are warned that other plants may have toxic qualities that are as of yet unknown, and individual people may be sensitive to specific species that other people can tolerate. The same caveat applies to the Protected Status of certain listed plants. Official protected status listings are continuously updated, and our information is current as of the production date of this handbook. *NOTE: Not all these species will be available as local genotypes everywhere and all the time, so you will be wise to check availability* **before** *you begin the design phase of your project(s).*

Native plants come in as many types, sizes, colors, textures—even moods—as cultivars. The difference is that they are natives and, therefore, beneficial to nature and the ecosystem they are in. (They're also almost all perennials and don't have to be replanted every year.)

This list will help you identify the general appearance and habitat requirements of common native plant species in North America. The habitats listed for individual species are those in which the species can be found growing in the wild. It is intended as a general guideline to depict how a species is adapted. Most of the species listed can be successfully grown in a garden setting or in an appropriate high-quality restoration.

Emergent species can tolerate continually wet conditions and standing water.

Dry prairie species are generally low growing and adapted to droughty, poor soil conditions.

Mesic prairie species range from low to tall species (some over 6') and are usually found in soil conditions similar to agricultural crops.

Wet prairie species generally are of moderate height and can tolerate periods of soil saturation and inundation.

Savanna and **Woodland** species typically are somewhat shade-tolerant or are early spring bloomers.

Heights are those encountered in the natural setting and can be typically achieved in a formal garden setting. Flower colors listed are those generally recognized for that species. Slight color variations may occur in individual plants.

Bloom times indicate approximately when a species will bloom. The length of time a species blooms or when it blooms is dependent on many factors, including soil type and weather conditions.

KEY

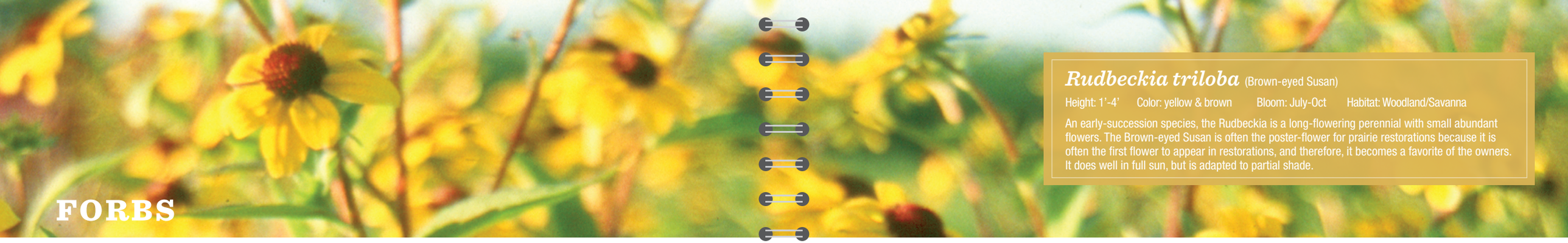
HABITAT

DP	Dry Prairie
WP	Wet Prairie
MP	Mesic Prairie
E	Emergent
WD	Woodland
WW	Wet Woodland
S	Savanna

REGION

UM	Upper Midwest
GP	Great Plains
NE	Northeastern U.S.
BF	Canada Boreal Forest

- Bird or Butterfly Attractor
- Rain Garden/Stormwater Swale Appropriate
- Deer Resistant
- Salt Tolerant
- Walnut Tree Compatible
- Erosion Control Appropriate
- Protected in some regions of the US. Check your local status, one suggested resource is http://plants.usda.gov
- Makes a nice cut flower



FORBS

Rudbeckia triloba (Brown-eyed Susan)

Height: 1'-4' Color: yellow & brown Bloom: July-Oct Habitat: Woodland/Savanna

An early-succession species, the Rudbeckia is a long-flowering perennial with small abundant flowers. The Brown-eyed Susan is often the poster-flower for prairie restorations because it is often the first flower to appear in restorations, and therefore, it becomes a favorite of the owners. It does well in full sun, but is adapted to partial shade.

Botanical Name	Common Name	Region	Height	Color	Bloom	Habitat	Bird, butterfly or bee attractor	Rain garden/swale	Deer-resistant	Salt-tolerant	Walnut-compatable	Erosion control	Protected in some areas	Makes a good cut flower	Seeds/oz	Description
Achillea millefolium	Yarrow	GP	1-3'	white	June-July	MP	•								178,250	
Acorus americanus	Sweet flag iris	UM, GP	1-3'	green	May-June	WP/E		•	•						6,600	Bright green leaf blades. Roots are valued for their reputed medicinal uses.
Actaea pachypoda	White baneberry	UM, NE, GP	1-2'	white	May-June	WD/WW/S							•		5,200	
Actaea rubra	Red baneberry	UM, NE, GP	1-2'	red	April-May	WD/S							•		4,450	
Adiantum pedatum	Maidenhair fern	UM	1-2'	green	May-July	WD							•		spores	
Agalinis tenuifolia	Slenderleaf false foxglove	UM, NE, GP	1-2'	purple	Aug-Oct	WP/MP/WW/S	•								800,000	
Agastache foeniculum	Lavender hyssop	UM	2-3'	purple	July-Aug	DP/MP/S	•								90,000	
Agastache nepetoides	Yellow giant hyssop	UM, NE	4-7'	cream	July-Oct	S	•				•		•		90,000	Monarch butterflies love this plant.
Agastache scrophulariifolia	Purple giant hyssop	UM, NE, GP	4-6'	purple	July-Oct	MP/WD/S	•						•		93,000	
Ageratina altissima	White snakeroot	UM, NE	1-3'	white	July-Oct	WD/S	•			•					150,000	Attractive white flowers, may dominate in a shaded setting.
Alisma subcordatum	Mud/Water plantain	UM, NE	1-2'	white	June-Sept	WP/E		•		•					60,000	Aquatic perennial; seeds attract waterfowl.
Alisma trivale	Large flowered plantain	UM, NE	1-2'	white	June-Sept	WP/E		•		•					66,000	Aquatic perennial; seeds attract waterfowl.
Allium burdickii	Narrowleafed wild leek	UM, NE	8"	white	June-July	WP/MP/WD/S									1,400	
Allium canadense	Wild garlic	UM, NE, GP	6"-18"	pink/white	May-June	WP/MP/S						•			560	Produces small edible cloves.
Allium cernuum	Nodding wild onion	UM	1-2'	pink/white	July-Aug	MP/WD/S	•		•			•	•	•	8,600	Its spherical inflorescence makes a great dried flower. Blooms and plant are edible.
Allium stellatum	Autumn onion	UM, GP	1-2'	purple	July-Aug	DP/MP/S	•		•			•			11,000	
Allium tricoccum	Wild leek	UM, NE, GP	1'	white	June-July	WD/S									1,400	Also known as ramps.
Amorpha canescens	Lead plant	UM, GP	1-3'	dusty purple	June-Aug	DP/MP	•								16,000	During the lead mining boom, miners believed the presence of this species indicated lead could be found in the soil beneath.
Amsonia hubrichtii	Arkansas bluestar	GP	1-2'	blue	April-May	MP									2,150	
Amsonia illustris	Shining bluestar	GP	1-3'	blue	April-May	WP/MP									2,150	
Amsonia tabernaemontana	Eastern bluestar	GP	2-3'	blue	April-May	WP/MP									2,150	
Anemone canadensis	Meadow anemone	UM, GP	1-2'	white	May-Aug	DP/MP/S	•	•					•		8,000	This plant's brilliant white blooms are great in shade or sun.
Anemone cylindrica	Thimbleweed	UM	1-2'	white	June-Aug	DP/MP									26,000	A simple specimen plant with pretty buttercup-shaped flowers.
Anemone quinquefolia	Wood anemone	UM, NE	4"-8"	white	April-June	WD									17,000	
Anemone virginiana	Tall/Virginia anemone	UM, NE	2-3'	white	June-Aug	MP/WD/S							•		28,000	A shade tolerant species with pretty buttercup-shaped flowers.
Anemonella thalictroides	Rue anemone	UM	6"-12"	white	April-May	WD/WW/S							•		13,000	
Angelica atropurpurea	Great angelica	UM	4-10'	white	May-June	WP							•		5,400	Large round clusters of white flowers and dark purple stems. Extensively used for medicinal purposes; however, sap from plants has been known to cause skin irritation.
Antennaria neglecta	Field pussy toes	UM, GP	4-10"	cream	April-June	MP	•								275,000	
Antennaria plantagrifolia	Pussy toes	UM	3"-16"	white	April-June	DP						•			275,000	

* New botanical names continue to be announced. A list of botanical aliases can be found at the end of the names listed here and are current per USDA National Plants Database at the time of printing.

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Rain garden/swale
Deer-resistant
Salt-tolerant
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Botanical Name	Common Name	Region	Height	Color	Bloom	Habitat	Seeds/oz	Description
Apocynum cannabinum	Indian hemp	UM, NE, GP	2-4'	white	May-Aug	WP/MP/WW/S	20,000	Monach attractor, also known as dogbane
Aquilegia canadensis	Wild columbine	UM, NE	1-3'	red and yellow	May-June	MP/WD/S	38,000	A showy sun or shade plant. Also a great hummingbird feeder.
Arabis glabra	Tower rockcress	UM, NE, GP	2-3'	white	May-July	DP/MP/S	345,000	
Arabis hirsuta	Hairy rockcress	UM, NE, GP	1-3'	white	May-July	DP/WD/S	260,000	
Aralia nudicaulis	Wild sarsaparilla	UM, NE	1-3'	white	June-Aug	DP/S		A member of the ginseng family
Aralia racemosa	Spikenard	UM, NE, GP	3-4'	green	July-Aug	WD	33,000	
Argentina anserina	Silverweed cinquefoil	UM, NE	6-9"	yellow	May-Sept	DP/MP/S		
Arisaema triphyllum	Jack-in-the-Pulpit	UM, NE	1-3'	green/red	April-June	WD	500	Great for deep shade areas!
Arnoglossum atriplicifolium	Pale Indian plantain	UM, GP	4-7'	white	July-Sept	DP/MP	6,000	
Arnoglossum plantagineum	Prairie Indian plantain	UM, GP	2-6'	white	June-Aug	WP/MP	4,700	Large lobe-shaped waxy leaves with strong parallel veination add interesting texture to the landscape.
Asarum canadense var. canadense	Wild ginger	UM, NE	6 - 12"	pink	April-May	WD	4,400	Excellent ground cover in shaded areas, does not tolerate partial sun.
Asclepias exaltata	Poke milkweed	UM, NE	3-4'	white	July-Aug	WD	3,000	
Asclepias incarnata	Swamp milkweed	UM, GP	2-8'	magenta	July-Aug	WP	4,800	Pretty magenta flowers and a butterfly attraction.
Asclepias purpurescens	Purple milkweed	UM, GP	2-4'	red-purple	May-July	S	4,500	
Asclpeias speciosa	Showy milkweed	GP	2-4'	pink-purple	May-Sept	MP	4,000	
Asclepias sullivanti	Prairie milkweed	UM, GP	2-5'	red	June-July	WP/MP	4,500	Similar to the common milkweed, but much less frequent.
Asclepias syriaca	Common milkweed	UM, GP, NE	2-4'	dusty pink	June-Aug	MP	4,286	Wonderfully fragrant, large blossomed and underappreciated.
Asclepias tuberosa	Butterfly milkweed	UM, GP, NE	1-3'	orange	July-Sept	DP/S	4,300	Its brilliant orange flowers are a monarch magnet.
Asclepias verticillata	Whorled milkweed	UM, GP	1-2'	white	July-Sept	DP/MP/S	11,000	A low growing milkweed, producing white flowers and small pods.
Asclepias viridiflora	Green milkweed	GP	1-3'	green	June-Sept	DP	3,600	
Asclepias viridis	Spider milkweed	GP	1-2'	green/pink	May-June	DP/S	4,300	
Astragalus canadensis	Canada milk vetch	UM, GP, NE	2-3'	cream	June-Aug	DP/WP/MP	17,000	
Astragalus crassicarpus	Prairie plum	UM, GP	1-4'	yellow	June-Aug	WP/MP/S	5,200	
Athrum felix-femma	Lady fern	UM, NE	1-2'	green	May-July	WD	spores	
Baptisia alba	White wild indigo	UM	3-4'	white	June-July	DP/MP	1,700	A semi-woody perennial with silver-green foliage and clusters of large white blossoms.
Baptisia australis var minor	Blue indigo	GP	3-4'	blue	May-July	WP/MP	1,500	
Baptisia bracteata	Cream wild indigo	UM	3-4'	cream	May-June	DP/MP/S	1,400	A semi-woody perennial with clusters of cream-colored flowers.
Bidens aristosa	Bearded beggarticks	GP	3-4'	yellow	Aug-Oct	WP	8,600	Smallest awns of the bidens, doesn't stick as easily as its cousins., Monarch's love it.
Bidens cernua	Swamp bur marigold	UM, GP	6"-12"	yellow	July-Oct	WP	21,000	Also known as "devil's pitchfork" because seeds, though easily removed, stick to clothes and fur.
Bidens frondosa	Common devil's beggarticks	UM	2-5'	yellow	July-Oct	WP/MP	5,000	Also known as "stick tights" because seeds, though easily removed, stick to clothes and fur.
Blephilia ciliata	Ohio horse mint	UM	1-3'	violet	May-Sept	WP/WD/S	400,000	A shade tolerant mint, frequently found in shaded hedgerows.
Blephila hirsuta	Hairy pagoda plant	UM, GP	2-3'	white	June-Sept	WW/S	240,000	
Boltonia asteroides	False aster	UM	3-5'	white	Aug-Oct	WD/WW/S	160,000	This plant is loaded with daisy-like flowers, it's also a great shade species.
Brickellia eupatorioides	False boneset	UM, GP	1-4'	cream	Aug-Oct	DP/MP	32,000	
Callirhoe bushii	Bush's poppy mallow	GP	1-2'	pink-purple	June-Aug	DP	4,000	
Callirhoe involucrata	Purple poppy mallow	GP	6"	purple	June-Aug	DP	2,100	
Caltha palustris	Marsh marigold	UM, GP, NE	8"-24"	yellow	April-June	WP	26,000	Large beautiful yellow buttercup shaped flowers are fabulous in moist conditions.

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Makes a good cut flower

As harbinger of spring in the wetland, Marsh Marigold (Caltha palustrus) is the first to bloom with color. Large beautiful yellow buttercup-shaped flowers are fabulous in moist conditions and are an important early season nectar source for butterflies and other native pollinators. The species works well in a poorly drained rain garden, in emergent settings, and in flood plains.

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Botanical Name	Common Name	Region	Height	Color	Bloom	Habitat	Bird, butterfly or bee attractor	Rain garden/swale	Deer-resistant	Salt-tolerant	Walnut-compatable	Erosion control	Protected in some areas	Makes a good cut flower	Seeds/oz	Description
Campanulastrum americana	Tall bellflower	UM, GP	2-6'	blue	July-Oct	WD/S	•		•		•			•	170,000	Long blooming bell-shaped flowers are unique to this species.
Cardamine concatenata	Toothwort	UM, GP, NE	6-12"	white/pink	April-May	WD/S									22,000	
Camassia scilloides	Wild hyacinth	UM, GP	1-2'	blue	May-June	DP/MP/S					•		•	•	4,200	May take several years to bloom, but spikes of purple-blue flowers are worth the wait.
Carex jamesii	Jame's sedge	UM, NE	10-12"	green	May-July	W/S	•									
Caulophyllum thalictroides	Blue cohosh	UM, GP, NE	1-2'	blue	April-May	WD/WW	•								70	
Chamaecrista fasciculata	Partridge pea	UM, GP	6"-36"	yellow	July-Sept	DP/MP	•								2,700	A soil building species loaded with yellow flowers.
Chamerion angustifolium	Fireweed	NE	1-4'	bright pink	July-Sept	MP/S	•	•					•		600,000	Culturally significant to the First Nation people of Alberta.
Chelone glabra	Turtlehead	UM, GP, NE	1-3'	white	July-Sept	WP	•	•						•	92,000	Flowers are large, deep-throated and ivory in color.
Chelone obliqua	Rose turtlehead	GP, NE	1-3'	pink-purple	July-Sept	WP									63,000	
Cicuta maculata	Water hemlock	UM, GP	3-6'	white	June-Sept	WP	•		•						12,000	Plant-parts and seeds are poisonous. A host plant to the swallowtail butterflies.
Claytonia virginica	Spring beauty	UM, GP, NE	6"-12"	white	March-May	WD/WW					•				24,000	Plants produce numerous pink and white candy-striped flowers. Underground parts are known to be enjoyed by bears.
Clematis virginiana																
Conoclinium coelestinum	Blue mistflower	UM, GP, NE	2-3'	blue	Sept-Oct	DP/WP/MP/S									350,000	
Coreopsis lanceolata	Sand tickseed	UM, NE	2-3'	yellow	May-Aug	DP/MP	•		•	•				•	16,000	A long blooming and low growing plant, its sunny yellow flowers make a great addition to traditional and native landscaping.
Coreopsis palmata	Prairie coreopsis	UM, GP	1-3'	yellow	June-Aug	DP/MP	•		•				•	•	10,000	Sunny yellow flowers for your native landscaping.
Coreopsis tripteris	Tall coreopsis	UM, NE	3-7'	yellow	July-Oct	DP/MP/S	•	•	•					•	14,000	
Corydalis sempervirens	Rock harlequin	UM, NE	2-3'	pink	May-Sept	DP/MP/WD/S							•		55000	
Dalea candida	White prairie clover	UM, GP	1-2'	white	June-Aug	DP/MP									19,000	White flowers in a thimble-shaped inflorescence, a bird and butterfly feeder.
Dalea purpurea	Purple prairie clover	UM, GP	1-2'	purple	June-Aug	DP/MP				•			•		18,000	Small bright purple flowers in a thimble-shaped inflorescence, a butterfly favorite and a bird feeder.
Delphinium carolinianum	Prairie larkspur	UM, GP	1-3'	white, periwinkle	May-July	DP/MP/S	•							•	41,000	Pale-blue flowers just as lovely as their cultivar cousins.
Desmanthus illinoensis	Illinois sensitive plant	UM, GP	2-4'	white	June-Aug	MP	•								4,200	Its fern-like leaves make this a great landscaping plant – flowers are remarkable. Called sensitive plant because leaves will curl when touched.
Desmodium canadense	Canada tick trefoil	UM, NE	3-4'	purple	July-Aug	DP/MP/S	•								5,500	Bird feeder and soil builder.
Desmodium cuspidatum	Bracted tick trefoil	UM	2-4'	pink	July-Aug	WD/S										A soil building species, seeds are produced in fuzzy pods that stick to fur and clothing.
Desmodium glutinosum	Pointed tick trefoil	UM, GP, NE	1-4'	pink	July-Aug	WD/S									840	A soil building species, seeds are produced in fuzzy pods that stick to fur and clothing.
Desmodium illinoense	Tick-trefoil	UM, GP, NE	3-5'	purple/pink	July-Aug	DP/MP/S	•								4,300	Bird feeder and soil builder.
Dicentra cucullaria	Dutchman's britches	UM, GP	5"-9"	white	April-May	WD/WW			•						17,500	Related to the bleeding hearts, the flowers of this woodland native resemble rows of white and yellow "britches" hung out to dry.
Dodecatheon meadia	Shooting star	UM	8"-24"	pink and white	April-June	MP/WD/S				•			•	•	60,000	This plant has beautiful pink, white or lavendar flowers shaped like miniature cyclamen and completely disappears underground after it sets seed. Deer love to nip off blooms so be prepared for short-lived color.
Doellingera umbellata	Flat-top aster	UM	1-4'	cream	Aug-Oct	WP/S	•							•	67,000	Cream-colored fluffy blooms in an umbrella-shaped inflorescence; thrives in moist soils or partial shade.
Echinacea angustifolia	Pale Purple coneflower	UM	2-4'	pink/purple	June-July	DP/MP	•		•					•	7,000	Large flowers with pale lavender petals that droop from a dark center, a natural landscaping staple adapted to dry soils.
Echinacea atrorubens	Topeka coneflower	GP	2-3'	purple	May-June	DP/MP									7,000	Only found naturally in Kansa, Oklahoma and Texas.
Echinacea pallida	Pale purple coneflower	UM, GP	2-4'	pink/purple	June-July	DP/MP	•		•				•	•	5,200	Very similar to *E. angustifolia*.
Echinacea paradoxa	Yellow coneflower	GP	2-3'	yellow	June-Aug	DP/MP	•		•						5,000	Found in the Ozark.

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A hallmark of the prairie, Shooting Star (Dodecatheon meadia) is one of the most beloved of our native species. A whirl of smooth moss-green basal leaves appears in early April followed by clusters of elegant white, pink or lavender blossoms. By July, leaves disappear leaving only chestnut flower stalks and seed capsules behind. Even young plants of this species are highly drought-hardy.

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Echinacea purpurea	Purple coneflower	UM	2-3'	purple	June-Oct	DP/MP	6,600	Like *E. angustifolia* with a more vibrant purple color, petals stand out more crisply from center, appropriate for heavier soils.
Echinacea simulata	Glade coneflower	NE	2-3'	pink	June-Aug	DP/MP		
Echinocystis lobata	Wild cucumber	UM	vine	white	June-Oct	WD/S	100	Annual blossoms have a noticeable lovely fragrance.
Echinodorus berteroi	Burhead	UM, GP	1-3'	white	July-Sept	WP/E	107,000	
Enemion biternatum	False rue anemone	UM	5-9"	white	April-June	WD/WW/S	11,000	
Epilobium coloratum	Cinnamon willow herb	UM, NE	1-3'	pink	July-Aug	DP/MP	250,000	Tolerates both alkaline and acidic soils. Culturally significant to the First Nation people of Alberta.
Erigeron annus	Annual fleabane	UM	6"-24"	white	May-Oct	DP/MP	315,000	Annual, looks similar to chamomile but should not be used as a tea.
Erigeron pulchellus	Robin's plantain	UM, NE	1-2'	white	May-June	MP/WD/S	315,000	
Eryngium yuccifolium	Rattlesnake master	UM, GP	1-4'	white/green	July-Aug	DP/MP	7,500	This spiny looking plant is reminiscent of the Southwest's yucca plant, a butterfly host plant and an interesting specimen plant.
Erythronium albidum	Trout lily	UM, NE	6"-9"	white	April-June	WD	2,000	So named "trout lily" or '"fawn lily" because of its mottled leaves. This early bloomer makes an excellent groundcover and is a sensational early spring bloomer with relatviely large white flowers.
Eupatorium altissimum	Tall boneset	UM	4-6'	white	Aug-Oct	MP/S	50,000	Similar to *Eupatorium perfoliatum*, but native to the uplands.
Eupatorium perfoliatum	Common boneset	UM, GP, NE	2-4'	white	July-Oct	WP/MP	160,000	Great buffterfly plant, tolerant of wet soils.
Eupatorium serotinum	Late boneset	UM, NE	3-5'	white	Sept-Oct	WD/S	61,000	Similar to *Eupatorium perfoliatum*, but shade tolerant.
Euphorbia corollata	Flowering spurge	UM, GP	1-3'	white	June-Sept	WD/S	8,000	An excellent dried flower. Beware of sticky sap that can irritate eyes upon contact.
Euthamia graminifolia	Grass-leaved goldenrod	UM, NE	1-4'	yellow	June-Oct	WP/MP	350,000	A low growing goldenrod, with an umbrella-shaped inflorescence. Tolerates saturated soils.
Eutrochium maculatum	Spotted Joe-pye weed	UM, GP, NE	2-6'	pink	July-Sept	WP	95,000	A great butterfly plant! Also an attractive addition to your prairie garden with large fluffy purple inflorescence adapted to heavy soils.
Eutrochium purpureum	Purple Joe-pye weed	UM, GP, NE	3-6'	dusty pink	July-Aug	WP/MP/S	42,000	Great butterfly plant, tolerant of drier soils.
Eurybia macrophylla	Big-leaved aster	UM, NE	1-5'	blue	Aug-Sept	WD/S	27,000	A large flowered aster.
Filipendula rubra	Queen of the prairie	UM	3-6'	pink	July-Aug	WP/MP	38,000	Flowers are reminscent of wands of cotton candy.
Fragaria virginiana	Wild strawberry	UM, NE	2" - 4"	white	April-June	S	83,000	Strawberries produced are smaller and sweeter than its garden cousins.
Galium boreale	Northern bedstraw	UM	12"- 2'	white	June-July	WD	70,000	
Gaura biennis	Biennual beeblossom	UM	3-6'	white/pink	July-Sept	DP/MP/S	2,700	Plant is coverd with a silvery fuzz and adorned with small interesting dusty pink flowers.
Gentiana alba	Cream gentian	UM	1-2'	cream	Aug-Sept	MP	140,000	Late summer bloomer with cream colored flowers.
Gentiana andrewsii	Bottle gentian	UM	1-3'	blue	Aug-Oct	WP/MP	280,000	A lovely late fall bloomer with a bright blue bottle-shaped flower, bumble bees wriggle into tight blooms, it's a show!
Gentiana puberulenta	Downy gentian	GP	1-3''	blue	Aug-Oct	DP/S	435,000	
Gentianopsis crinita	Fringed gentian	UM, NE	12"	blue	Aug-Oct	WP	200,000	
Geranium maculatum	Wild geranium	UM, GP, NE	1-2'	lavender	April-June	WD/S	5,000	A native shade garden standard that has crossed over into traditional gardening - a must-have species!
Geum aleppicum	Yellow avens	UM	2-5'	yellow	June-Aug	WP/S	20,000	
Geum rivale	Purple avens	UM	1-2'	pink	May-Aug	WD/WW		
Geum triflorum	Prairie smoke	UM	6"-12"	burgundy/pink	April-June	DP/MP	27,000	Pink to red buds explode into a smoky looking plume.
Glandularia canadensis	Rose verbena	GP	6-18"	purple-blue	Aug-Oct	DP/MP/S		
Hasteola suaveolens	Sweet Indian plantain	UM	3-5'	white	July-Sept	WD/S	14,000	A stately plant topped with cottony flowers
Helenium autumnale	Dogtooth daisy	UM, GP, NE	2-4'	yellow	Aug-Oct	WP/MP	130,000	A very attractive well shaped plant with abundant yellow flowers. Butterflies love it.

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Known as “Prairie Smoke” for its wisps flowing off the ripe seed that are so incredibly fine, they look like smoke, *Geum triflorum* has a deep burgundy/red/pink blossom that blooms from April to June. Happiest in Dry and Mesic Prairies, it grows 6 to 12 inches tall and adds a very unique accent to any planting or prairie.

FORBS

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Helianthus divaricatus	Woodland sunflower	UM, NE	2-6'	yellow	July-Oct	MP/WD/S	•	•				•		•	4,800	A great bird feeder, long blooming and hardy.
Helianthus giganteus	Tall sunflower	UM, NE	5-8'	yellow	July-Sept	WP/WD/WW/S							•		10,000	Monarch.
Helianthus grosseserratus	Saw-tooth sunflower	UM, GP	2-9'	yellow	Aug-Oct	WP/MP	•	•	•	•				•	15,000	Similar to *Helianthus divaricatus*, but taller and adapted to moist ground.
Helianthus hirsutus	Hairy sunflower	UM	1-4'	yellow	Aug-Sept	MP	•									One of the largest and brightest sunflowers. Provides a good food source for migrating birds.
Helianthus maximiliani	Maximilian's sunflower	UM, NE, GP	4-7'	yellow	Aug-Sept	DP/MP/S									13,000	Monarch.
Helianthus microcephalus	Small wood sunflower	UM	3-6'	yellow	July-Sept	MP/S	•						•			A great bird feeder, long blooming and hardy.
Helianthus mollis	Downy sunflower	UM, NE, GP	3-5'	yellow	Aug-Sept	DP/MP/S							•		7,000	
Helianthus occidentalis	Ox-eye sunflower	UM	2-3'	yellow	Aug-Sept	DP/MP	•							•	14,000	Also known as the "naked sunflower" because stems are free of leaves and very smooth.
Helianthus pauciflorus	Stiff sunflower	UM, GP	3-5'	yellow	July-Sept	DP	•								4,000	
Helianthus salicifolius	Willow leaved sunflower	GP	8-10'	yellow	Sept-Oct	MP	•		•					•		
Helianthus strumosus	Prairie sunflower	UM, GP	2-5'	yellow	July-Oct	MP/WD/S	•					•			4,200	A great bird feeder, long blooming and hardy.
Heliopsis helianthoides	False sunflower	UM	2-5'	yellow	July-Sept	DP/MP	•							•	6,300	Similar to the *Helianthus* species but not a true sunflower. Blooms most of the summer.
Hepatica acutiloba	Sharp lobed hepatica	UM	4"-9"	lavender	March-May	WD									8,600	One of the first blooms of spring, pretty blue to lavendar butter-cup-shaped flowers surrounded by larged heart-shaped leaves are a joy to woodland walkers.
Heracleum maximum	Cowbane	UM	3-10'	white	June	WP									2,600	Large stately plants appropriate in swales and basins.
Heuchera parviflora	Littleflower alum root	GP	1-3'	yellow	May-Aug	DP										Good rock garden plant.
Heuchera richardsonii	Alum root	UM	2-3'	white	May-July	DP/MP/S					•				700,000	Low growing, its pretty lobed leaves make great ground cover - flowers are unremarkable.
Hibiscus laevis	Halberd-leaf rose mallow	UM, GP	3-5'	pink	July-Sept	WP									2,800	
Hibiscus lasiocarpos	Rose mallow	UM, GP	3-5'	white	Apr-Sep	WP/WW	•		•						2,400	
Hypericum ascyron	Great St. John's wort	UM	2-5'	yellow	July-Aug	WP/MP	•	•	•	•				•	190,000	Similar to commonly cultivated St. John's worts, much larger flowers than most native species of this genus.
Hypericum prolificum	Shrubby St. John's wort	UM	1-4'	yellow	July-Sept	WP									5,300	Common to roadsides and pastures.
Hypericum sphaerocarpum	Roundseed St. John's wort	UM, GP	1-2'	yellow	June-Sept	DP/MP/S							•		34,000	
Hypoxis hirsuta	Yellow star grass	UM, GP	3"-7"	yellow	May-Aug	WD/S									80,000	Contrary to its name this species is not a grass and is closely related to the Iris, with bright yellow star-shaped flowers.
Ionactis linarifolius	Flax-leaved aster	UM	1-3'	white	June-Sept	DP	•						•		71,000	
Iris cristata	Crested iris	NE	8"	purple	May	WP/WW/S	•									
Iris fulva	Copper iris	GP	1-2'	red	June	WP/E										
Iris versicolor	Northern blue flag	UM, GP, NE	1-3'	purple and yellow	May-July	WP/MP/E	•		•	•				•	1,000	More simple and elegant than over-bred horticulture varieties. Like other irises it is poisonous.
Iris virginica shrevei	Blue flag iris	UM, GP	1-3'	purple and yellow	May-July	WP/MP/E	•	•	•	•			•	•	1,000	More simple and elegant than over-bred horticulture varieties. Like other irises it is poisonous.
Krigia biflora	Dwarf dandelion	UM, NE	6-18"	yellow	June-July	MP/WD/S									40,000	This dandelion is well-behaved because it belongs here, unlike the bemoaned and deseiged version from Europe.
Lespedeza capitata	Round-headed bush clover	UM, GP, NE	2-4'	ivory	July-Sept	DP/MP	•								8,000	A bird feeder and soil enricher.
Liatris aspera	Rough blazing star	UM, GP	2-3'	purple/pink	Aug-Oct	DP/MP	•		•						16,000	Already loved by traditional gardners everywhere and a great butterfly plant.
Liatris cylindracea	Cylindrical blazing star	UM	6"-20"	purple	July-Sept	DP	•			•			•	•	14,000	Great for rock gardens; prefers dry, poor soil and full sun.
Liatris liguilistyls	Spotted blazing star	UM	2-3'	purple/pink	Aug-Oct	DP/MP	•							•	10,000	Already loved by traditional gardners everywhere and a great butterfly plant.
Liatris punctata	Dotted blazing star	GP	2-3'	purple/pink	Aug-Oct	DP/MP	•						•	•	7,000	

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Dicentra cucullaria is known by the common name “Dutchman’s britches” (and related to the cultivar Bleeding hearts). The flowers of this native resemble rows of white and yellow “britches” hung out to dry. 5”-9” tall, *Dicentra* blooms from April to May, then almost disappears to save its energy. A woodland plant, *Dicentra* does well in partially shady areas, a boon to gardeners who have wooded lots.

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Botanical Name	Common Name	Region	Height	Color	Bloom	Habitat	Seeds/oz	Description
Liatris pycnostachya	Prairie blazing star	UM, GP	2-4'	purple	July-Sept	WP/MP	11,000	Similar to *Liatris aspera*, but more robust and showy. Tolerates heavier soils.
Liatris scariosa nieuwlandii	Eastern blazingstar	GP	1-2'	purple	Aug-Sept	DP/MP	7,000	
Liatris spicata	Marsh blazing star	UM, GP, NE	1-4'	pink	July-Sept	WP	11,000	Similar to *Liatris pycnostachya*. Tolerates saturated soils.
Lilium michiganense	Turk's cap lily	UM	3-6'	orange	July-Aug	WP	10,000	Large orange flowers, very similar to the cultilvar tiger lily. Some lump *L. superbum* and *L. Lilium michiganense* together, others insist they are distinct species.
Lilium philadelphicum								
Linum sulcatum	Grooved yellow flax	UM, GP	1-2'	yellow	July-Aug	DP	42,000	
Lobelia cardinalis	Cardinal flower	UM, GP, NE	2-4'	scarlet	July-Sept	WP/WW	400,000	A must have for hummingbird lovers! Vibrant scarlet flowers are a glorious addition to traditional or native landscaping – tolerates heavy soils and partial shade.
Lobelia siphilitica	Great blue lobelia	UM, GP, NE	1-4'	blue	Aug-Sept	WP/WW	500,000	Similar to *Lobelia cardinalis*, but lower growing with blue flowers.
Lobelia spicata	Spiked blue lobelia	UM, GP	8"-40"	lavender	June-Aug	MP	900,000	A small flowered *Lobelia*.
Ludwigia alternifolia	Seedbox	UM, NE, GP	2-3'	yellow	May-July	WP	1,300,000	
Lupinus perennis	Wild lupine	UM	1-2'	blue	May-June	DP/MP	990	Karner blue butterfly host plant, pretty blue to purple flowers, reminiscent of the blue bonnet.
Lycopus americanus	Water horehound	UM, GP, NE	1-2'	white	June-Sept	WP	130,000	A member of the mint family with toothed leaves. Commonly found along pond and stream edges.
Lycopus asper	Rough Bugleweed	UM, GP	2-3'	white	June-Sept	WP	15,000	
Lycopus uniflorus	Bugleweed	UM, NE	1-2'	white	June-Sept	WP		Green throughout the growing season, fresh minty scent. Flowers are inconspicuous.
Lysimachia ciliata	Fringed loosestrife	UM, NE	1-4'	yellow	June-Aug	WP/WW	39,000	
Lysimachia quadriflora	Narrow-leaved loosestrife	UM, NE	1-3'	yellow	July-Aug	WP/MP	90,000	
Lythrum alatum	Winged loosestrife	UM, GP, NE	1-2'	purple/pink	June-Sept	WP	3,000,000	A native alternative to Purple loosestrife, same bright color, but in a smaller package.
Maianthemum canadense	Canada mayflower	UM, NE	6"	white	April - May	WD	1,900	
Mentha arvensis	Wild mint	UM, GP, NE	6"-24"	white	July-Sept	WP	300,000	Green throughout the growing season, fresh minty scent. Flowers are inconspicuous.
Mertensia virginica	Virginia bluebell	UM	6"-24"	blue	April - May	WD	9,700	A profusion of blue bell-shaped flowers.
Mimulus ringens	Monkey flower	UM, GP, NE	1-4'	violet	June-Sept	WP	2,300,000	Blue-violet snap dragon-like flowers. Tolerates heavy soils.
Minuartia michauxii	Stiff sandwort	UM	8"	white	May-July	DP	3,840,000	
Monarda bradburiana	Bee balm, horsemint	GP	1-2'	pink	May-July	DP/MP	35,000	
Monarda citriodora								
Monarda fistulosa	Wild bergamot	UM, GP	2-4'	lavender/pink	July-Aug	WP/MP	70,000	A native landscaping staple. Tolerates a wide variety of conditions; lots of pretty lavender flowers, leaves make a great mint tea. It's also a butterfly favorite.
Monarda punctata	Horse mint	UM, NE	6"-24"	lavender	July-Sept	DP	90,000	Pink/lavender leaves mimic flowers while its true flowers are remarkable - low growing.
Napaea dioica	Glade mallow	UM	3-6'	white	June-Aug	MP/WD/S	5,300	
Nuphar advena	Yellow water lily	UM	floating	yellow	June-Aug	aquatic		Gorgeous large flowers.
Nymphaea odorata	White water lily	GP, NE	floating	white	June-Aug	aquatic		Gorgeous large flowers.
Nymphaea tuberosa	White water lily	UM	floating	white	June-Aug	aquatic		Gorgeous large flowers. It may become dominant.
Oenothera biennis	Common evening primrose	UM, GP	2-5'	yellow	July-Oct	DP/MP	90,000	Yellow flowers on a wand-like inflorescence.
Oenothera clelandii	Cleland's Evening Primrose	UM	1-2'	yellow	June-Sept	DP/S	100,000	
Oenothera macrocarpa	Bigfruit evening primrose	UM, GP	1-3'	yellow	May-July	DP	4,700	Threatened in some regions.
Oenothera pilosella	Meadow Evening Primrose	UM, NE	1-2'	yellow	May-June	WP/MP/WW/S	266,000	

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Most prairie restorations have *Monarda fistulosa* throughout. Also known as Wild bergmot, *Monarda* is a very hardy and, therefore, tolerant plant and thrives in many conditions. The lavender blooms are quite numerous, making it a great plant for color designing in a garden or prairie. Some people use the leaves to make a tasty mint tea, and the plant is a favorite of butterflies.

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Oenothera speciosa	Pink petticoats primrose	UM, GP	8"-24"	pink	May-June	DP	•									Large delicate pink flowers make this a native must-have.
Oligoneuron album	Stiff aster	UM	6"-24"	white	July-Sept	DP/MP	•						•		64,000	A flat-topped goldenrod that looks like an aster.
Oligoneuron riddellii	Riddell's goldenrod	UM	1-3'	yellow	Aug-Oct	WP	•	•		•					93,000	Riddell's goldenrod is a butterfly favorite and bird feeder.
Oligoneuron rigidum	Rigid goldenrod	UM, GP	1-4'	yellow	July-Oct	DP/MP	•		•	•				•	41,000	An attractive flat-topped goldenrod – a bird and butterfly favorite.
Opuntia humifusa	Eastern prickly pear	UM, GP	6"-12"	yellow	May-June	DP	•		•				•		1,400	Large yellow flowers and edible paddles, beware of deceptively harmless looking silky spines. They can be very difficult to pluck out of fingers!
Osmunda cinnamomea	Cinnamon fern	UM, NE	2-5'	green	May-July	WP/WW					•		•		spores	
Ozmorhiza claytonii	Sweet cicley	UM	3-6'	white	June-Sept	WP									2,500	
Packera obovata	Squaw weed	UM	1-2'	yellow	Apr-June	WP/WW										
Packera paupercula	Ragwort	UM, NE	4"-18"	yellow	May-Aug	DP/WP/MP					•		•			A low-growing plant with an umbrella-like cluster of golden flowers.
Packera plattensis	Ragwort	GP	1-2'	yellow	May-June	DP/WD/S									100,000	
Parthenium integrifolium	Wild quinine	UM, GP	2-3'	white	June-Sept	MP							•	•	7,000	A lovely addition to your native landscape with large, white long-lasting inflorescence.
Pedicularis lanceolata	Swamp betony	UM	1-2'	yellow	Aug-Oct	WP		•					•		44,000	
Peltandra virginica	Arrow arum	UM, NE	2-3'	green, black	Apr-June	E										
Penstemon calycosus	Smooth beard tongue	UM	1-4'	white	May-July	MP/S	•	•					•	•	90,000	Long lasting bloomer, tolerates shade.
Penstemon cobaea	Showy beard tongue	UM, GP	1-3'	pink, lavender or white	May-June	DP									12,000	
Penstemon digitalis	Foxglove beard tongue	UM, GP, NE	1-4'	white	May-July	DP/MP	•	•	•					•	130,000	Long lasting bloomer, frequently used in traditional landscaping.
Penstemon grandiflorus	Large flowered beard tongue	UM	2-4'	lavender	June-Aug	DP/MP	•						•	•	14,000	This spectacular plant has blue-green waxy leaves and large tubular flowers. Hummingbird attractor.
Penstemon hirsutus	Hairy beard tongue	UM	1-3'	violet	June-July	DP/S	•						•	•	330,000	
Penstemon tubaeflorus	Western beard tongue	UM, GP	1-3'	white	May-June	DP/MP/S	•								80,000	
Penthorum sedoides	Ditch stonecrop	UM, GP, NE	1-3'	green	June-Sept	WP									1,300,000	This plant has an interesting starfish-shaped form inflorescence.
Phemeranthus calycium																
Phlox divaricata	Woodland phlox	UM	6"-12"	blue	April-June	DP/MP	•						•		12,500	Tolerates full sun to moderate shade.
Phlox glaberrima interior	Marsh phlox	UM	6"-18"	fuchsia	April-June	WP/MP		•					•	•	7,200	Topped with vibrant hued flowers.
Phlox maculata	Spotted phlox	UM	2-4'	fuchsia	May-July	WP/WW							•		11,000	
Phlox pilosa	Downy prairie phlox	UM, GP, NE	6"-18"	pink	April-June	DP/MP/S	•						•	•	19,000	Similar to *Phlox divaricata*, but more sun tolerant and prefers drier soils. Downy prairie phlox is a butterfly favorite.
Phyrma leptastachya	Lopseed	UM	1-3'	lavender	July-Sept	WD/S									4,000	
Physostegia virginiana	Obedient plant	UM, GP, NE	1-4'	pink/lavender	June-Sept	WP/MP		•		•				•	11,000	Showy snapdragon-like flowers make this a nice addition to any rain garden.
Phytolacca americana	Pokeweed	UM	4-10'	white/purple	May-Sept	DP/MP										
Podophyllum peltatum	Mayapple	UM, NE	12"-18"	white	April-June	WD/S									903	Large white flowers dangle under a canopy of large leaves.
Polemonium reptans	Jacob's ladder	UM, GP, NE	6"-12"	blue	April-June	WD/S					•		•		18,000	Low growing spring bloomer, which tolerates a variety of conditions. The interesting leaf pattern is attractive the entire growing season.
Polygonum sagittatum	Lady's tear thumb	UM	2-6'	pink/white	June-Oct	WP/WW			•							Leaves are edged with barbs.
Polygonatum biflorum	Smooth Solomon's seal	UM, NE	1-3'	white/yellow	May-June	WD/S		•	•						800	A beautiful, arching plant with bell-shaped flowers.
Polygonatum canaliculatum	Great Solomon's seal	UM	2-5'	white	May-June	MP/WD/S		•			•				800	Gracefully arching plants. - remove
Polygonum hydropiperoides	Mild water pepper	UM	1-3'	white/green	June-Nov	WP							•		9,000	Leaves have a peppery tang when chewed.
Polygonum lapathifolium	Heart cease	UM	1-6'	pink/white/green	July-Nov	WP/MP			•							
Polygonum pensylvanicum	Pennsylvania knotweed	UM	6"-12"	pink	June-Oct	WP									13,000	
Pontederia cordata	Pickeral weed	UM, GP, NE	1-4'	blue/purple	June-Oct	WP/E			•						312	Stems of purple-blue flowers are a real eye-catcher in wetlands.

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You can't go wrong with the classics, and *Rudbeckia hirta*, or the Black-eyed Susan, is a staple of the prairie. While it is only a biennial, it acts like a perennial, reseeding itself and providing continuous generations for your viewing pleasure. Bright yellow flowers show themselves in early June, and last through August.

Botanical Name	Common Name	Region	Height	Color	Bloom	Habitat									Seeds/oz	Description
Potentilla arguta	Prairie cinquefoil	UM	1-2'	yellow	June-July	DP			•					•	230,000	An attractive low growing plant with butter yellow flowers appropriate in dry to moderate soil types.
Pulstatilla patens	Pasque flower	UM	2"-14"	lavender	March-May	DP/MP	•								18,000	Also known as "harbinger of spring," Pasque flower is one of the first to blossom in the spring. Its large crocus shaped blooms are spectacular. Sap from plant my irritate skin and eyes.
Pycnanthemum tenuifolium	Slender mountain mint	UM, GP, NE	1-3'	white	June-July	WP/MP/WW			•						378,000	
Pycnanthemum virginianum	Mountain mint	UM, GP, NE	1-4'	white	July-Sept	WP/MP		•	•	•		•		•	220,000	Our favorite mint! A fresh smelling plant with attractive, frilly, white flowers.
Ratibida columnifera	Upright coneflower	UM, GP, NE	2-3'	yellow	June-Aug	DP/MP	•							•	42,000	
Ratibida pinnata	Yellow or Grey headed cone-flower	UM, GP, NE	1-4'	yellow and brown	June-Aug	DP/WP/MP	•	•		•				•	30,000	A native landscaping must have. Tolerates partial shade to full sun and dry to moderately wet soils.
Rorippa islandica	Yellow cress	UM	6"-24"	yellow	May-Sept	WP										
Rudbeckia fulgida sullivantii	Showy coneflower	GP, NE	1-3'	yellow	June-Aug	DP/WP/MP	•								31,000	
Rudbeckia fulgida umbrosia	Orange coneflower	GP, NE	1-3'	yellow and brown	July-Sept	DP/WP/MP	•								31,000	
Rudbeckia hirta	Black-eyed Susan	UM, GP, NE	1-3'	yellow and brown	June-Aug	DP/MP	•		•	•				•	92,000	Another must-have native landscaping plant – biennial, but reseeds itself readily.
Rudbeckia laciniata	Wild golden glow	UM, GP, NE	3-12'	yellow	July-Sept	WP/MP/S	•	•				•			14,000	Also known as green-headed coneflower. A stately plant with large yellow cone-shaped flowers.
Rudbeckia subtomentosa	Sweet black-eyed Susan	UM, GP	2-4'	yellow	July-Oct	WP/MP	•	•		•			•	•	43,000	Similar to Black-eyed Susan, but perennial and longer flowering. It has smaller more abundant flowers and tolerates heavy soil.
Rudbeckia triloba	Brown-eyed Susan	UM, NE	1-4'	yellow and brown	July-Oct	WD/S	•							•	34,000	Perennial and long flowering, with small abundant flowers, adapted to partial shade.
Ruellia humilis	Wild petunia	UM	6"-18"	purple	June-Aug	DP/MP	•						•		5,200	Classic petunia form.
Rumex orbiculatus	Great water dock	UM, GP	2-5'	green/brown	May-July	WP		•							11,900	
Rumex verticillatus	Swamp dock	UM	2-5'	green	May-July	WP									24,000	
Sagittaria latifolia	Arrowhead (Duck potato)	UM, GP	1-2'	white	July-Oct	WP/E				•					61,000	Large arrowhead-shaped leaves add variety to any rain garden. Potato-like tubers were a major food source for early settlers.
Salvia azurea	Blue sage	GP, UM	2-5'	blue	Aug-Sept	DP/MP	•								7,000	
Sanguanaria canadensis	Bloodroot	UM, NE	6"-12"	white	March-May	WD					•				1,700	Wonderful early bloomer with large, crocus-like flowers. Roots produce a blood red sap that was used as dye by the Native Americans and early settlers.
Sanicula marilandica	Black snakeroot	UM, NE	1-4'	white	May-July	WD										
Saururus cernuus	Lizard's tail	GP	1-3'	white	May-Aug	E/WW	•	•	•							
Scrophularia marilandica	Late figwort	UM	3-8'	green	July-Oct	WD/S									170,000	
Senna hebecarpa	Wild senna	UM, NE	3-6'	yellow	July-Aug	WP/MP	•						•		1,800	Similar to *Chamaecrista fasciculata*.
Silene regia	Royal catchfly	UM	2-4'	red	July-Aug	DP/MP	•						•		23,000	Catchfly is eye-catching red, and sticky to small insects.
Silene stellata	Starry campion	UM, GP	1-2'	white	July-Aug	DP/MP									30,000	Delicate white flowers about 1/2" wide cover this classically shaped plant.
Silphium integrifolium	Rosin weed	UM, GP	2-6'	yellow	July-Sept	MP	•		•					•	1,200	Rosin weed is a great bird feeder.
Silphium laciniatum	Compass plant	UM, GP	3-7'	yellow	June-Sept	DP/MP	•		•	•		•		•	660	Referred to as compass plant because leaves align themselves north and south to reduce water loss in high summer.
Silphium perfoliatum	Cup plant	UM, GP	3-7'	yellow	July-Sept	WP	•	•	•					•	1,400	An important butterfly and hummingbird plant; leaves form cups that hold water for sipping.
Silphium terebinthinaceum	Prairie dock	UM	3-8'	yellow	July-Sept	DP/MP	•		•	•				•	1,000	Also known as "Elephant ears" because of its huge basal leaves.
Sisyrinchium campestre	Blue-eyed grass	UM, GP	4"-12"	blue	May-July	DP/MP									45,000	A great rock garden plant with delicate blue flowers, related to the irises.
Sium suave	Water-parsnip	UM, NE	3-4'	white	June-Sept	WP	•								50,000	

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The "wort" in Spiderwort (*Tradescantia ohiensis*) is old English for "Plant," "Root" or "Herb." "Spider" refers to the leaves that tend to be rolled up and look like a spider's legs. *Tradescantia* produces lots of stunning flowers that range from dark-blue to lavender (sometimes within the same day) with bright yellow anthers, and is one of the earliest summer bloomers. It will make your heart sing when it appears in the late spring.

Botanical Name	Common Name	Region	Height	Color	Bloom	Habitat									Seeds/oz	Description
Smilacina racemosa	Feathery false Solomon's seal	UM	1-3'	green	May-July	WD/S									400	Graceful arching plants topped with white flowers.
Smilax herbacea	Carrion flower	UM	1-3'	green	May-June	WD/S									768	Smelly flowers attract pollinators.
Solidago caesia	Blue-stemmed goldenrod	GP	1-3'	yellow	Aug-Oct	WD/S	•								112,000	
Solidago canadensis	Canada goldenrod	GP, NE	3-6'	yellow	Sep-Oct	DP/MP									287,500	Drought resistant, may become aggressive.
Solidago drummondii	Cliff goldenrod	GP	2-3'	yellow	Sep-Oct	DP/MP	•								80,000	
Solidago flexicaulis	Zig-zag goldenrod	UM	1-3'	yellow	Sept-Oct	WD/WW	•								84,000	
Solidago gigantea	Giant goldenrod	UM, GP	2-7'	yellow	Aug-Oct	WP/MP									250,000	
Solidago missouriensis	Missouri goldenrod	GP	1-2'	yellow	July-Sept	MP	•								197,000	
Solidago nemoralis	Old field goldenrod	UM, NE	6"-20"	yellow	Aug-Oct	DP	•							•	300,000	A well-behaved low growing goldenrod with the classic wand shape. Adapted to well drained soils.
Solidago rugosa	Wrinkle leaf goldenrod	GP, UM	2-5'	yellow	Sep	WD/S	•									
Solidago speciosa	Showy goldenrod	UM	1-3'	yellow	Aug-Oct	DP/MP	•	•						•	95,000	A popular goldenrod, it is a bird and butterfly favorite.
Solidago ulmifolia	Elm-leaved goldenrod	UM	1-4'	yellow	Aug-Oct	MP/S	•								130,000	A great shade-tolerant goldenrod.
Specularia perfoliata	Venus' looking glass	UM	6"-30"	violet	May-Aug	DP/MP									3,000,000	A small annual with blue-purple flowers in each leaf axis.
Spigelia marilandica	Indian pink	GP	1-2'	red/yellow	May	WD/S										
Symplocarpus foetidus																
Stylophorum diphyllum	Celadine poppy	NE	12"	yellow	April-May	DP/WP/MP	•								13,000	
Symphyotrichum cordifolium	Heart-leaved wood blue aster	UM, NE	1-4'	violet	Aug-Oct	S	•								140,000	Produces a mass of blue-violet flowers with yellow centers.
Symphyotrichum ericoides	Heath aster	UM, GP, NE	1-3'	white	Aug-Oct	DP	•			•		•		•	200,000	A great low growing aster producing a profuse bank of small flowers that attract butterflies.
Symphyotrichum laeve	Smooth aster	UM, GP, NE	1-4'	blue	Aug-Oct	DP/MP/S	•			•				•	55,000	Pretty blue flowers and blue-green foliage, this plant does well in full sun or partial shade.
Symphyotrichum lanceolatum	Panicled aster	UM, GP	1-2'	white	July-Oct	WP	•	•		•					43,750	Hardy and tolerant of wet clay soils.
Symphyotrichum lateriflorum	Side flowering aster	UM	1-4'	lavender	Aug-Oct	WP/MP/WD/S	•								250,000	Great late color with a profusion of lavender blossoms.
Symphyotrichum novae-angliae	New England aster	UM, GP, NE	1-4'	purple	Aug-Oct	WP/MP	•	•		•				•	66,000	A spectacular bloomer with large many petaled purple flowers. This plant is usually loaded with butterflies.
Symphyotrichum oblongifolium	Aromatic aster	UM, GP	2'	purple	Aug-Oct	DP									51,000	
Symphyotrichum oolentangiense	Sky-blue aster	UM, GP	6"-24"	azure	Aug-Oct	DP/MP	•			•				•	80,000	Its bright blue blossoms attract butterflies.
Symphyotrichum pilosum	Hairy aster	UM, GP	2-4'	white	Sept-Oct	DP/WP/MP	•								140,000	A hardy adaptable aster.
Symphyotrichum puniceum	Swamp aster	UM, GP	1-5'	white	Aug-Oct	WP	•	•		•		•			80,000	Hardy and tolerant of clay soils.
Symphyotrichum sericeum	Silky aster	UM, NE	1-2'	lavender	Aug-Oct	DP/MP	•					•			56,000	A lovely low-growing plant with silky silver-green foliage and pretty lavender blossoms. It's also a bird and butterfly feeder.
Symphyotrichum shortii	Short's aster	UM	2-4'	blue	Aug-Oct	WD/S	•					•			60,000	Similar to *Aster laevis*.
Symphyotricum urophyllum	Arrow-leaved aster	UM	2-4'	blue	Aug-Oct	WD/S	•								135,000	A shade loving aster similar to Aster laevis, but with arrow-shaped leaves.
Talinum calycinum	Rock pink	UM, GP	6"	pink	June-Aug	DP									66,600	
Tephrosia virginiana	Goat's rue	UM,GP	12"	pink/yellow	June-July	DP									2,500	
Teucrium canadense	Germander	UM, GP	8"-36"	pink	July-Aug	DP/WP/MP			•	•					20,000	An attractive shade tolerant plant with a fresh scent.
Thalictrum dasycarpum	Meadow rue	UM	3-5'	cream	June-July	WP/MP/S		•			•				11,000	This hardy perennial has delicate white flowers, purple stems and blue-green foliage.
Thalictrum diocum	Early meadow rue	UM, GP	1-2'	white	April-May	WD									7,300	

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Bird, butterfly or bee attractor
Rain garden/swale
Deer-resistant
Salt-tolerant
Walnut-compatable
Erosion control
Protected in some areas
Makes a good cut flower

The "wort" in Spiderwort (*Tradescantia ohiensis*) is old English for "Plant," "Root" or "Herb." "Spider" refers to the leaves that tend to be rolled up and look like a spider's legs. *Tradescantia* produces lots of stunning flowers that range from dark-blue to lavender (sometimes within the same day) with bright yellow anthers, and is one of the earliest summer bloomers. It will make your heart sing when it appears in the late spring.

REPLACE

Botanical Name	Common Name	Region	Height	Color	Bloom	Habitat									Seeds/oz	Description
Thalictrum revolutum	Way meadow rue	UM, NE	1-2'	white	April-May	WD						•				
Thelypteris palustris	Marsh fern	UM	2-3'	green	May-July	WW									spores	
Tradescantia bracteata	Prairie spiderwort	UM	1-3'	pink / white	June-Sept	DP/S				•		•			10,000	
Tradescantia occidentalis	Western spiderwort	UM	1-4'	lavender	April-July	WP/MP/S				•	•				9,000	Blooms during morning hours, flowers close up on hot sunny days.
Tradescantia ohiensis	Spiderwort	UM, GP, NE	1-4'	blue	April-July	WP/MP/S				•	•	•			8,000	Blooms during morning hours, flowers close up on hot sunny days. Also known as "cow slobbers" because of its thick slimy sap.
Trientalis borealis	Star-flower	NE	6"	white	May	WD						•				
Uvularia sessilifolia	Bellwort	UM, NE	6-12"	yellow	May-June	WD					•					A gracefully arching plant with dangling bell-shaped flowers.
Verbena hastata	Blue vervain	UM, GP, NE	2-4'	purple	July-Oct	WP	•	•		•				•	93,000	Plant sports spikes of blue flowers and tolerates a variety of soil conditions.
Verbena stricta	Hoary vervain	UM, GP	1-2'	blue/purple	July-Sept	DP/MP	•							•	28,000	Similar to *Verbena hastata*, adapted to well drained soils.
Verbena urticifolia	White vervain	GP	3-5'	white	July-Oct	WP/MP/WW	•								47,000	
Verbesina alternifolia	Wingstem	UM, GP	3-8'	yellow	Aug-Sept	WP/WW/S						•			9,000	This plant has small daisy-like flowers; its name appropriately describes its winged stems.
Vernonia arkansasna	Curlytop ironweed	GP	4-6'	pink-purple	Aug-Sept	WP/MP		•	•							
Vernonia baldwinii	Inland ironweed	UM, GP	2-5'	purple	May-Sept	DP/MP	•								24,000	
Vernonia fasciculata	Common ironweed	UM	3-5'	royal purple	July-Sept	WP	•	•		•				•	24,000	Plants are topped with gorgeous royal purple blooms.
Veronicastrum virginiana	Culver's root	UM, GP, NE	3-5'	white	July-Aug	WP/MP/S	•	•						•	800,000	A native landscaping must-have with frothy spikes of white flowers.
Viola pedata	Bird's foot violet	UM, GP, NE	2-6"	purple	April-June	DP/MP/S	•								26,000	
Viola pedatifida	Prairie violet	UM	2"-6"	lavender	April-June	DP/MP/S	•					•			28,000	
Viola pubescens	Downy yellow violet	UM	6"-16"	yellow	April-May	WD/S	•				•				8,500	
Zizia aptera	Heart-leaved golden alexanders	UM, GP, NE	1-2'	yellow	May-June	DP/MP	•					•			12,000	This swallowtail host plant is an important early bloomer. Sap from plants has been known to cause skin irritation.
Zizia aurea	Golden alexanders	UM, GP, NE	1-2'	yellow	May-June	WP/MP	•	•		•					11,000	A swallowtail host plant adapted to poorly drained soils. Sap from plants has been known to cause skin irritation.

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Bird, butterfly or bee attractor
Rain garden/swale
Deer-resistant
Salt-tolerant
Walnut-compatable
Erosion control
Protected in some areas
Makes a good cut flower

The "wort" in Spiderwort (*Tradescantia ohiensis*) is old English for "Plant," "Root" or "Herb." "Spider" refers to the leaves that tend to be rolled up and look like a spider's legs. Tradescantia produces lots of stunning flowers that range from dark-blue to lavender (sometimes within the same day) with bright yellow anthers, and is one of the earliest summer bloomers. It will make your heart sing when it appears in the late spring.

REPLACE

GRASSES, SEDGES & RUSHES

Carex annectens (Large yellow fox sedge)

Height: 1'-4' Color: green Bloom: May-June Habitat: Wet to Mesic Prairie

A mid- to early-succession species, the *Carex annectens* is a Skipper Butterfly host plant, and excellent for use in rain gardens, basins, wwales, and other areas prone to periodic inundation and dryness. Its natural habitats are prairie depressions and old fields. This species prefers full-sun, but will tolerate partial shade. Plugs form a dense tuft and provide excellent cover.

Botanical Name	Common Name	Region	Height	Color	Bloom	Habitat	Seeds/oz	Description
Alopecurus aequalis	Short-awned foxtail	UM	8"- 24"	green	June-Sept	WP	91,500	
Andropogon gerardil	Big bluestem	UM, GP, NE	4-7'	purple and green	Aug-Nov	WP/MP	8,200	Attractive red stems - even in the winter, makes a nice touch for landscaping in areas where height is not a problem. Tolerates a variety of soil conditions and is also a bird feeder.
Andropogon virginicus	Broom sedge bluestem	NE	3-6'	purple and green	Sep-Nov	WP/MP		
Bouteloua curtipendula	Sideoats grama	UM, GP	1-3'	purple and gold	Aug-Oct	MP/DP	8,000	Sideoats grama is a bird feeder.
Bouteloua dactyloides	Buffalo grass	GP	5"	green	May-Sept	MP/DP	3,600	
Bouteloua gracilis	Blue grama grass	GP	12"	blue	July-Sept	DP	40,000	
Bouteloua hirsuta	Hairy grama	UM	1-2"	green and gold	June-Nov	DP	61,000	
Bromus ciliatus	Fringed brome	UM	2-3'	green and gold	May-July	WP/MP	17,700	
Bromus kalmii	Prairie brome	UM	1-3'	green and gold	May-July	MP/S	8,000	
Bromus pubescens	Woodland brome	UM, GP	1-3'	green and gold	May-July	MP/DP/S	7,100	
Calamagrostis canadensis	Blue joint grass	UM, GP, NE	2-5'	green	May-July	WP/W	95,000	A long-lived cool-season grass that can be found throughout North America. A favorite of the American bison.
Carex albicans	Whitetinge/Cedar sedge	GP	1-2'	green	May-July	DP/WD		
Carex annectens	Large yellow fox sedge	UM, GP	1-4'	green	May-July	WP	113,000	
Carex aquatilis	Long-bracted tussock sedge	UM	2-3'	green	May-June	E/WP	71,000	
Carex bebbii	Bebb's oval sedge	UM	1-3'	green	June-Aug	WP/WW	110,000	Each plug will form a dense tuft that will add variety to any perennial bed.
Carex bicknellii	Copper-shouldered oval sedge	UM	1-3'	green	June-Aug	DP/MP	23,600	Each plug will form a dense tuft that will add variety to any perennial bed.
Carex blanda	Eastern woodland sedge	UM, GP, NE	1-2'	green	May-June	WP/MP/WW/WD	12,500	
Carex brevior	Fescue sedge	GP	12"	green	June-July	WP/MP/WW/WD	29,000	
Carex bushii	Long-scaled green sedge	UM, GP	1-2'	green	April-July	WP/MP/WW		
Carex comosa	Bristly sedge	UM, GP	1-3'	yellowish-green	May-July	WP/W	141,000	Drooping seed heads that resemble a "bottle brush."
Carex crinita	Fringed sedge	UM	3-4'	green	May-July	WP	142,000	
Carex cristatella	Crested oval sedge	UM, GP	1-3'	green	June-Aug	WP/WW	59,000	Another species for wet sites. Produces round-spiked seed heads.
Carex eburnea	Cedar sedge	GP	6"	green	May-June	DP	61,000	
Carex frankii	Bristly cattail sedge	UM, GP	1-2'	green	May-Sept	WP/WW	17,000	

* New botanical names continue to be announced. A list of botanical aliases can be found at the end of the names listed here and are current per USDA National Plants Database at the time of printing.

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Bird, butterfly or bee attractor
Rain garden/swale
Deer-resistant
Salt-tolerant
Walnut-compatable
Erosion control
Protected in some areas
Makes a good cut flower

Botanical Name	Common Name	Region	Height	Color	Bloom	Habitat	Bird, butterfly or bee attractor	Rain garden/swale	Deer-resistant	Salt-tolerant	Walnut-compatable	Erosion control	Protected in some areas	Makes a good cut flower	Seeds/oz	Description
Carex gracillima	Purple-sheathed graceful sedge	UM, NE	3"-12"	dark green/ purple	May-July	WW									102,000	
Carex grayii	Common bur sedge	UM	1-3'	green	June-Sept	WW	•								1,200	Seed heads look like spiked clubs. Leaves retain dark green color until late in the year.
Carex haydenii	Hayden's sedge	UM	2-4'	green	May-July	WP									38,000	Very similar to *C. stricta*.
Carex hirsutella	Hairy green sedge	UM,GP, NE	2-3'	green	May-June	DP/MP/S									18,000	
Carex hyalinolepis	Shoreline sedge	UM, GP, NE	2-4'	green	May-July	WW/WP							•			
Carex hystericina	Porcupine sedge	UM, NE	1-2'	green	May-July	W/WP	•	•							30,000	Adds early season form and texture to your garden.
Carex lacustris	Common lake sedge	UM	2-3'	green	May-July	W/WP						•			40,500	
Carex lupulina	Common hop sedge	UM, NE	1-3'	green	May-July	WW/WP	•	•	•						3,600	Beautiful large seed heads add interest and shape to your garden.
Carex meadii	Mead's stiff sedge	UM, NE	8"	green	May-July	DP/MP/S									7,000	
Carex molesta	Field oval sedge	UM, GP	2-3'	green	May-July	WP/MP/WW									25,000	
Carex muskingumensis	Palm sedge	UM, GP	2-3'	green	July	DP/MP/WP/ WD/S									7,500	
Carex normalis	Spreading oval sedge	UM, NE	3-5'	green	June-Aug	MP/S/WD									25,000	
Carex pellita	Wooly sedge	GP	2-3'	green	June	WP									28,000	
Carex pensylvanica	Common oak sedge	UM, NE	3"-14"	green	April-May	S/DP/MP									47,000	
Carex prairiea	Fen panicled sedge	UM	1-3'	green	April-May	WP									84,000	
Carex rosea	Curly-styled wood sedge	UM, GP	3"-14"	green	April-May	S/DP/MP									21,800	
Carex scoparia	Lance-fruited oval sedge	UM, GP, NE	1-4'	green	June-Aug	WP	•	•		•					83,000	Great for filling out a spring garden.
Carex shortiana	Short's sedge	GP	2'	green/brown	May-July	WP/MP/WW									17,000	
Carex Sprengelii	Long-beaked sedge	UM	1-2'	green	May-July	WW/WD/S/MP	•								10,000	Will adapt to most site conditions.
Carex stipata	Common fox sedge	UM	1-3'	green	May-July	WP	•	•	•	•					35,400	Fast growing, clump forming species.
Carex stricta	Common tussock sedge	UM, GP, NE	1-4'	green	May-July	WP	•								188,000	One of the most common species of sedge in North America.
Carex texensis	Texas sedge	GP	10-12"	green	Mar-May	S/WW										
Carex trichocarpa	Hairy-fruited lake sedge	UM	2-3'	green	May-July	WP		•	•			•			24,000	Most often does not produce viable seed and is best started by vegetative methods.
Carex typhina	Common cattail sedge	UM	1-2'	green	May-July	WW/WP	•						•		15,000	
Carex vulpinoidea	Brown fox sedge	UM, GP, NE	1-3'	green	May-July	WP/MP	•	•	•	•					142,000	A sedge with large green amaranth-like inflorescence and seed heads.
Chasmanthium latifolium	River oats	UM, GP, NE	1-3'	green/brown	July-Sept	WP/MP						•				
Cinna arundinacea	Common wood reed	UM, GP, NE	2-5'	pale green	July-Oct	WD/WW									56,700	
Danthonia compressa	Flattened oatgrass	UM, NE	6-18'	green	June-Aug	S/WD										
Deschampsia cespitosa	Tufted hair grass	UM	2-3'	green and gold	July-Sept	WP/MP							•		156,000	Tolerates acidic soils.
Diarrhena obovata	Obvate beakgrass	UM, GP, NE	2'	green	July-Sept	DP/MP/WP/ WD/S									2,500	
Diachanthelium acuminatum	Old-field panic grass	UM	2'	green	July-Sept	DP/MP/S									22,000	
Dichanthelium leibergii	Prairie panic grass	UM	4"-18"	green	June-July	MP/DP							•		12,800	
Dichanthelium sphaerocarpon	Roundseed panicum	UM	8"-20"	green	May-June	DP/MP										
Eleocharis acicularis	Needle spike rush	UM, GP, NE	1"-12"	green	May-June	WP									70,000	
Eleocharis erythropoda	Red-rooted spike rush	UM, NE	1-2'	green	June-Aug	WP				•						

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Makes a good cut flower

Big Bluestem (*Andropogon gerardi*) is named for the bluish tinge the stems take on, and for its height, often reaching 7' or more. It is said to have grown so tall on the American Prairies that a man on horseback could be completely hidden by it. It is one of the classic grasses that make up a tallgrass prairie. If 7' is too much for your garden, look at Little Bluestem (*Schizachyrium scoparium*).

GRASSES, SEDGES & RUSHES

Botanical Name	Common Name	Region	Height	Color	Bloom	Habitat									Seeds/oz	Description
Eleocharis obtusa	Blunt spike rush	UM, GP	2"-8"	green	May-July	W/WP				•			•		100,000	
Eleocharis palustris	Great spike rush	GP, NE	2"-8"	green	May-July	W/WP				•					100,000	
Elymus canadensis	Canada wild rye	UM, GP, NE	2-5'	gold	May-July	MP/WP	•			•					4,200	Graceful nodding heads add shape and texture to even traditional flowerbeds.
Elymus hystrix	Bottlebrush grass	UM	2-3'	green	June-July	WD/S	•		•						5,000	Bright green foliage and brush-like seed heads.
Elymus macgregorii	Macgregor's wild rye	UM, GP	2-5'	gold	May-June	MP/WD										
Elymus riparius	Riverbank wild rye	UM, NE	2-5'	gold	May-July	W/WP/WD									4,000	
Elymus villosus	Silky wild rye	UM, GP, NE	2-5'	gold	May-July	W/WP/WD	•	•							9,800	
Elymus virginicus	Virginia wild rye	UM, GP, NE	2-5'	gold	May-July	WD/S/WW	•	•							4,600	Plant is entirely golden at harvest, lovely fall and winter interest.
Equisetum hyemale	Scouring rush/horsetail	UM, GP, NE	3-5'	green	June-Aug	WW/E			•	•					spores	
Eragrostis spectabilis	Purple love grass	UM,GP	6"-12"	pink, purple and green	May-July	MP/DP/S									280,000	Excellent groundcover, airy colorful grass that adds texture and interest to the landscape.
Eragrostis trichoides	Sand love grass	GP	1-3'	green	July-Oct	DP									90,000	
Festuca obtusa	Nodding fescue	UM	1-3'	deep green	June-July	S/WD										
Glyceria canadensis	Rattlesnake grass	UM	2-3'	green	July-Aug	WP									74,000	
Glyceria grandis	Reed manna grass	UM, NE	3-5'	green/purple	July-Aug	WP									80,000	
Glyceria septentrionalis	Floating manna grass	UM, NE	1-5'	green	July-Aug	E/WP										
Glyceria striata	Fowl manna grass	UM, GP, NE	1-5'	green/purple	July-Aug	WP	•	•							113,400	
Hierochloe odorata	Vanilla grass	UM, NE	1-2'	green	May-July	MP/WP				•			•		51,000	Fragrant foliage, sometimes burned for its aroma.
Juncus acuminatus	Sharp-fruited rush	UM, GP, NE	6"-24"	green	June-July	MP/WP										
Juncus dudleyi	Dudley's rush	UM, GP	6"-24"	green	June-July	WP		•	•							Moisture loving perennial with round stem.
Juncus effusus	Common rush	UM, GP, NE	6"-24"	green	June-July	WP		•	•	•					1,000,000	Green inflorescence emerges from the side of the stem.
Juncus interior	Inland rush	UM, GP	2-3'	green	May-Aug	WP									2,800,000	
Juncus tenuis	Path rush	UM, NE	1-1.5'	green	May-Sept	WP			•	•					113,000	
Juncus torreyi	Torrey's rush	UM, GP, NE	6"-24"	green	June-July	WP		•	•	•			•		1,220,000	Produces dense spherical inflorescence.
Koeleria macrantha	June grass	UM, GP	1-2'	gold	June-July	MP/DP	•			•					187,000	This short grass prefers dry soil conditions.
Leersia oryzoides	Rice cutgrass	UM, GP, NE	2-3'	green	Aug-Oct	W/WP			•	•					94,500	
Luzula multiflora	Wood reed	UM, NE	6"-12"	purple/green	May-July	S/MP										A gorgeous low growing grass. Blades are angular, burgundy and green in color and covered in long silky hairs.
Muhlenbergia mexicana	Leafy satin grass	UM	12"-30"	green	Aug-Oct	DP/MP									142,000	
Panicum virgatum	Switch grass	UM, GP, NE	3-5'	gold	Aug-Oct	MP/DP	•			•					18,000	A great wildlife feeder. Airy looking head makes a great filler.
Pascopyrum smithii	Western wheatgrass	GP	15-30"	yellowish-green	May-June	MP/WP					•					
Poa palustris	Marsh blue grass	UM, NE	2-5'	green	June-Sept	WP/MP									130,000	
Schizachyrium scoparium	Little bluestem	UM, GP, NE	1-3'	rust and green	Aug-Oct	MP/DP	•	•		•					9,000	If you plan to use any native grasses in your landscaping this should be the one - beautiful copper color stems look great year round, relatively low growing clump former, also a bird feeder.
Scirpus atrovirens	Dark green rush	UM, GP, NE	3-5'	green	May-July	W/WP		•		•					284,000	Dark-green leaves will add contrast to any rain garden. Waterfowl attractor.
Scirpus cyperinus	Wool grass	UM, NE	3-5'	green/rust	May-July	W/WP		•	•	•					1,500,000	
Scirpus pendulus	Drooping bulrush	UM, GP	1-4'	green/red	June-Sept	W/WP									300,000	

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Canadian Wild Rye (*Elymus canadensis*) is the perfect native cover crop, a cool season grass adaptable to a variety if conditions from dry to wet, full sun to partial shade. As an early succession species, *Elymus* is a short-lived perennial that sprouts quickly in new restorations and gives way to other species in a few seasons. It tends to stay as a small part of the overall species matrix and in disturbed areas.

GRASSES, SEDGES & RUSHES

Botanical Name	Common Name	Region	Height	Color	Bloom	Habitat	Seeds/oz	Description
Schoenoplectus acutus	Hard stem bulrush	UM, GP, NE	3-9'	green	May-July	WP/W	18,300	
Schoenoplectus fluviatilis	River bulrush	UM, GP	3-5'	green	May-July	W/WP	5,000	Sturdy triangular stems and flat broad leaves.
Schoenoplectus pungens	Chairmaker's bulrush	UM, GP, NE	1-4'	green	June-Sept	W/WP	125,000	
Schoenoplectus tabernaemontani	Soft stem bulrush	UM, GP, NE	3-9'	green	May-July	W/WP	38,000	Long smooth stems are used in weaving and basket making.
Scleria triglomerata	Whip nutrush	UM, GP	2-3'	green	May-Sept	DP/MP		
Sorghastrum nutans	Indian grass	UM, GP, NE	3-6'	copper and green	Aug-Oct	MP/DP	8,300	Similar to A*ndropogon gerardii* in stature, colorful seed heads adapted to dry soils, a bird feeder.
Sparganium eurycarpum	Burreed	UM, NE	2-6'	green	June-Aug	W/WP	600	
Spartina pectinata	Prairie cordgrass	UM, GP, NE	4-8'	green	Aug-Oct	WP	15,800	Our ecologists' favorite grass! Gracefully flowing foliage and stately golden seed heads.
Sphenopholis intermedia	Slender wedge grass	UM	12"-30"	green	Aug-Oct	WW/WD	284,000	
Sphenopholis obtusata	Prairie wedge grass	UM	12"-30"	green	Aug-Oct	DP	12,500	
Sporobolus heterolepis	Prairie dropseed	UM	2-4'	gold	Sept-Nov	MP/DP	14,000	A beautifully shaped grass with aromatic flowers. Another must-have for native grass fans.
Stipa spartea	Needle grass	UM, GP, NE	3-4'	green	May-July	MP/DP	2,100	A graceful and novel plant with large twisted needle-like seeds, also known as porcupine grass. Not for the barefooted - seeds really are needle-like!
Tripsacum dactyloides	Gamma grass	UM, GP, NE	2-5'	green	June-July	WP/MP	500	

COVER CROPS

Avena sativa	Oats	UM	2-4'	gold	varies	DP/MP	800	Preferred cover.
Lolium multiflorum	Annual rye	UM	3-4'	green	varies	WP/MP	14,200	May persist for more than one season.
Secale cereale	Winter rye	UM	2-4'	gold	varies	DP/WP/MP	1,130	Appropriate only for winter cover.

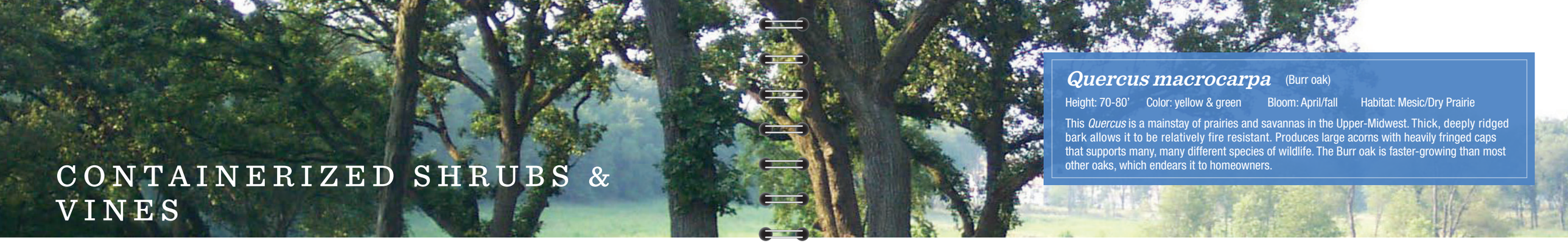
Habitats – DP: dry prairie, WP: wet prairie, MP: mesic prairie, E: emergent, WD: woodland, WW: wet woodland, S: savanna
Regions – UM: Upper Midwest, GP: Great Plains, NE: Northeastern U.S., BF: Canada Boreal Forest

Bird, butterfly or bee attractor
Rain garden/swale
Deer-resistant
Salt-tolerant
Walnut-compatable
Erosion control
Protected in some areas
Makes a good cut flower

Canadian Wild Rye (*Elymus canadensis*) is the perfect native cover crop, a cool season grass adaptable to a variety if conditions from dry to wet, full sun to partial shade. As an early succession species, *Elymus* is a short-lived perennial that sprouts quickly in new restorations and gives way to other species in a few seasons. It tends to stay as a small part of the overall species matrix and in disturbed areas.

REPLACE

GRASSES, SEDGES & RUSHES



CONTAINERIZED SHRUBS & VINES

Quercus macrocarpa (Burr oak)

Height: 70-80' Color: yellow & green Bloom: April/fall Habitat: Mesic/Dry Prairie

This *Quercus* is a mainstay of prairies and savannas in the Upper-Midwest. Thick, deeply ridged bark allows it to be relatively fire resistant. Produces large acorns with heavily fringed caps that supports many, many different species of wildlife. The Burr oak is faster-growing than most other oaks, which endears it to homeowners.

Botanical Name	Common Name	Region	Height	Color	Bloom	Habitat	Seeds/oz	Description
SHRUBS								
Amorpha fruticosa	Indigo bush	UM	3-7'	purple	May/July	WP/MP/S	3,700	Does well in dry, sandy soils.
Callicarpa americana	American beauty berry	GP	3-7'	purple	May/July	WP/WW		
Ceanothus americanus	New Jersey tea	UM, GP	1-3'	white	June/Aug	DP/MP	7,600	The dried leaves can be used as a tea substitute.
Hydrangea arborescens	Wild hydrangea	GP	3-6'	white	June-Aug	WP/MP		
Hypericum ascyron	Shrubby St. John's wort	UM	1-4'	yellow	July-Sept	WP/MP	140,000	A well-shaped shrub adapted to wet ground, with lots of pretty yellow flowers.
Rosa blanda	Smooth rose	UM	2-4'	pink	June-Aug	DP/MP	2,600	Produces large showy flowers throughout the summer.
Rosa carolina	Pasture rose	UM	1-2'	pink	June-July	DP/MP	2,500	A low growing simple and pretty rose.
Rosa palustris	Swamp rose	UM, NE	1-7'	pink	June-Aug	WP	1,600	A beautiful rose that prefers wet soils.
Rosa setigera	Savanna rose	UM	6"-12"	pink	June-July	MP/S	10,000	A cane forming rose – flowers heavily. Good sized rose hips for tea!
Spiraea alba	Meadowsweet	UM, NE	8-12'	yellow-brown	spring/ fall	WP/MP	380,000	Soft, white delicate flowers.
Spiraea tomentosa	Steeple bush	UM, NE	2-4'	pink	July/Sept	MP	380,000	Attractive foliage and bright pink flowers.
VINES								
Aristolochia tomentosa	Dutchman's pipevine	GP	vine	yellow, green	March-May	WP/WW		
Clematis virginiana	Virgin's bower	UM, NE	vine	white	June-Oct	WD/S	16,000	Use this native twining vine to add interest to either a native or traditional shade garden.
Parthenocissus quinquefolia	Virgina creeper	UM, NE	vine 30'	green	June-July	WD	1,900	Showy foliage and ability to climb rock walls.
Vitis spp	Wild grape	UM	vine	green	March-July	DP/WP/MP	95	Perennial woody vine, fruits attract many species of wildlife.

* New names for these species were announced recently. We will leave the original names for this edition of The Handbook, but subsequent editions will list these species by their new names (listed at the end of this section).

Habitats – DP: dry prairie, WP: wet prairie, MP: mesic prairie, E: emergent, WD: woodland, WW: wet woodland, S: savanna

Regions – UM: Upper Midwest, GP: Great Plains, NE: Northeastern U.S., BF: Canada Boreal Forest

Bird, butterfly or bee attractor
Rain garden/swale
Deer-resistant
Salt-tolerant
Walnut-compatable
Erosion control
Protected in some areas
Makes a good cut flower

Rosa carolina is one of many shrubs known as the Prairie Rose. It grows wild on the American Prairie, and produces pink-to-lavendar blooms which become edible fruit known as Rose Hips. These berries are incredibly rich in Vitamin C and other nutrients, making them a favorite of wildlife and the settlers who lived on the prairie. Today, Rose Hips are still treasured for their nutrition and are used commercially to produce vitamins, tea and other products.

SOMETHING OLD, SOMETHING NEW

Occasionally, the International Botanical Conference will publish updated or corrected botanical names of plants. We will try to keep you informed of these changes so we may all be as current as possible in our terminology and our science. Here are the changes for 2018.

Old Botanical Name	New Botanical Name	Common Name
Acorus calamus	*Acorus americanus*	Sweet Flag
Actinomeris alternifolia	*Verbesina alternifolia*	Wingstem
Ageratina altissima	*Eupatorium rugosum*	White Snakeroot
Agropyron smithii	*Pascopyrum smithii*	Western Wheatgrass
Agropyron trachycaulum	*Elymus trachycaulus*	Slender Wheat Grass
Agrostis alba	*Agrostis gigantea*	Redtop
Agrostis stolonifera	*Agrostis alba palustris*	Creeping Bentgrass
Alisma subcordatum	*Alisma plantago-aquatica L. var. parviflorum*	Mud/Water Plantain
Allium tricoccum	*Allium burdickii*	Wild Leek
Alnus incana	*Alnus rugosa*	Speckled Alder
Andropogon scoparius	*Schizachyrium scoparium*	Little Bluestem
Anemone patens wolfgangiana	*Pulsatilla patens*	Pasque Flower
Arenaria stricta	*Minuartia michauxii*	Stiff Sandwort
Arisaema atrorubens	*Arisaema triphyllum*	Jack-In-The-Pulpit
Aster azureus	*Symphyotrichum oolentangiense*	Sky-Blue Aster
Aster cordifolius	*Symphyotrichum cordifolium*	Arrow-Leaved Aster
Aster divaricatus	*Eurybia divaricata*	White Woodland Aster
Aster drummondii	*Symphyotrichum drummondii*	Drummond'S Aster
Aster dumosus	*Symphyotrichum dumosum*	Rice-Button Aster
Aster ericoides	*Symphyotrichum ericoides*	Heath Aster
Aster firmus	*Symphyotrichum puniceum*	Shining Aster
Aster laevis	*Symphyotrichum laeve*	Smooth Blue Aster
Aster lateriflorus	*Symphyotrichum lateriflorum*	Side-Flowering Aster
Aster linariifolius	*Ionactis linariifolius*	Flax-Leaved Aster
Aster macrophyllus	*Eurybia macrophylla*	Big-Leaved Aster
Aster novae-angliae	*Symphyotrichum novae-angliae*	New England Aster
Aster oblongifolius	*Symphyotrichum oblongifolium*	Aromatic Aster
Aster pilosus	*Symphyotrichum pilosum*	Hairy Aster
Aster praealtus	*Symphyotrichum praealtum*	Willow Aster
Aster prenanthoides	*Symphyotrichum prenanthoides*	Crooked-Stemmed Aster
Aster ptarmicoides	*Oligoneuron album*	Stiff Aster (Goldenrod)
Aster puniceus	*Symphyotrichum puniceum*	Marsh Aster
Aster sagittifolius	*Symphyotrichum urophyllum*	Arrow-Leaved Aster
Aster sericeus	*Symphyotrichum sericeum*	Silky Aster
Aster shortii	*Symphyotrichum shortii*	Short'S Aster
Aster simplex	*Symphyotrichum lanceolatum*	Panicled Aster
Aster umbellatus	*Doellingeria umbellata*	Flat-Topped Aster
Baptisia leucantha	*Baptisia alba*	White Wild Indigo
Baptisia leucophaea	*Baptisia bracteata var. leucophaea*	Cream Wild Indigo
Baptisia viridis	*Baptisia sphaerocarpa*	Yellow Wild Indigo
Bidens polylepis	*Bidens aritosa*	Bearded Beggar'S Ticks
Bolboschoenus fluviatilis	*Schoenoplectus fluviatilis*	River Bulrush
Boltonia latisquama recognita	*Boltonia asteroides*	False Aster
Bromus purgans	*Bromus pubescens*	Woodland Brome
Buchloe dactlyoides	*Bouteloua dactlyoides*	Buffalograss

Old Botanical Name	New Botanical Name	Common Name
Cacalia atriplicifolia	*Arnoglossum atriplicifolia*	Pale Indian Plantain
Cacalia plantaginea	*Arnoglossum plantaginea*	Prairie Indian Plantain
Cacalia suaveolens	*Hasteola suaveolens*	Sweet Indian Plantain
Cacalia tuberosa	*Arnoglossum plantaginea*	Prairie Indian Plantain
Campanula americana	*Campanulastrum americanum*	Tall Bellflower
Carex aquatilis aquatilis	*Carex aquatilis altior*	Long-Brackted Tussock Sedge
Carex complanata var. hirsuta	*Carex hirsutella*	Hairy Green Sedge
Carex hirsutella	*Carex hirsutella*	Hairy Green Sedge
Carex lacustris var. laxiflora	*Carex hyalinolepis*	Common Lake Sedge
Carex lanuginosa	*Carex pellita*	Broad Leaved Woolly Sedge
Carex richii	*Carex straminea*	Eastern Straw Sedge
Carex rosea var. radiata	*Carex radiata*	Curly Wood Sedge
Carex tetanica	*Carex meadii*	Mead'S Stiff Sedge
Cassia fasciculata	*Chamaecrista fasciculata*	Partridge Pea
Cassia hebecarpa	*Senna hebecarpa*	Wild Senna
Ceanothus ovatus	*Ceanthus herbaceus*	Red Root
Cornus stolonifera	*Cornus sericea*	Redtwig Dogwood
Cyperus filiculmis	*Cyperus grayi*	Gray'S Flatsedge
Cypripedium parviflorum	*Cypripedium calceolus parviflorum*	Yellow Lady'S Slipper
Delphinium virescens	*Delphinium carolinianum*	Prairie Larkspur
*Dentaria laciniata**	*Cardamine concatenata*	Toothwort
Drymocallis arguta	*Potentilla arguta*	Prairie Cinquefoil
Dryopteris thelypteris pubescens	*Thelypteris palustris pubescens*	Marsh Sheild Fern
Eleocharis ovata	*Eleocharis obtusa*	Blunt Spike Ush
Eleocharis smallii	*Eleocharis palustris*	Marsh Spike Rush
*Enemion biternatum**	*Isopyrum biternatum*	False Rue Anemone
Epilobium angustifolium	*Chamerion angustifolium*	Fireweed
Epilobium glandulosum	*Epilobium ciliatum*	Fringed Willowherb
Erigeron canadensis	*Conyza canadensis*	Horseweed
Eupatorium coelestinum	*Conoclinium coelestinum*	Blue Mistflower
Eupatorium maculatum	*Eutrochium maculatum*	Spotted Joe Pye Weed
Eupatorium purpureum	*Eutrochium purpureum*	Purple Joe Pye Weed
Eupatorium rugosum	*Ageratina altissmia*	White Snakeroot
Festuca obtusa	*Festuca subverticillata*	Nodding Fescue
Gaura biennis	*Oenothera gaura*	Biennial Gaure
Gaura parviflora	*Oenothera curtiflora*	Small Flower Beeblossom
*Gentiana alba**	*Gentiana flavida*	Yellowish Gentian
Gentiana crinita	*Gentianopsis crinita**	Fringed Gentian
*Gentianella quinquefolia**	*Gentiana quinquefolia*	Stiff Gentian
Gentianopsis virgata	*Gentianopsis procera*	Lesser Fringed Gentian
Gerardia purpurea	*Gerardia purpurea*	Purple False Foxglove
Gillenia stipulata	*Porteranthus stipulatus*	Indian Physic
Glandularia canadensis	*Verbena canadense*	Rose Verbena
Gnaphalium obtusifolium	*Pseudognaphalium obtusifolium*	Rabbit Tobacco
Gnaphalium obtusifolium	*Pseudognaphalium obtusifolium*	Rabbit Tobacco
Hasteola suaveolens	*Hasteola suaveolens*	Sweet Indian Plantain
Helianthus atrorubens	*Helianthus silphioides*	Rosinweed Sunflower
Helianthus lateiflorus rigidus	*Helianthus pauciflorus*	Prairie Sunflower
Helianthus rigidus	*Helianthus pauciflorus*	Prairie Sunflower

Old Botanical Name	New Botanical Name	Common Name
Hepatica acutiloba	*Hepatica nobilis**	Sharp-Lobed Hepatica
Hibiscus militaris	*Hibiscus laevis*	Halberd-Leaved Rose Mallow
Hibiscus palustris	*Hibiscus moscheutos*	Swamp Rose Mallow
Hypericum fraseri	*Triadenum fraseri*	Fraser'S St. John'S Wort
Hypericum pyramidatum	*Hypericum ascyron*	Great St. Johns Wort
Hypericum spathulatum	*Hypericum prolificum*	Shrubby St. Johns Wort
Hypericum virginicum	*Triadenum virginicum*	Virginia St. John'S Wort
Hypoxis decumbens	*Hypoxis hirsuta**	Yellow Star Grass
Hystrix patula	*Elymus hystrix*	Bottlebrush Grass
Iliamna remota	*Iliamna rivularis*	Kankakee Mallow
Isanthus brachiatum	*Trichostema brachiatum*	Fluxweed
Isopyrum biternatum	*Enemion biternatum**	False Rue Anemone
Juncus alpinus	*Juncus alpinoarticulatus*	Northern Green Rush
Juncus balticus	*Juncus arcticus*	Arctic Rush
Koeleria cristatella	*Koeleria macrantha*	June Grass
Kuhnia eupatorioides	*Brickellia eupatorioides*	False Boneset
Linaria canadensis	*Nuttallanthus canadensis*	Blue Toadflax
Lithospermum croceum	*Lithospermum caroliniense*	Hairy Puccoon
Melanthium virginicum	*Veratrum virginicum*	Virginia Bunchflower
Nuphar advena	*Nuphar lutea*	Yellow Waterlily
Nuphar microphyllum	*Nuphar lutea*	Yellow Water Lily
Nymphaea tuberosa	*Nymphaea odorata*	White Waterlily
Onosmodium molle	*Onosmodium bejariense*	Marbleseed
Panicum clandestinum	*Dichanthelium clandestinum*	Deer-Tongue Rosette Grass
Panicum implicatum	*Dichanthelium acuminatum*	Old-Field Panic Grass
Panicum latifolium	*Dichanthelium latifolium*	Broadleaf Rosette Grass
Panicum leibergii	*Dichanthelium leibergii*	Prairie Panic-Grass
Paspalus ciliatifolium	*Paspalum setaceum*	Slender Crown Grass
Petalostemum candidum	*Dalea candida*	White Prairie Clover
Petalostemum purpureum	*Dalea purpurea*	Purple Prairie Clover
Poa languida	*Poa saltuensis*	Woodland Bluegrass
Polygonatum canaliculatum	*Polygonatum biflorum*	Smooth Solomon'S Seal
Polygonum coccineum	*Polygonum amphibium*	Longroot Smartweed
Potamogeton pectinatus	*Stuckenia pectinata*	Sago Pondweed
Psoralea esculenta	*Pediomelum esculentum*	Large Indian Breadroot
Ranunculus septentrionalis	*Ranunculus hispidus*	Rough Buttercup
Rudbeckia fulgida sullivantii	*Rudbeckia fulgida*	Showy Black-Eyed Susan
Rudbeckia fulgida umbrosa	*Rudbeckia fulgida speciosa*	Orange Coneflower
Scirpus acutus	*Schoenoplectus pungens*	Hard-Stemmed Bulrush
Scirpus americanus	*Scirpus pungens / Scirpus americanus*	Chairmaker'S Rush
Scirpus fluviatilis	*Schoenoplectus fluviatilis*	River Bulrush
Scirpus pungens	*Schoenoplectus pungens*	Chairmaker'S Rush
Scirpus validus creber	*Schoenoplectus tabernaemontani*	Soft-Stem Bulrush
Scutellaria epilobiifolia	*Scutellaria galericulata*	Marsh Skullcap
Senecio aurea	*Packera aurea*	Golden Ragwort
Senecio obovatus	*Packera obovata*	Squaw Weed
Senecio pauperculus	*Packera pauperculus*	Balsam Ragwort
Senecio plattensis	*Packera plattensis*	Prairie Groundsel
Smilacina racemosa	*Maianthemum racemosa*	Feathery False Solomon'S Seal
Smilacina stellata	*Maianthemum stellatum*	Starry False Solomon'S Seal
Smilax hispida	*Smilax tamnoides*	Bristly Greenbrier
Solidago drummondii	*Solidago rugosa*	Cliff Goldenrod
Solidago graminifolia	*Euthamia graminifolia*	Common Grass-Leaved Goldenrod

Old Botanical Name	New Botanical Name	Common Name
Solidago ohioensis	*Oligoneuron ohioense*	Ohio Goldenrod
Solidago ptarmicoides	*Oligoneuron album*	Stiff Aster (Goldenrod)
Solidago riddellii	*Oligoneuron riddellii*	Riddell'S Goldenrod
Solidago rigida	*Oligoneuron rigida*	Stiff Goldenrod
Sparganium chlorocarpum	*Sparganium emersum*	Narrow Leaved Bur Reed
Specularia perfoliata	*Triodanis perfoliata*	Venus'S Looking Glass
Sporobolus asper	*Sporobolus compositus*	Composite Dropseed
Stachys hispida	*Stachys tenuifolia*	Smooth Nettle Hedge
Stachys hyssopifolia ambigua	*Stachys aspera*	Rough Hedge Nettle
Stachys palustris homotricha	*Stachys pilosa*	Marsh Hedge Nettle
Stipa spartea	*Hesperostipa spartea*	Porcupine Grass
Uniola latifolium	*Chasmanthium latifolium*	River Oats
Utricularia vulgaris	*Utricularia macrorhiza*	Common Bladderwort
Verbena canadensis	*Glandularia canadensis*	Rose Verbena
Vernonia altissima	*Vernonia gigantea*	Tall Ironweed
Viburnum trilobum	*Viburnum opulus americanum*	High Bush Cranberry
Viola palmata	*Viola pedatifida*	Prairie Violet
Viola papilionacea	*Viola sororia*	Blue Violet
Wulfenia bullii	*Besseya bullii*	Kitten Tails

SOMETHING OLD, SOMETHING NEW

NOTES

NATIVE EQUIVALENTS OF COMMON CULTIVAR SPECIES

After reading about all the great benefits of native plants, you may now be wondering how you can make the change. Perhaps you are familiar with particular cultivars that are standards for gardens and plantings...such as Tiger lilies, Hostas and Lamb's Ear. These traditional landscape plants may be near and dear to your hearts, so we would like to help you make a smooth transition by recommending some very similar but *native* species instead. Here you will find some native substitutions for many common garden plants. We think you will be just as pleased growing these instead, while also enjoying all of the wonderful benefits of native plants!

TRADITIONAL SPECIES	NATIVE SUBSTITUTE
Tiger lily	Turk's cap lily *(Lilium michiganese)* Wood lily *(Lilium philadelphicum)* Bottle gentian *(Gentiana andrewsii)*
Astilbe	Foam flower *(Tiarella cordifolia)*
Barberry	Wild rose, Savanna or Prairie rose *(Rosa setigera)*
Bleeding hearts	Dutchman's breeches *(Dicentra cucullaria)*
Blood grass	Little bluestem *(Schizachyrium scoparium)*
Boxwood	Meadow sweet *(Spirea alba)* Great St. John's wort (*Hypericum prolificum*)
Buckthorn	Staghorn sumac *(Rhus typhina)*
Bush form rose	Wild rose *(Rosa carolina)*
Butterfly bush	Butterfly milkweed *(Asclepias tuberosa)*
Carl forester	Blue joint grass *(Calamagrostis Canadensis)*
Coral bells	Alum root *(Heuchera richardsonii)*
Crocus	Pasque flower *(Anemone patens wolfgangiana)* Trout lily *(Erythronium albidum)*
Daylily	Black-eyed Susan *(Rudbeckia hirta)* Blue-eyed grass *(Sisyrinchium campestre)*
Euononymus	Wahoo *(Euonymus atropurpureus)* Bearberry *(Arctostaphylos uva-ursi)*

White lilac (cultivar)

Arrowwood viburnum (native)

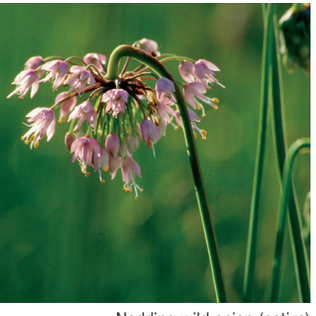
Crocus (cultivar)

Pasque flower (native)

Hosta (cultivar)

Mayapple (native)

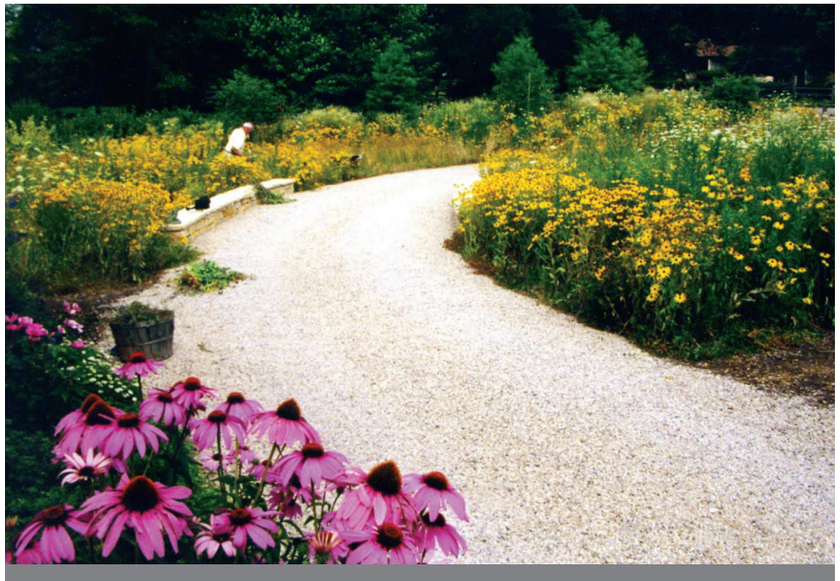
Ornamental onion (cultivar)



Nodding wild onion (native)

TRADITIONAL SPECIES	NATIVE SUBSTITUTE
Forsythia	Witchhazel *(Hamamelis virginiana)*
Fountain grass	Prairie cordgrass *(Spartina pectinata)* Canada wild rye *(Elymus canadensis)*
Hosta	Mayapple *(Podophyllum peltatum)* Solomon's seal *(Smilacina racemosa)* False Solomon's seal *(Polygonatum biflorum)*
Hydrangea	Maple leaf viburnum *(Viburnum acerifolium)*
Lamb's ear	Lead plant *(Amorpha canescens)* Blue sage *(Salvia azurea)*
Lilac	Arrowwood viburnum *(Viburnum dentatum)*
Miscanthus	Blue joint grass *(Calamagrostis Canadensis)* Indian grass *(Sorghastrum nutans)* Prairie dropseed *(Sporobolus heterolepis)*
Norway maple	Sugar maple *(Acer saccharum)*
Norway spruce	White pine *(Pinus strobus)*
Ornamental onion/leek	Nodding wild onion *(Allium cernuum)*
Pachysandra	Wild strawberry *(Fragaria virginiana)*
Penstemon Husker's red	Beard tongue *(Penstemon digitalis)*
Periwinkle	Prairie smoke *(Geum triflorum)* Wild blue lupine *(Lupinus perennis occidentalis)*
Pharagmities/Reed grass	Indian grass *(Sorghastrum nutans)*

TRADITIONAL SPECIES	NATIVE SUBSTITUTE
Potentilla	Great St. John's wort *(Hypericum pyramidatum)*
Red maple	Black tupelo *(Nyssa sylvatica)*
Reed canary grass	Blue joint grass *(Calamagrostis canadensis)*
Rhododendron	Maple leaf viburnum *(Viburnum acerifolium)*
Rockspray	Bearberry *(Arctostaphylos uva-ursi)* Virginia creeper *(Parthenocissus quinquefolia)*
Salvia	Horse mint *(Monarda punctata)* Lupine *(Lupinus perennis occidentalis)*
Sedum	Savanna Joe-Pye weed *(Eupatorium purpureum)* Joe-Pye weed *(Eupatorium maculatum)* Butterfly milkweed *(Asclepias tuberose)*

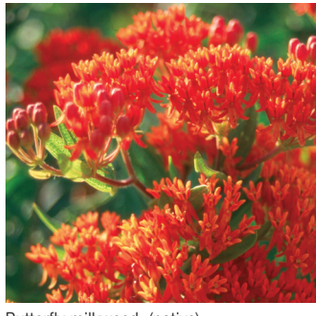


If you're a maverick, complete formal gardens can easily be created using only native plants. Or, for beginners, natives can be incorporated very easily in any formal setting. (And the natives won't have to be replanted every year!)

Fountain grass (invasive)

Canada wild rye (native)

Sedum (cultivar)



Butterfly milkweed (native)

HOW TO USE NATIVE PLANTS

We've long believed that there's no better way to approach nature than through experience and observation guided by science. That's why we strongly suggest landowners invest in some form of ecological evaluation of their property before undertaking native planting projects, so that all subsequent actions have the best chance of positive results.

Proof positive that native plants are appropriate and appreciated almost anywhere. The photo above is of a bed of native plants in a downtown Chicago park. Benches nearby are almost always occupied by city dwellers who come to partake in the plants' beauty and fragrances.

06

Every journey begins with a first step.

A Great Beginning

In any new endeavor, gathering information is a great first step.

Besides this handbook, you should find as many other sources of information as you can. Look in the bibliography in the back of this handbook, haunt your public library, browse book stores, join native-plant clubs and, of course, search the Internet.

You probably realize that native plants are not like the cultivars we are so used to, and require a different set of parameters and paradigms. So take your time. A five-acre prairie restoration can take two to four years to establish. Jumping the gun, working without sufficient knowledge or taking shortcuts can put your investment at risk.

An Ecological Evaluation

If you are considering more than a few plants, a Raingarden, or a Bird/Butterfly/Bee Garden, we strongly recommend that you take the scientific approach. And the larger the area or project, the more detail we recommend in your analysis. A solid base in science will help you protect the environment, your project and your investment. Depending on your site and project goals, this approach may include:

a) A site visit by a trained and experienced ecologist

b) A Natural-Resources Inventory (NRI)

c) Evaluation and mapping of:
- Soils
- Topography
- Hydrology
- Vegetation

d) A Geographic Information System (GIS) survey for the purpose of creating a GIS-data-layered base map with the above information (usually only for larger or more demanding projects).

e) A land-management plan based on all that information and all applicable regulations.

f) Historical research on the ecosystems that were present before; in other words, what you would restore the area *back* to.

If you are attempting a large-scale restoration or if you have any questions, please call us or any other reputable ecological company. We are all happy to share our knowledge and experience with you.

We have plenty of information to share on planting seed, plants, trees and shrubs that will help you get started on your native planting projects. If the scope of your project exceeds what you can reasonably accomplish by yourself, call for help. We have expert installers that specialize in ecological restoration and management.

The Next Step: How to Plant Native Seed, Plants, Trees and Shrubs

SITE PREPARATION

Most native plants are perennials. Perennials–especially flowering plants–may grow slowly the first year and may take several years to fully mature. Patience is required with seeding projects.

The best time of year to install seed is during the spring or fall. In fall, you can plant seed even with snow cover on the groud.

Site Assessment

Before choosing a seed mix, we recommend that you conduct a site assessment. What does this include? Ask questions such as:

- What is your current land-use? Is it agricultural, turf or fallow field?
- What kind of soil do you have? Soil-type effects the time of planting, in that if you have dry, sandy soil, you will want to plant earlier in the spring to avoid dry periods. Also, soil type effects which species of plants are appropriate.
- How wet is the site? Is there ever any standing water? Knowing this helps determine your species selection.
- How much sun does the site get? Knowing this also helps determine your species selection.
- What is the slope like? This will help you determine if you need to use any erosion control methods.

The correct preparation of your site is the most important part of this process. It is absolutely critical!

After you have assessed the site, you should have some basic information to help guide you in the preparation details.

What about "Seed Preparation"?

Many prairie seeds will germinate more readily if they are subjected to a cool period called "cold stratification." Fall dormant seeding allows the seed to go through a natural stratification process, but you can also simulate it yourself by storing dry seed in your refrigerator for 30-90 days.

Slope

If you have bare soil on a slope, you will want to use some kind of erosion control method, such as an erosion-control fabric or mat. You may want to call in a professional if your slope is greater than 3:1 (one foot of vertical height for every three feet of horizontal distance).

Preparing the Seedbed

Begin preparing the seedbed by removing any large debris such as rocks and branches. Kill or remove any grass sod. Till and rake the soil until an even surface is achieved. Remember–old pastures, hay fields and previously fallow fields are usually *full* of weed seed and are some of the most challenging conditions from which to start (see glossary: "seed bank"). Rigorous site preparation is a *must*.

NOW, I'M READY TO PLANT

Sowing the Seed

Planting native seed is very similar to planting other types of seed. Small seeds are planted very shallow and large seeds are planted deeper. A good rule is to plant the seed the same depth as the seed's thickness. For example, a 1/16" thick seed is planted 1/16" deep.

Mulching

There are many alternatives for straw mulch, but none less expensive. Our recommendation is for a light covering of weed-free straw mulch on relatively flat surfaces with a slope that is less than 3:1. On steeper slopes, a single-sided straw erosion mat or professional assistance may be required. Do not use marsh hay; this is may contain seed from weedy species such as invasive Reed Canary grass.

Watering

Watering is usually not needed if seed is installed in the late fall or in spring. However, if you sow seed in the late spring or summer months, you may need to water the seedbed just enough to keep the surface damp, but not wet, if conditions get drought-ee. Over-watering may damage the seeds. Periodic watering during dry years or extended periods of drought will benefit plant survival during establishment.

What about weeds?

If you have thistles, cool-season grasses, crown vetch or other types of aggressive or invasive weeds, you should try to control them. However, there will always be some weeds present in a new planting. We do not recommend hand-weeding until plants are well established. Pulling weeds in freshly seeded areas disturbs the root systems of the natives. Natives are perennials and expend most of their energy in the first two growing seasons developing a good root system. The best method of weed control in seeded areas is an occasional mowing the first two seasons and a third season burn.

MAINTENANCE

Mowing

Mowing will help reduce weed competition, allow more sunshine to reach your young native plants, and encourage deep root growth.

Recommended Mowing Frequency
(for any new seeding area)

During year 1: Mow 2-3 times
During year 2: Mow 2 times
During year 3: Mow once

Please keep in mind that every site is different. There are no magic numbers for mowing, but these recommended amounts reflect years of experience in producing the most successful results (For more details, see the next chapter, "Prairie Restorations: What to Expect and Why").

Purple loosestrife, an extremely aggressive invasive species.

Some tips for mowing include:

- Mow your planting to a height of 6-12 inches.
- Use trimmers and tractors with widely adjustable cutting heights. Conventional lawn mowers may not produce the best results because they cut too short.
- For common agricultural weeds (including: giant ragweed, common ragweed, velvet leaf, lambs quarter and mustards), mow as soon as they flower and keep mowing them as needed. These weeds are commonly aggressive in newer native plantings.
- Thistles often need to be spot-treated with herbicide.
- Mow after June 15th to avoid disturbing ground-nesting birds.
- Spot-mow common perennial weeds (including white and yellow sweet clover) well before they go to seed.
- Ideal timing is when weeds are in bloom, but not far enough along for seed to mature.

Nodding bull thistle, a stubborn invasive. Some thistle species are the hardest plants—invasive or otherwise—to control.

Herbicide

Many common problem-weeds will respond well to properly timed herbicide application. Be sure to identify plants on your site correctly using a plant identification guide (see Chapter 12.0 for resources). Always read and follow label instructions and adhere to local regulations.

PLEASE NOTE: Any work done in wet areas should be done by a licensed professional. Special herbicides and techniques are required to avoid harming wildlife.

There are many tools to apply herbicide, depending on your needs. Some of these include:

- Hand-wicks—good for small areas
- Back-pack sprayers
- ATV-mounted sprayers (includes a boom spray)
- Tractor sprayers (includes a boom spray)

Some common weeds in native plantings that respond well to herbicide control methods include:

- Canada thistle
- Queen Ann's lace
- Canada golden rod
- Red clover
- Garlic mustard
- Reed canary grass
- Sweet clover

Hand Removal

In smaller plantings, you can remove most weeds by hand, but keep in mind that pulling roots will disturb soil and encourage other weed seeds to grow. Sometimes it is best to simply clip weeds at their base; this weakens them and ensures that they do not produce seed.

Prescribed Burning

In the third or fourth year, you may conduct a prescribed or controlled burn if there is enough fuel within the planting. *Please consult a professional!* There are safety, procedural and permitting (legal) issues that you should be aware of. Experienced professionals should be certified as successfully completing fire-suppression training classes recognized by the National Association of Wildfire Managers. Verify the professional you choose is *insured*.

LIVE PLANT INSTALLATION

Buying plugs (container-grown plants)—while more expensive than starting from seed—will yield rapid results.

Soil Preparation

Prepare the area by removing any large debris such as rocks and branches. Kill or remove any grass sod (for more information on how to do this, please see Chapter 7.0, Frequently Asked Questions). Till and rake the soil to create an even surface.

Plant Size

Unless you're planting needs a mature look within a few weeks, we recommend using 32 (2 1/2") pots or 50s. Larger containers such as 4" pots and #1 are usually only a few weeks older. In other words, by choosing larger containers you are mostly paying for more plastic and soil.

Planting

Dig your hole as deep as, or slightly deeper than, the plug roots. The soil should be packed lightly around the roots. Keep the plants well watered for the first two weeks. As a general rule, we recommend planting one plant per square foot. Keep a plant ID tag next to at least one of each species for later identification.

Once plants are established, they will require minimal maintenance. During establishment, remove any noxious weeds before they flower and set seed. If weeds become a problem during the first two years, you can reduce weed competition by mowing to a height of 6-12" inches without harming your native plants.

Mulching

Mulching is not necessary, except for aesthetics and weed control in flower beds.

Watering and Weeding

Once they're well established, water plants only when they need it (for example, at first sign of wilt during a heat wave or drought), but do not over-water or the plants may become dependant on excessive amounts of water. Too much water encourages shallow root growth. Slightly under-watering will force roots to grow deep into the soil in search of water, helping ensure survival during periods of drought.

Some plants go into transplant shock and the tops die back to the ground. This is rather common in plantings done later in the year, but there is a very good chance the roots are still alive and will re-sprout new growth in fall or spring. We recommend cutting back larger plants to two-leaf stages before planting; this will reduce shock. Hand-weed or use spot herbicide to control weeds, but fertilizer is not necessary and will, in fact, only encourage weed competition.

TREE AND SHRUB PLANTING

For tree and shrub installation, soil preparation is not really necessary.

Planting Techniques

We encourage fall planting for the highest survival rate, but if that is not possible, healthy, hardy, quality trees and shrubs can be successfully planted throughout the growing season if they are container-grown and not dug from the ground.

1. If possible, plant your nursery stock immediately. If not, water thoroughly every 3 to 4 days as needed to prevent drying. Protect it from excessive heat or cold.
2. Immediately before planting, water thoroughly. Then remove the plastic container while being careful not to cut or disturb the root ball.
3. Over-excavate the hole by 50%, this will provide a loose area for new root shoots to grow into.
4. Plant stock into the ground at or above the level it was growing in the container. Avoid planting deeper.
5. If planting in a natural setting, we recommend surrounding the tree or shrub with several feet of photodegradable weed barrier mat to prevent weed and grass competition.
6. If planting in an area with heavy deer or rabbit populations, it may be beneficial to install plastic tree guards to protect the base and trunk of the trees.
7. We recommend application of a slow-release fertilizer around each tree in either late winter or early spring. An analysis of 27-3-6 with isobutylidene diurea (IBDU®) or similar is recommended.

Please feel free to call with any questions about the care, handling, planting or maintenance of your trees and shrubs. For naturalized plantings, we can provide information on suggested layout and spacing. On contracted installations, we can also provide weed barrier mats, tree guards and fertilizer on request, and we can also provide professional maintenance services for larger projects.

Prairie Restorations: What to Expect and Why

Within the first year of many prairie seeding projects, we receive calls asking "Where's the prairie? All I see are weeds!" First, let's make sure we mean the same thing; a weed in a prairie planting is any non-native unwanted species. Second, make sure what you see are really weeds. For those used to turf grass lawns, a young native prairie plant may look like a weed. Third—and most important—realize that because of the methods of prairie restoration and the growth habit of prairie plants, weeds are almost always present and visible in the initial phase of the prairie planting. Following is what you should expect in the first few years.

Restored prairie.

YEAR ONE

Site Preparation

In most cases, agricultural fields, old pastures, and fallow fields are selected for prairie plantings. This is not surprising, since historically these areas were probably once prairie or savanna and were converted to farm fields because of their excellent soils.

Site preparation for a prairie uses the same practices and equipment a farmer uses in farming. Depending on the situation, it may be necessary to apply herbicides to kill weedy vegetation, or it may involve disking, tilling, and re-contouring. Unfortunately, these practices are also extremely conducive to establishment of non-native weeds.

In addition, years of agriculture have allowed thousands (sometimes hundreds of thousands) of weed seeds to build up within the soil. While a farmer can apply selective herbicides to control most weeds resulting from disturbing this *seed bank,* the prairie restorationist can't because the herbicides are also lethal to many prairie plants.

Plant Strategies

There can be lots of weeds in a new prairie restoration. *But don't panic.* It's only natural...and usually temporary. Most weeds associated with farm fields and prairie plantings are annuals; they germinate, grow, set seed and die in one growing season. Also most annuals tend to grow early, fast and tall.

On the other hand, most native prairie plants are biennials (two-year life cycle) and *perennials* (which continue to grow year after year). Biennials typically form a low-growing rosette the first year, flower, and die the second year. Perennials, since they depend on below-ground structures for so much of their existence, invest large amounts of time and energy in root production and may show very little above the surface in the beginning. A typical native prairie perennial may have ten to thirty times as much root mass as it shows with above ground growth. For example, the Lead plant *(Amorpha canescens)* is 1'-3' tall for most of its life, but often has roots that reach down 15 feet.

So these contrasting plant strategies of rapid growth vs. slow growth result in what many people see as just a field of weeds. Think of it in context of the fable of the tortoise and the hare; we all know who eventually wins that race. Again, don't panic, be patient. The native prairie plants are in there. And now we can use the weeds' strategy against them.

Site Maintenance

During the first growing season, when the vegetation reaches about 18", mow it down to a height of 6-12" inches. Remember that the weeds' strategy is to grow fast and tall, and cutting dramatically affects the weeds and prevents them from producing seeds. However, the perennials are usually too short to be injured by the mowing. Remember to adjust your mowing height low enough to cut off the flowering tops of weeds before they seed, yet high enough to protect low growing perennials.

We also recommend to refrain from watering or fertilizing because those only benefit weedy species. Native perennials are adapted to the natural conditions and rarely require no additional watering or fertilizer.

YEAR TWO

All the weedy annuals that germinated in year one have died and, if proper maintenance was done, the number of weed seeds in the soil has been greatly reduced. The native biennials and perennials, with their well-established root systems, now begin to allocate a greater

Native prairie planting in the Spring of the second year.

portion of their energy to above-ground plant parts. What you begin to see is called "succession," the process by which one plant community replaces another. In this case, it is the beginning of the perennial prairie species replacing the weed community. Remember, this is not an "all-or-nothing" process, and some weed species can persist for years. Prairie plants—with increased production of above ground structures and superior root systems—will gradually out-compete and replace the weeds. Expect some prairie plants to flower in year two.

Site Maintenance

Since soil disturbance is essential for the weeds to continue to survive, *do not* pull weeds. Even the small area of disturbed soil from pulling a weed can let many more seeds that are still in the soil germinate. Continue mowing as needed.

Fire is an integral part in the maintenance of a healthy native prairie and has been for thousands of years. By investing a large portion of their nutrients into underground roots, prairie plants are well adapted to life with fire. Weedy annuals have no such protection and cannot cope with repeated fires. Again, be patient; one initial fire will not rid your prairie of all weeds. Burning is most effective in early spring or late fall, and if you are not familiar with controlled burning or are dealing with a large area, *please consult a professional.*

YEAR THREE, FOUR AND BEYOND

Burning may be required, if there is sufficient above-ground dried fuel, for several consecutive years. Generally after Year Four, the prairie plants will be well on their way and it may only be necessary to burn every two or three years. Years Three and Four should become increasingly colorful as more and more of the prairie plants reach sufficient health (vigor) to flower.

A professional prescribed burn in action

NOTES

FREQUENTLY ASKED QUESTIONS ABOUT NATIVE PLANTING

If you are new to native planting, you will most likely have lots of questions. In spring, our phones ring constantly. So here are some of the most common questions we receive.

07

Are those *weeds*? Why are there weeds in my newly planted prairie?!? Are they "bad" weeds? Will I ever get rid of all of the weeds? Is it bad to have *some* weeds? Are there any native plants that *are* weeds?

I want to grow native plants. How do I get rid of my turf grass?

Cover the area with black plastic for a full growing season to kill off existing weeds and exhaust the seed bank. Alternatively, you can apply a broad-spectrum herbicide, such as glyphosate, to the turf area. Wait for the turf to die, then remove it by deep-tilling the root structure left behind in the soil. You can also physically strip the sod off of lawn.

What is a forb?

A forb is a flowering plant with a non-woody stem that is not a grass. Think, wildflower.

How late in the fall can I install live plants?

Technically, you can plant until the ground is too frozen to work. However, the recommended latest planting date in the Midwest is generally considered on or near October 15th. In other areas calculate two weeks before the first anticipated week of hard freeze.

Planting by mid-October better ensures the plant's roots will be established enough to withstand the winter without much further care. Planting after mid-October is acceptable as long as precautionary measures take place. For example, applying 3" minimum of mulch is recommended (being careful not to smother the plant crown to allow for light and rejuvenation in the spring) and frequently checking for frost heaving. Frost heaving occurs when the ground freezes and thaws, causing the plug to come out of the ground, exposing the plant's roots to cold and drying conditions. If this should occur, tamping the plant back into the ground is required. Roots should be kept moist, covered and protected from the harsh winter conditions.

In general, it is important to remember that over-wintering plants successfully requires a healthy root system and adequate soil moisture, whether the plants are rooted into the ground or not. Keep weather conditions in mind. With above average temperatures, it is possible to plant later without having to take the precautionary measures of mulching and tamping plants back into the ground.

Are natives aggressive and weedy?

Some natives may be generally more aggressive than others, spreading by stolons (for example, some mints and goldenrods) and prolific seed production (asters, cup plant, false sunflower), but a professionally specified seed mix takes all this into account (as well as soils, shade and other conditions). Most aggressive weeds are non-native invasive species from other regions of the world. These weeds were introduced both accidentally through contaminated imports and intentionally by unsuspecting gardening enthusiasts.

Can I plant natives on my septic mound?

Yes. Choose hardy species that withstand a variety of conditions. Also, avoid species with a large taproot (avoid legumes, *Asclepias* or *Silphium* species). We offer a seed mix specifically for septic mound planting.

How many years would it take to recover the increased cost of establishing a native prairie versus a bluegrass lawn?

If you're starting from bare dirt, *zero*. Depending on species selection and seeding rates, the up-front costs of establishing a native prairie are very similar to those of a typical lawn grass seeding. Prairie plantings take longer to establish than grass, but they require less on-going maintenance and no regular mowing, fertilizer or pesticides. Some communities even offer a tax break for native plantings on your property.

If you are replacing your turf lawn with natives—depending on your situation—you should break even on costs within a few years. Over the long run, you save by drastically reducing costs associated with maintenance: chemicals, fertilizer, watering systems, lawn equipment, fuel—and especially—your time.

How often do I have to do a prescribed burn?

We typically recommend burning every two to three years. Yearly burning tends to decrease species diversity and negatively impact beneficial insect populations and favors grasses. Rotational burning in spring and fall are recommended. Incomplete burns protect wildlife habitat by leaving patches of cover.

When establishing a prairie plot, what percentage of the plants should be grasses? And what percent should be forbs?

There is no one answer for all site needs; however, a general recommendation is 50 percent forbs and 50 percent grasses. To achieve this composition, a seed mix of approximately 6-8 1/2 lbs. of grass seed to every 2-3

lbs. of forb seed is used. The ratio varies based on seed size and species selection.

I just want a wildflower field, why should I plant grasses?

There are four reasons why you should use grasses and sedges in your planting:

1. Native grasses and sedges fill a niche that—if left vacant—will be filled by undesirable species (weeds).
2. Grasses and sedges literally support flowers, holding them up so that they will not lodge (flop over).
3. Grasses and sedges are important hosts for butterflies and provide nesting material, shelter and a food source (seeds and attracted insects) for songbirds.
4. In nature, you would never see a field of just wildflowers. Other plants are required for the field to function as a system (that's why it's called an "eco*system*").
5. Grasses are your canvas and the flowers are your painting. Choose short-statured grasses, allowing the flowers to appear dormant.

Can I mix natives with non-natives?

Yes. Combining natives with non-natives in your formal landscaping is a good way to visually tie your native plantings into neighboring landscapes. Most non-native species are not fire tolerant, so you will not be able to burn mixed areas. Of course, we recommend using as many natives as you are comfortable with.

Check with local experts before planting any non-natives to make sure they will not escape or become aggressive. The perception that introduced species, even supposedly sterile strains, will not spread, particularly in naturalized areas (in contrast with formalized planting areas) is not accurate; it is a fallacy that has been repudiated with disastrous results time and time again. Additionally, the use of aggressive species should never be encouraged in formal or naturalized areas.

I've heard that pollen from many of these prairie plants, such as goldenrod *(Solidago)*, cause allergies. Is this true?

While it is true that some people are allergic to members of the Aster family, including goldenrods, close contact would be required to cause an allergic reaction. Goldenrods and most other native wildflowers are *insect-pollinated* rather than *wind-pollinated*. The pollens of most insect-pollinated species are too large and heavy to remain airborne for any length of time and, therefore, inhaled. Airborne pollens are the cause of most seasonal allergies. Plants that produce airborne pollens include many tree species, grasses and ragweed.

What advantages are there to establishing native plants rather than non-native plants?

There are *many* advantages to planting natives; here are a few:

1. Natives tend to require less watering and chemical use.
2. Natives are hardier in extreme local weather conditions, such as droughts and hard winters.
3. Natives tend to have greater disease resistance.
4. Natives are a preferred source of food and cover for birds, butterflies and other desirable wildlife.
5. Native plantings can help to ease flooding in your area. Natives have deep and varied root systems that enable good stormwater infiltration, (which also replenishes the groundwater), help mitigate flooding and reduce loads on storm sewers.
6. You can feel good about planting natives because you are opening a space to species from some of our most endangered habitats—native prairie, savanna, wetlands and woodlands.

What can I plant that deer won't eat?

Deer are known to eat legumes and are attracted to tall grasses—avoid those and you have a good start. Also see the Deer Tolerant species listed in the Species List section of this handbook.

What can I plant that *will* attract and support deer?

Indian grass *(Sorghastrum nutans)*, Purple prairie clover *(Dalea purpea)*, Canada tick trefoil *(Desmodium canadense)*, Round-headed bush clover *(Lespedeza capitata)*, Illinois tick trefoil *(Desmodium illinoense)*. Deer are looking for cover provided by tall grasses. They prefer to browse on blossoms in early spring and legumes throughout the season.

Is it necessary to have the soil tested before establishing a prairie?

Not typically, though it is a good idea to assess the relative amounts of sand or clay present.

How many different plant species are necessary?

Native communities are composed of hundreds of species. A baseline mix for a new restoration should contain at least 2-4 grasses and 6-12 forbs. However, the sky is the limit, and high species-diversity is usually better. We recommend at least 30 species per planting if budget and site conditions allow.

Is soil fertilization necessary before establishing a prairie?

No. The use of fertilizers is definitely *not* recommended. Prairies thrive in low-nitrogen environments, while weeds thrive in high-nitrogen environments. When you fertilize, you're feeding the weeds.

Do established prairies need to be watered during dry spells?

No. Extra water is needed only during establishment when drought occurs.

Should one establish a prairie using seeds, seedlings, or a combination?

This answer depends on your budget and how quickly you want establishment. Starting from seed takes a minimum of three years, but is very cost-effective. Starting with plants gives immediate results, but is fairly costly for large areas. Many people prefer to start with a combination of seeding large areas while using plants in specific accent areas. For smaller and more formal areas, plants will quickly produce superior results.

What will the plant look like when it is grown?

Refer to a good field guide such as Peterson's. Also, Google Images is a good search engine to find photos. See Appendix A for further resources on native plants.

Will there ever be a time when all the weeds are gone?

No. Even minor soil disturbances such as ant mounds and animal tracks provide sufficient habitat for some weeds to establish.

Is it harmful to have some weeds?

No. As long as weeds are kept to manageable levels they will not present a problem. In fact, some weeds are quite attractive when they flower.

Are there alternatives to burning?

Yes. It isn't *exactly* an equivalent, but very low mowing during the dormant season—so low that dust and dirt fly—is a non-fire option. You won't see quite the same result, but it is helpful. Prairie plants are adapted to fire, which concentrates nutrients and blackens the surface. After fire, soil warms faster in spring and more nutrients are readily available, allowing prairie plants to begin growth earlier than on mowed sites.

Are all weedy species annuals?

No, some weedy species, such as bluegrass and sweet clover, are perennials. These species are not as easily removed or replaced through succession, competition, mowing or fire. While they might not be eliminated for a number of years, good practices can reduce them to minor components within the prairie landscape.

I'm not interested in doing a restoration, can I just plant a few species?

Yes! We encourage species diversity, but we know it isn't for everyone or every space. Adding even one native species is creating a bridge that was otherwise completely absent.

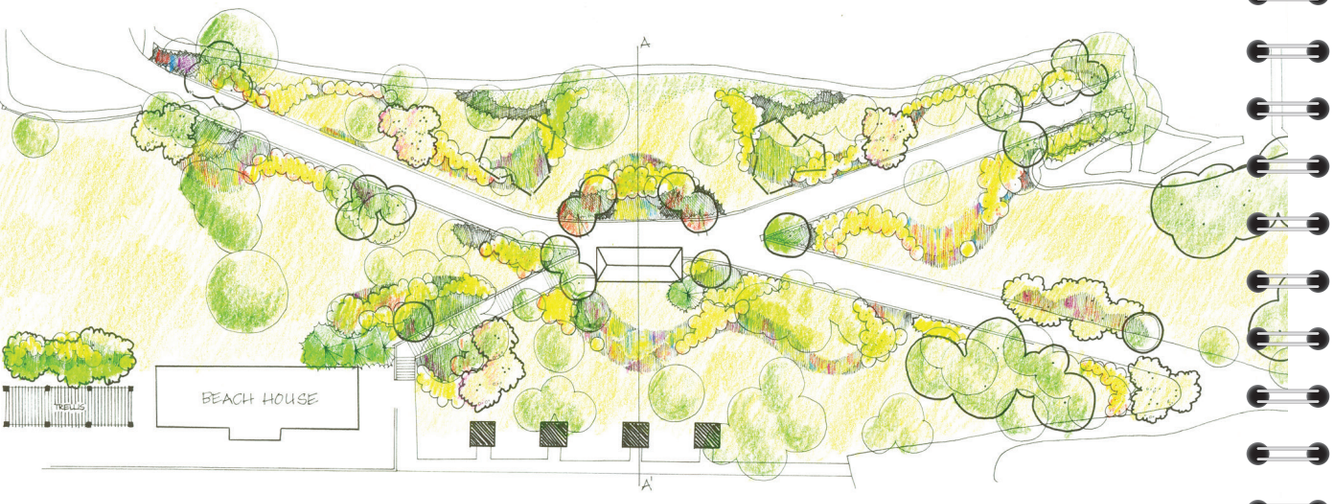
I want to plant native, but I'm afraid my planting will look messy and I like structured look. What should I do?

Select clump-forming species which are strong on form and structure and not too tall. Keep your plant list simple, 3-7 species. Consider using a blend of natives and your favorite heirloom variety perennials to create familiar structure. See more on this topic in Section 8.1

Many plant species are necessary for an ecosystem; they are often interdependent upon each other, and the wildlife is often dependent on *all* of them. Therefore a good mix of species ("diversity") is best for the health of the overall ecosystem, as well as the individual plants, animals, insects.

BASIC NATIVE LANDSCAPE DESIGN

Native Landscape Design can be anything from a very structured and formal garden created with native plants to an area that is just a jumbled riot of native plants that is "designed" only in that it has borders (the so-called "prairie garden"). That is one of the beauties of native plants: you can have them pretty much any way you want, with very few rules.



PLANTING DESIGN

NORTH

SCALE 1" – 20'

This planting plan is an example of a formal use of native plants. In this design, the plantings deliver the benefits of a formal garden (shapes, heights and colors planned and controlled to a design concept) with the benefits of native plants (long-lived perennials, low maintenance, habitat for birds, butterflies and excellent stormwater infiltration).

08

1. Design *with* the land

Observing the existing landscape around you can tell you a great deal about what will work and what won't in your landscape. For example, many property owners and designers like to incorporate evergreen vegetation in their planting or design. However, most commercially available evergreen species don't perform well in calcium-rich soils. Much of the Midwest is underlain with limestone/dolomite bedrock, as evidenced by limestone outcrops and road cuts. This produces calcium-rich soils, and designing without considering this constraint of the land could result in failed plantings, disease-prone plantings or excessive maintenance (and costs).

2. Design from the right beginning

Conventional design tends to use a "clean slate" approach, where the owner or designer envisions the property as vegetatively void and adds material to an imagined austere environment. Designing with native plants takes the decidedly *opposite* approach; imagine your property is *covered* with the appropriate native vegetation and carve out of that system the spaces needed for the intended site use (building, parking, lawn, etc.).

3. Design with ecological parameters

Your design should not threaten native systems, should not contain invasive species, nor should it contain native species that are not indigenous to your region. It should take into consideration soil types and terrain. For instance, any design for the side of a hill should have anti-erosion properties.

4. Designing with native plants

Use appropriate species in appropriate locations; this is a design ethic that must be maintained for successful native planting design. When designing naturalized areas, wetland species should be planted in wet areas, dry species in dry areas, species native to Wisconsin in Wisconsin, species native to Georgia in Georgia.

5. Minimize high-maintenance areas

The cost-savings of using native plants are better realized with larger and more naturalized use. The greatest cost-savings are found where large areas can be converted to one type of native-plant community, such as prairie, from conventional maintenance-intensive use, such as lawn. The less formalized the native planting, the less maintenance required; large tracts of prairie require less vigilant weeding than formalized native plant beds adjacent to building entrances or in formalized areas.

6. Formal gardens

Natives can be used to create formal gardens. Select clump-forming species which are strong on form and structure. Species like *Allium cernuum*, *Sporobolus heterolepis*, *Carex lupulina*, *Polemonium reptans*, *Ruellia humilus*, *Oligonueron album*, *Heuchera richardsonii* and *Coreopsis lanceolata* are great examples. Select species 1 or 2 specimen plants. These would be large, visually interesting plants, such as *Silphium terebinthinaceum*. When planting a formal garden, select species which do not readily reseed or plan to dead head. If you are lucky enough to have a large lot, try this technique: Plant a large diverse garden away from buildings. Then select 3 or so of your favorite species and plant in a series of smaller gardens near your home and any outbuildings. This will visually tie the gardens together and help your eye make sense of what it is seeing. You can also use a blend of natives and your favorite heirloom variety perennials to create familiar structure. When choosing non-native perennials, we advise using old-fashion heirloom varieties because these provide better pollinator service than newer varieties.

Benefits of Native vs. Conventional Design:

1. Native landscapes function more efficiently.

   Using plants indigenous to a region means they will be better suited for existing site conditions such as soil, hydrology, season and climate. In nearly all cases, native plants do not require additional nutrient input or pest control.

2. Similarly, local insect, bird and animal populations will be quicker to adopt and live in native landscapes.

   In fact, if you live in a heavily developed or farmed area, your native planting may become a magnet for native insects, birds and animals, since it is a natural area with indigenous plants that they depend on. It may become your own private wildlife preserve.

3. Native landscapes provide higher-quality wildlife habitat.

   Plants indigenous to the region provide the proper mast (food) and cover needs of wildlife indigenous to the region. Often the most beneficial organisms such as butterflies, dragonflies, and some bird species require specific native-plant communities for healthy development. For instance, Monarch Butterflies *only* lay eggs on milkweed plants and the larvae *only* feed on milkweed leaves.

IDEA GALLERY

Now that you know the basics, you probably want to start putting the information to use and work with native plants on your own. Here we provide several examples of native-landscape projects.

Projects are a great way to introduce people to native plants. Here, young volunteers of the Spring Valley (WI) 4H Club plant a Pollinator Garden at an elder-care facility. The residents already have bird feeders located nearby, which they enjoy watching. When the garden blooms, it gives the residents a lot of additional pleasure and hours of entertainment.

09

PROJECT IDEA:
Monarch WayStation Habitat

Tremendous amounts of habitat have been lost throughout the monarch's range, primarily due to development and changing agricultural practices. While it may not be possible to restore the habitat that was lost in its entirety, there are many opportunities to enhance and restore habitat for monarchs and pollinators in marginal areas, such as roadsides, fence rows, corporate lawns and your own backyard.

•Check out Monarch Watch at MonarchWatch.org to learn more about protection and providing

PROJECT IDEA:
Plant a Rain Garden

A Rain Garden is a popular perennial garden design for many reasons:

- Rain Gardens can be small and, as such, they fit into most yards with ease. They are also a great way for beginners to experience native plants... a first-step, so to speak.
- But don't let their size fool you. Rain Gardens provide an excellent way of controlling rainwater runoff, thus conserving precious water supplies and helping protect the water quality of downstream lakes and rivers.
- Rain Gardens are planted with native wetland and prairie wildflowers and grasses. These perennial plants naturally grew here when the first pioneers rolled across our land—so they're hardy and low-maintenance, not to mention beautiful!
- Rain Gardens provide food and shelter for many interesting birds, butterflies and beneficial insects—such as swallows, purple martins and dragonflies—all of which eat mosquitoes.

To make a Rain Garden, just follow these steps:

1. Pick a spot in your yard, at least 10 feet away from your house in line with the drainage path of your lot. Choose a location with full sun, but if that's not possible, make sure it gets at least half a day of sunlight.

Residential rain garden

2. Plan the basic shape of your rain garden by outlining it with a garden hose or rope. The size and shape is up to you. Make sure any overflow follows the drainage pattern originally designed for your lot. If you need to, dig a shallow swale to direct overflow appropriately.

3. Remove the grass or sod and place it in your compost bin, or reuse it in bare areas of your yard. You can also lay a sheet of black plastic to kill the sod, but this method usually takes a full year.

4. Dig a shallow depression; two to six inches will suffice if you don't want standing water. If you want standing water, dig your depression deeper, perhaps down to 18 inches in the deepest spot. Slope the sides gradually from the edge to the deepest area. Heavy clay soil may hold water just fine; if your soil doesn't hold water, use a plastic liner in deeper areas and install your plants around the edges of the liner.

5. Direct your downspout or sump-pump outlet to your Rain Garden depression, either by digging a shallow swale for water to run into the depression, or by piping the runoff through a buried 4-inch black plastic drain tile.

6. Plant native plants appropriate for rain gardens. Please see the species list in this handbook.

7. Water your plantings every other day for the first two weeks or so, until they appear to be growing well. (If you have a severe drought or heat wave, water more.)

8. Once your native Rain Garden plants are established, they'll thrive without additional watering. Don't fertilize, and remove any initial weeds that appear.

PROJECT IDEA: PLANT A RAIN GARDEN (continued)

A few more tips...

- Try not to spread or spray lawn fertilizers too close to the Rain Garden. Fertilizers will actually stimulate weeds and create competition for the native plants.
- Don't worry about mosquitoes. Usually, once mosquitoes appear, dragonflies, swallows and purple martins will find about your "buffet" and take care of them. If mosquitoes do become a problem, however, you can buy a "mosquito dunk" (containing the organic bacteria Bt) to kill mosquito larvae in your areas of standing water.
- In the winter, the dead vegetation in your Rain Garden will catch snowflakes and frost, providing additional interest as a beautifully textured winter landscape.
- Come spring, mow and remove dead vegetation. Or if you can, burn it off. Check your local ordinances, or call your fire department for regulations.
- Place a bird house nearby. Swallows and Bluebirds are especially beneficial in the appropriate regions.
- Put a comfortable bench nearby so you can relax with a friend while admiring the blooms, birds and butterflies.

PROJECT IDEA:
Plant a Pollinator Garden

A Pollinator Garden

Pollinator Gardens preserve natural communities by providing homes, shelter and food for some of the most beautiful and hard-working winged members of our ecosystem.

Be sure to use "wild-type" plants, rather than cultivar versions. Research shows that several classes of polinators have a strong preference for wild-types of cultivars.

The native prairie wildflowers specially chosen for your garden will provide hours of enjoyment for you while they support all life stages of butterflies and native bees (from egg, to caterpillar, to pupa, to adult), and furnish food and shelter for birds. Some of these perennial plants will bloom all season into the fall.

Which pollinators will my garden attract?

Left: A familiar native pollinator, one of the 49 species of Bumblebee in North America. *Right:* An unfamiliar native pollinator, a Sweat Bee of the Augochlorini tribe, a common North American native bee. (The Augochlorini is actually about 1/4 the size of the Bumblebee.)

In addition to insects, Pollinator Gardens can attract hummingbirds, bluebirds, chickadees, goldfinches, house finches, cardinals, and all kinds of migrating songbirds such as many types of warblers.

Butterfly visitors to your yard could include yellow swallowtails, black swallowtails, red admirals, cabbage whites, mourning cloaks (in wooded areas), and monarchs, all of which are especially fond of Rough blazing star (*Liatris aspera*) and New England aster (*Aster novae-angliae*). Plant Wild lupine (*Lupinus perennis*) in your garden, and you may be lucky enough to spot the endangered Karner blue butterfly, a rare species which is dependent upon that plant for breeding. Milkweeds draw Monarchs like magnets.

A Word on Bees

Native bees - and let's be absolutely clear we're only talking about *native* bees - are very much in the limelight lately. Stocks of European honeybees are suffering die-offs from diseases, viruses and parasites that scientists are having trouble identifying and controlling. This is troubling because European honeybees are a crucial part of our agriculture, if not the foundation. Virtually all the fruits and vegetables we buy are pollinated by billions of domesticated European honeybees. You see their white box-hives everywhere.

Bee Mimic on Goldenrod

They also pollinate the crops that make up the majority of the food for our livestock. So when the honeybees are harmed, the effect on our food supply – prices *and* availability – is direct. Native bees also do this work, but have been crowded out.

Many people – scientists, farmers and lay people – think a solution lies with native bees, the ones that were here and were responsible for pollinating our crops before we brought in the European honeybees.

The best known native bee is the familiar Bumblebee. It is also one of the few native bees that is social (meaning they live in groups) and that can sting. In fact, the vast majority of native bees don't even *have* stingers.

Bee Mimic on Goldenrod

Native bees come in hundreds of shapes and sizes. Most live solitary lives, feeding, nesting and laying eggs as individuals. They feed on the same kinds of plants as butterflies, and they lay their eggs in the hollow stems of these plants (as well as other hollow places).

Pollinator gardens are also attractive to another winged creature–the dragonfly. These four-winged flyers are not only pretty, but they are also voracious mosquito-eaters and welcome in *everyone's* yard.

Under-Appreciated Pollinators

Flies are frequently mistaken as bees and are perhaps the most active and important group of native pollinators. Flies have one set of wings held out or at angle from the body, eyes tend to be forward on the head, and antennae are short or absent.
True bees have 2 sets of wings held folded in, eyes are typically positioned on the side of the head and antennae are present and usually long. An addition, flies tend to be less hairy than bees – although this is one of least reliable ID features as hairiness varies greatly among both bees and flies.

How do I make a Pollinator Garden?

Choose a sunny site out of the wind. Butterflies prefer feeding in areas where they don't have to fight air currents. Well-drained soils are preferred, but native plants are so adaptable that almost any soil type will do. If your soil is heavy clay, you may wish to add organic matter like peat or composted manure, available at any home and garden center.

It's easy! Just follow these simple steps:

- Plan the basic shape of your Pollinator Garden by outlining it with a garden hose or rope. The size and shape is up to you!
- Kill or remove any grass or sod.
- The garden can be raised a couple of inches with soil or planted directly into the existing grade. If you add soil, be sure to work it in with the existing material.
- Plant the native plants appropriate for Pollinator gardens. Please see the species list in this handbook.
- Plants should be spaced one foot apart in a grid pattern. Insert plant tags next to each group of species for quick identification when weeding.

HOW DO I MAKE A POLLINATOR GARDEN (continued)

A few more tips...

- Mulch the area (2" to 3" thick) to help keep weeds

down and hold in moisture, making sure to keep mulch away from the base of each plant.

- Water every other day until the plants show new growth.

Once your native plants are established, they'll thrive without additional watering. Fertilizers are not necessary. And only minimal weeding will be needed; short, weekly stints of about 15 minutes will make weeding easy.

A few more tips...

- As with any native planting, try not to spread or spray lawn fertilizers too close to the Bird & Butterfly Garden. Fertilizers will actually stimulate weeds and create competition for the native plants.
- Come spring, mow or clip dead vegetation when new growth is less than a foot tall.
- To attract birds, place bird houses nearby.
- Install a comfortable bench nearby so you can relax with a friend while watching the birds and butterflies. Purchase a guidebook and try to identify the different species.
- Place natural rocks or other garden ornaments in and around your Pollinator Garden; be creative! You'll learn and have fun while designing your own backyard landscape.
- Join the Xerces Society (http://www.xerces.org)

Butterfly facts:

Most adult butterflies live an average of 2 to 4 weeks if they do not fall victim to predators. Many butterfly species require specific host plants in order to survive. Golden Alexander is a host plant for Swallowtail butterflies. Butterfly milkweed is a host plant for Monarch butterflies. Fox sedge is a host plant to the Skipper family of butterflies.

PROJECT IDEA:
Designing for Wildlife

Landowners have great opportunities to establish native communities on their properties, whether they choose prairies, wetlands, oak savannas or others. Our experience is that "if you build it, they will come." That is, if you establish an appropriate community

A high-quality natural area restoration will be readily apparent by the wildlife that moves in; truly a case of "if you build it, they will come."

(habitat), it will attract game and non-game species for you to enjoy. Remember, planted "food plots" are—at best—temporary. Worse, many of the so-called "wild-game seed mixes" contain undesirable non-native species that may cause more harm than good. We do not condone this approach. See Section 3 in this handbook for guidelines on judging the quality of seed and plants. If you truly appreciate nature and wildlife, talk to some experts. For instance, we've helped hundreds of landowners develop property to:

- Attract pheasants, quail, deer, turkeys, ducks and other wildlife by establishing cover and forage for them.
- Provide a beautiful landscape with flowers that bloom throughout the season.
- Attract many species of beautiful butterflies and birds.
- Create a 'winter oasis' using textured landscape and native plants where wildlife can find shelter and food

PROJECT IDEA:
Other Landscapes
Lakeshores

Too often, lakeshore property owners maintain a turfgrass lawn down to a sand beach or the water's edge and call it a "lakeshore."

A healthy lakeshore can improve to the water quality of the lake.

Nothing could be further from the natural truth. Turf lawns are an artificial monoculture that increase the amount of stormwater runoff, sediment, pollutants and nutrients entering the lake and degrading water quality. Beaches occur naturally only where strong erosive forces such as waves and currents carry away most of the lighter organic component of soil, leaving only heavier particles of sand and rock. While maintaining small areas of lawn and beach may be desirable for outdoor activities, all lakes would benefit greatly from remaining lakeshore areas being restored through good ecological practices. If everyone living on lakes adopted these practices, water quality and entire lake ecosystems would improve dramatically.

Shoreline plantings of native plants, trees and shrubs offer tremendous erosion control and water-quality advantages over turf. In addition, native vegetation at the water's edge attracts food-species—and therefore *gamefish*—to your shoreline habitat.

Building a pond or lake

If you just dig a hole and fill it with water, you'll have, well, a hole with water in it – at least, until it drains. A pond or lake has a specialized structure *and* is an incredibly complex ecosystem. There is hydrology, shoreline vegetation, runoff, aquatic vegetation, fish... and dozens of other aspects to consider. If you're going to invest in land, money and time to build a lake or pond, consider consulting an ecological expert first.

Land-management plans

There are *many* grant and cost-sharing funds available to land-owners. To this end, land-management plans are more than just good procedure. Much of what is in a professional land-management plan is directly usable

Pond with native plantings.

in applications for grants. Your ecological consultant should know the funding opportunities available to you.

EXAMPLES

What do these native planting projects really look like in action? What will they grow to become? Well, here we give you a look a few examples of successful ecological projects using native species.

Native prairie at a local church; another church was threatened with a violation of their town's "noxious weed" ordinance.

Rain garden in residential landscape.

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You might recognize this Pollinator Garden from the "before" photo on page 9.0. Your 4H volunteers planted it behind an elder-care facility. Two years later, in early spring it was just about to explode in blooms and blossoms. Native forbs tend to flower for longer periods than cultivars, and the different species will bloom at different times, giving the residents many months of beauty.

Introduce Your Local Government To the Benefits of Native Plants

This is a little more important than you might think. Taylor Creek Restoration Nurseries and local volunteers planted an area of prairie for a local church. Soon after, the town government sent the church a letter referencing the prairie planting and threatening them with a citation for violating the local ordinance on "noxious weeds".

After we made a presentation to the town council about native plants and their benefits, they voted unanimously to review the ordinance and also requested proposals on how they could use native plants to mitigate stormwater runoff from the town's schools, town buildings and facilities, and their parking lots.

So consider introducing the concept of native plants to your local government—not only might it smooth over some potential rough spots for residents, but it might also win over a lot of new converts.

Residential Native Landscape Design

The native landscape design for this example residence includes 1.5 acres of mesic and wet prairie behind the house and two additional rain gardens along the back of the home. The landscape was designed to be enjoyable from the ground as well as from the rear deck, which overlooks the intertwining components of the landscape. A rain garden that starts near the top of a small hill directs rooftop runoff down the hill into a larger rain garden that spirals away from the house. This landscape element was inspired by a galaxy form, because the residents enjoy stargazing. The flagstone patio and perennial beds intermingle with the rain garden, reinforcing the forms and strengthening the design concept.

Prairie at Kankakee Sands, Indiana

ADD CAPTION

Native planting at South Milwaukee school campus

Stone Prairie Farm; an 80-year journey from prairie to dairy farm, then back to prairie and so much more

Habitat Restoration (Prairie, Wetland and Savanna)

Using over 200 native species, The Nature Conservancy, with the help of Applied Ecological Services, restored 7,200 acres of drained agricultural land to native wetland, mesic prairie and savanna, resulting in new habitat for rare plants and animals.

In addition, an on-site nursery was established to propagate plants and seed to be added to the project. Native seed was gathered from several remnant sites in the area, the seed was germinated and the plants propagated, then the seed from those plants (several hundred times the amount that was wild-gathered) was harvested. Some seed was stored for use in the continuing project, and some was propagated into live plants to be installed in the project. In this manner, large quantities local-genotype seed and plants were provided without impacting the remaining local populations.

Riverboat Road Restoration

The River Revitalization Foundation, a prominent Milwaukee non-profit conservation organization, acquired a significant property along the Milwaukee River with important connections both recreationally and ecologically. Applied Ecological Services was hired to design the site and construct the improvements. Working with Taylor Creek, native seeds and plants were selected to support the new constructed naturalized shoreline and "backwater" habitat zone that was designed to fluctuate with the seiche effect of Lake Michigan.

This project was ideal to showcase the application of natives in a variety of habitat-types, ranging from riparian to dry prairie – even formal landscaping application. Because of our commitment to the project, AES and Taylor Creek donated several hundred plants to round out the project, above and beyond the original design.

Native Landscaping on Rare Wildlife Habitat

Wildlife habitat for two rare species – a Wisconsin state-endangered perennial, the Bluestem goldenrod *(Solidago caesia)* and a Wisconsin state-threatened species, the Butler's garter snake *(Thamnophis butleri)* —was threatened by the construction of a new school campus in South Milwaukee. To alleviate these concerns, a native-landscaping plan was created to protect the habitat, compliment the new architecture of the school building, and provide aesthetically pleasing landscape interest throughout the year. In addition, the site now provides an outdoor classroom for students studying the ecology of the prairie and woodland landscape. The site was awarded a 2006 Conservation and Native Landscaping Award from the U.S. Environmental Protection Agency and Chicago Wilderness.

A Place For You and Your Wild Friends

AES owner, Steve Apfelbaum, turned a run-down Wisconsin dairy farm into an icon of the Environmental movement – 80 acres of prairie, savanna, wetlands and a spring brook, all exploding in blooms and home to an astonishing diversity of wildlife: pheasant, deer, raccoon, skunk, and more songbirds, small mammals and amphibians than you can count, plus a menagerie of reptiles and amphibians.

Steve also rebuilt the farmhouse into its own ecological wonder. Complete with Russian Oven (that heats the entire house on a few logs), purpose-built root cellar (fresh vegetables all year), solar panels and one of first privately-owned power-generating windmills in the county, it is practically self-sufficient and almost a definition of the term "sustainable."

Steve's 30-year odyssey is chronicled in his book, *Nature's Second Chance*, with a forward written by friend Nina Leopold Bradley (one of Aldo Leopold's two daughters). It is published by Beacon Press.

ABOUT US

This handbook is brought to you by Taylor Creek Restoration Nurseries.

ADD TEXT ABOUT TCRN HERE...

Propagation fields and greenhouse at Taylor Creek Restoration Nurseries.

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Our Restoration Nurseries in Wisconsin and Kansas provide some of the best-quality native plants and seed available. Together, they are among the largest restoration/native-plant nurseries in the Midwest.

Our Restoration Nurseries, our Philosophies and our Goals

Prior to the European settlement of North America, it was all prairie, savanna, woodland and wetland. So today, when we plant—for instance—prairie, chances are there was prairie there long ago. So we believe we are restoring it.

We produce and provide the highest quality *native, local-genotype* seed, plants and trees available. Our seed is collected within about a 150-mile radius of each of our nurseries. We track seed origins very carefully and carry more than one genotype. Most of our seed for sale is nursery grown. Beds were started from seeds collected ethically on native remnants. We still do some wild collection to preserve and promote diversity, by contract with landowners, but never collect more than 1/3 of the seed present.

APPENDIX

Additional Sources of Information

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Broad information on both native and non-native species occurring in the U.S. can be found at www.plants.usda.gov.

The Audubon Society: www.audubon.org

Monarch Watch: www.monarchwatch.org

National Invasive Species Information Center, United States Department of Agriculture National Agriculture Library: www.invasivespeciesinfo.gov

The Xerces Society (for invertabrates): www.xerces.org

- *Attracting Native Pollinators: Protecting North America's Bees and Butterflies*
- *Farming with Native Beneficial Insects*

Nature's Second Chance,
by Steven Apfelbaum

Reviewed by Dr. Alan Haney, Dean of the College of Natural Resources at The University of Wisconsin-Stevens Point

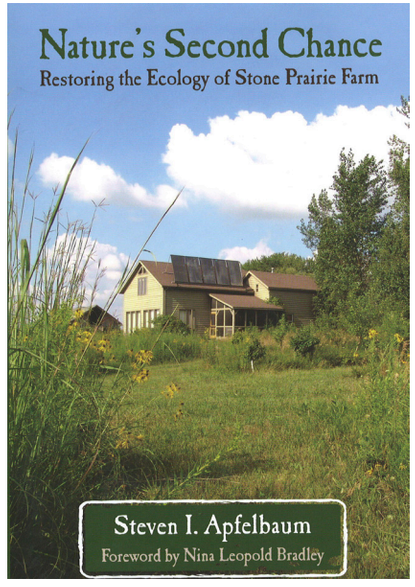
From an internationally recognized restoration ecologist comes the twenty-first-century sequel to Aldo Leopold's *A Sand County Almanac.*

Renowned conservationist Aldo Leopold once wrote, "A thing is right when it tends to preserve the integrity, stability, and beauty of the biotic community. It is wrong when it does otherwise."

Few have taken Leopold's vision more to heart than Steven Apfelbaum, who has, over the last thirty years, transformed his 80-acre Stone Prairie Farm in Wisconsin into a biologically diverse ecosystem of prairie, wetland, spring-fed brook, and savanna. *Nature's Second Chance* is the story of that transformation as well as of the work of the firm Apfelbaum started, Applied Ecological Services, first restoring neighboring farms, then projects in neighboring states, and now projects in countries *around the world.*

Nature's Second Chance breathes with a refreshing air of ecological possibility, drawing from the author's personal story of how he has, with help, succeeded in turning back the clock on development to give nature—and humanity—a second chance at sustaining healthy ecosystems.

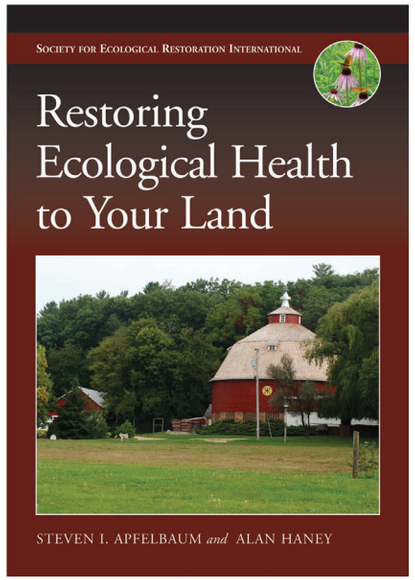
In *A Sand County Almanac*, Aldo Leopold struggled to define a 'land ethic.' In *Nature's Second Chance*, Steven Apfelbaum documents the struggle to *put it into practice*, and explores the application and implications of becoming part of the 'land community.' Although the reader will see some parallels among the plethora of 'back to the land' books, none come even close to the insight of *Nature's Second Chance*.



Nature's Second Chance is published by Beacon Press and is available through Yahoo Books, Amazon.com, Barnes & Noble, and other online and brick-and-mortar bookstores everywhere. A portion of the proceeds goes directly to the Aldo Leopold Foundation.

Restoring Ecological Health to Your Land

by Steven Apfelbaum and Dr. Alan Haney



Restoring Ecological Health to Your Land was co-authored by Steven Apfelbaum and Alan Haney. Haney is Emeritus Professor of Forestry and former Dean of the College of Natural Resources at the University of Wisconsin-Stevens Point, and has taught ecology at the collegiate level for 38 years. Over 50 graduate students (including Steven Apfelbaum), have earned their degrees under his tutorage. Haney has published dozens of peer reviewed research papers on invasive species, ecosystem function, and restoration ecology. He and Apfelbaum have collaborated on studies of disturbance ecology in the southern boreal ecosystem and oak savanna restoration since 1976.

As you might guess, *Restoring Ecological Health to Your Land* is an instruction manual for restoring ecological health to your land. It combines the total experience of both Apfelbaum and Haney, and lays out the history, the science and the philosophies involved in personal and local ecology.

Written in a simple, straightforward style, it is geared for readers with minimal ecological training. It begins with a review of basic ecology to explain the principles, process, and techniques of ecosystem restoration, uses examples from across North America to illustrate principles and techniques and includes specific information on restoring high-maintenance systems, such as farm fields, lawns and gardens, to healthier ecosystems.

Also Available:
Restoring Ecological Health to Your Land: A Companion Workbook

Steven Apfelbaum and Dr. Alan Haney's *Restoring Ecological Health to Your Land: A Companion Workbook*, is available to help restorationists put into practice the concepts and lessons of the original text. With step-by-step instructions, templates and guides for planning, costing, implementing, and monitoring restoration projects, *Restoring Ecological Health to Your Land: A Companion Workbook* will let these restorationists work on and improve their own land to achieve their own ecological goals, at their own pace and schedule, with their own land-use decisions. The workbook with include links to digital formats of the templates and guides, and possibly an online community to trade information and experiences.

NOTES

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