



GSI INSPECTION & MAINTENANCE FIELD GUIDE

For Contractors in the Field

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SERVICE LEVELS OF PERFORMANCE STANDARDS



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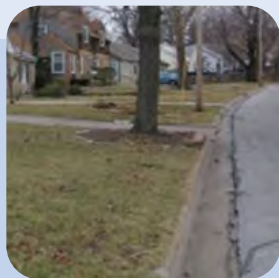
Appearance	Weeds, Pests, & Disease	Mulch & Erosion	Drainage
<ul style="list-style-type: none">• Healthy vegetation with tidy appearance• Clean, distinct planting bed edges• Litter/trash removed• Fallen/blown foliage removed (leaves, nuts, sticks, lawn clippings, fallen branches)• Little to no sediment or silt on surface• No cracking, settling, or damage of GSI components	<ul style="list-style-type: none">• Weeds are not acceptable, every effort should be made to control and eliminate all weeds• Pests or diseases that threaten vegetation should be removed with gentlest method possible. If problem is limited to less than 5% of plants, remove infected plants and replace with different species• Mosquito larvae removed	<ul style="list-style-type: none">• If applicable, mulch is evenly distributed, 2-inches to 4-inches deep• No evidence of erosion• Little to no sediment or silt on mulch surface• Finished grade location and elevation tolerances shall not exceed the following:<ul style="list-style-type: none">◆ Horizontal = 0.1 feet◆ Vertical = 0.1 feet	<ul style="list-style-type: none">• Zero ponding depth observed 48 hours following a rain event• Clear, open flow paths for water (inlet, outlet, overflow)

RATING INDICES



LITTER INDEX

Rating Guide



1. No Litter

- Virtually no litter
- Generally neat and tidy



2. Slightly Littered

- Small amount of litter
- It may take a few people a little bit of time to pick up the litter



3. Littered

- It may take a group of people some time to pick up the litter
- Considerable effort to clean



4. Extremely Littered

- Continuous amount of litter
- It may take a group a lot of time and equipment to pick up the litter

APPEARANCE INDEX

Rating Guide



1. Excellent

- ◆ Healthy vegetation, excellent appearance
- ◆ No weedy species present



2. Good

- ◆ Mostly healthy vegetation, good appearance
- ◆ Occasional weedy species (5-10%)



3. Moderate

- ◆ Mostly healthy vegetation, neglected appearance
- ◆ Lots of weedy species (10-20%)



4. Poor Effort

- ◆ Unhealthy vegetation, neglected appearance
- ◆ Weedy species predominate (more than 20%)

FUNCTION INDEX

Rating Guide



1. Excellent

- ◆ No erosion or bare spots, sediment, or flow obstructions



2. Good

- ◆ Some erosion and bare spots (0-5%)
- ◆ Some sediment and some flow obstructions



3. Moderate

- ◆ Erosion and bare spots (5-10%)
- ◆ Significant build-up of sediment, some flow obstructions



4. Poor Effort

- ◆ Substantial erosion and bare spots (more than 10%)
- ◆ Significant build-up sediment, significant flow obstructions

MAINTENANCE COMPONENTS, TASKS & FREQUENCIES



GREEN INFRASTRUCTURE COMPONENTS



Inlets



Energy Dissipation & Pollutant Removal



Above Grade Barriers



Soil & Aggregate Media



Landscaping



Outlets

TYPICAL INSPECTION AND MAINTENANCE TASKS



- **Trash & Debris Removal**
- **Sediment Removal**
- **Clear Stormwater Flow Paths**
- **Inspect for Standing Water**
- **Repair Erosion & Material Settlement**
- **Inspect Structural Conditions**
- **Inspect Health & Appearance of Vegetation**
- **Pest & Disease Control**
- **Prune Plants**
- **Remove & Replace Dead Plants**
- **Invasive Species and Weed Removal**
- **Maintain Turf Grass Lawn**
- **Refresh Mulch Areas (as applicable)**

TRASH & DEBRIS REMOVAL

Frequency: Bi-Weekly

- Trash and debris may impede flow of stormwater to inlets or outlets
- Remove by hand or with lightweight equipment (litter pickers)
- Larger buildups may need removed with special equipment
- Report observations of large dumped items such as furniture, tires, bags of trash, etc. to the City



SEDIMENT & DEBRIS REMOVAL

Frequency: Bi-Weekly

- Sediment may impede flow of stormwater to inlets or outlets
- Use a shovel to remove sediment buildup or blockages
- Replace any surface materials that were removed during sediment removal
- Clean or replace filter bag/basket in inlet, outlet, and pretreatment structures



CLEAR STORMWATER FLOW PATHS

Frequency: Monthly

- Stiff broom inlet structures and at least twenty feet of curb/gutter upstream of inlet structures



INSPECT FOR STANDING WATER

Frequency: Monthly

- During every site visit, inspect for standing water and mosquito larvae
- Inspect site 48-hours after a large rainfall event of 3-inches or more in a 24-hour period



REPAIR EROSION & MATERIAL

Frequency: As Needed

- Inspect basin for erosion gullies or signs of soil, aggregate, or mulch displacement
- Replace and stabilize surface material as needed to bring to original grade
- Report excessive erosion causing structural failures (i.e., near inlet, outlet, or weir structures, etc.)
- Notify the City if erosion continues to occur in the same area



INSPECT STRUCTURAL CONDITIONS

Frequency: Monthly

- Report to the City any observation of:
 - ◆ Damaged or broken concrete curbing
 - ◆ Uneven or sinking pavement or curbing
 - ◆ Loose or damaged bollards or fencing
 - ◆ Loose or damaged inlet structures, outlet structures and/or grates
 - ◆ Damaged or sinking weirs
- Maintenance contractor is NOT responsible for structural repairs



INSPECT HEALTH & APPEARANCE OF VEGETATION

Frequency: Weekly

- Vegetation should have a tidy appearance and landscape edging should be clean, distinct, and visible
- Inspect for signs of excessive drought, disease, nutrient deficiency, and/or pest problems
- Identify observed weeds or bare spots requiring mulch or vegetation replacement



PEST & DISEASE CONTROL

Frequency: Monthly

- Report any observation of animal burrows larger than 1-inch to the City
- Identify pests and disease species to determine appropriate method of removal
- All chemical controls must be applied by a Missouri-State Certified Applicator
- Install mosquito dunks per manufacturer's recommendations in location of observed mosquito larvae



PRUNE PLANTS

Frequency: As Needed

- If plants are covering landscape edges, streets, or surrounding pavement use hand pruning shears to properly prune plants
- Perennials and Grasses:
 - ◆ In early March, cut back foliage to 3”-6” above the root crown and remove all cuttings from site
 - ◆ Depending on species, some plants may need dividing or thinning every 3-5 years to prevent overcrowding and encourage air circulation between individual plants



PRUNE PLANTS

Frequency: As Needed

- Shrubs:
 - ◆ Remove only damaged, dying or dead branches
 - ◆ Prune to maintain natural character/form, do not prune into balled or boxed forms except for where specifically instructed
- Tree pruning must be performed by a certified arborist
- NEVER use a string-line trimmer or mower to prune plants



REMOVE & REPLACE DEAD PLANTS

Frequency: As Needed

- Photograph and record locations for trees, shrubs and plants that are more than 75% dead and submit a Work Order to the City for plant removal and replacement.
- Replacement Planting Process:
 - ◆ Install nursery grown plants in April or September to minimize heat stress to plants
 - ◆ Dig planting pit two times wider than the rootball
 - ◆ Add soil amendments to the planting pit as necessary
 - ◆ Backfill around rootball in layers, tamping soil to eliminate voids and air pockets
 - ◆ Water newly installed plants to completely saturate soil to a 4-inch depth weekly until the first freeze of the planting season occurs



INVASIVE SPECIES & WEED REMOVAL

Frequency: Monthly

- Maintain GSI Components so they are free of weeds at ALL times
- Refer to original planting plans to understand what plants should remain
- Identify type of weed species to determine the appropriate method of removal
- Apply pre-emergent herbicide granules per manufacturer's recommendations. Document application with photographs and provide date completed
- Consult the City for direction prior to removing plants that were not originally installed but are identified as beneficial plants



INVASIVE SPECIES & WEED REMOVAL

Frequency: Monthly

- If chemical methods for weed control are needed, only use methods approved by the City and listed in the GSI Inspection and Maintenance Field Guide
- Blue marker dye is recommended in all liquid chemicals before use
- Do not apply chemicals within 24-hours of a forecasted rain event
- Any person applying chemicals must be a Missouri-State Certified Applicator



MAINTAIN TURF GRASS LAWN

Frequency: Weekly

- Use a string-line trimmer to manage turf along landscape edges, streets, or surrounding pavement
- Mow turf grass lawn areas to a height of 3 to 5 inches
- Broom or blow resulting grass clippings into the mowed grass area. DO NOT leave clippings on paved, gravel, or mulched surfaces
- DO NOT mow non-lawn vegetation within the GSI footprint. If mowing extents are unclear, request written verification from the City



REFRESH MULCHED AREAS (AS APPLICABLE)

Frequency: Semi-Annually

- Rake displaced mulch
- Remove mulch from tops and sides of inlets, outlets, or pretreatment structures
- If applicable, add double ground hardwood mulch to landscape areas to maintain a 3-inch depth
- Mulch can be added year-round (but recommended at end of Spring)
- DO NOT place mulch within 2-inches of plants and 4-inches of tree trunks



WEED REMOVAL



WEED REMOVAL

There are two types of weeds:



Invasive Weeds: Invasive, non-native plants that have been designated aggressive and harmful to crops, natural habitats, humans, ecosystems, and livestock by a governing authority



Undesirable Weeds: Non-native, unsightly and aggressively growing plant species

Life Cycle of Plants:

Annuals:

A non-woody plant that completes its life cycle within one growing season, from germination to seed production

Biennials:

A non-woody plant that takes 2 years to complete its life cycle. Primary growth occurs during the first year and flowers during the next year

Deciduous Plant:

A deciduous plant produces wood as its structural tissue and thus has a hard stem, its buds are above ground and survive through winter

Perennials:

A non-woody plant that lives more than 2 years and gets stronger year after year

WEED REMOVAL

Typical Removal Methods:

Small Area Removal:

1. Before flowering occurs, use hand-held clippers to cut back stems to the soil level and remove all cuttings.
2. For most perennial weeds species, carefully apply herbicide to remaining stems to kill the root system. DO NOT broadcast spray herbicide near desirable plants.

Large Area Removal:

1. Before flowering occurs, use hand-held shears (or a string-line trimmer when approved by the City) to cut back undesirable plants to the soil level and remove all cuttings.
2. For most perennial weed species, carefully spray herbicide on remaining stems to kill the root system.



COMMON INVASIVE WEEDS

Cutleaf Teasel (Biennial)



Description: Leaves and stems are prickly and deeply lobed with bases that fuse to form a cup around the stem. Dense white flowers on cone-shaped heads bloom for only one day. After flowering, the plant becomes woody and persists through the following winter.

Height: Spends at least the first year after germination as a basal rosette, then grows a 2 ft. to 8 ft. flowering stem in the second year.

Bloom Date: July-September

Management: For small areas, young rosettes can be dug up using a dandelion digger. However, taproots are difficult to remove. DO NOT cut stems prior to flowering because the plants will re-sprout and flower again. When flowering occurs, cut back stems slightly below ground level, remove cuttings, and apply herbicide to remaining foliage.

Common Teasel (Biennial)



Description: Oblong leaves can grow up to 12-inches long and have a large, white mid-vein covered in spines. Dense lavender color flowers on egg-shaped heads bloom for only one day. After flowering, the plant becomes woody and persists through the following winter.

Height: Spends at least the first year after germination as a basal rosette, then grows a 2 ft. to 8 ft. flowering stem in the second year.

Bloom Date: June-October

Management: For small areas, young rosettes can be dug up using a dandelion digger. However, taproots are difficult to remove. DO NOT cut stems prior to flowering because the plants will re-sprout and flower again. When flowering occurs, cut back stems slightly below ground level, remove cuttings, and apply herbicide to remaining foliage.

COMMON INVASIVE WEEDS



Musk Thistle (Biennial)



Description: Deeply lobed leaves with a spiky edge and smooth/waxy surface can grow up to 10-inches long. Large, bright pink/purple flower heads are almost 3-inches wide.

Height: Spends at least the first year after germination as a basal rosette, then grows a 6 ft. flowering stem in the second year.

Bloom Date: May-September

Management: Before flowering occurs, use a sharpened shovel to cut back stems to the ground and insure that lateral and terminal buds on the root crown are destroyed. Remove cuttings and apply herbicide to remaining foliage.

Garlic Mustard (Biennial)



Description: Grows as a rosette in the first year with heart-shaped leaves and no flowers. In the second year, leaves are serrated with deep veins and the flowers are small clusters of light purple 4-petal flowers. Prefers growing in shaded areas and emits a strong garlic smell when the leaves are crushed.

Height: Spends at least the first year after germination as a basal rosette, then grows a 2 ft. to 4 ft. flowering stem in the second year.

Bloom Date: May-June

Management: Has taproots but does not regenerate from root fragments and is one of the few weed species that should be hand-pulled.



COMMON INVASIVE WEEDS

Johnson Grass (Perennial)



Description: Has 6-inch to 20-inch long leaf blades without hairs and a prominent white mid-vein. Large, open panicle seed heads are loosely branched with a purplish tint which turn dark red at maturity.

Height: 2 ft. to 6 ft.

Bloom Date: June-November

Management: Rapidly reproduces from rhizomes and seeds. Dense patches can be controlled by carefully spraying the foliage with a 2% Roundup (a formulation of glyphosate) when plants are 18-inches tall and in the early flowering stage. During this period, the herbicide will most effectively weaken the roots and rhizomes. Since Roundup is a non-selective herbicide, extreme care should be taken to avoid spraying non-target plants.

Clover (Perennial)



Description: Short stems consist of three small petal shaped leaves with a “v” on each leaf. Depending on the species, flower colors may be yellow, white, red, or purple.

Height: Generally grows low to the ground

Bloom Date: June-September

Management: In the Spring, spray foliage with selective post-emergent herbicide.

COMMON INVASIVE WEEDS



Crown Vetch (Perennial)



Description: Distinctive creeping stems with 15-25 pairs of oblong dark green leaflets and pea-like pink and white crown-shaped flower clusters.

Height: Generally grows low to the ground, up to 6 ft. in length

Bloom Date: May-August

Management: Has an aggressive rhizomatic root system. Spot-spray foliage with herbicide in early Spring before flowering.

Field Bindweed (Perennial Vine)



Description: Creeping, twining vine with an extensive rhizomatic root system that climbs and wraps around other plant stems. Has arrowhead shaped leaves with white or pink bell-shaped flowers.

Height: Can climb up to 12 ft. in length

Bloom Date: June-August

Management: Cut back stems to the soil level, remove the cuttings, and apply herbicide to remaining foliage.



COMMON INVASIVE WEEDS

Sericea Lespedeza (Perennial)



Description: Produces a chemical which stunts the growth of surrounding plants. Has a deep taproot with herbaceous to somewhat woody stems, with many erect, leafy branches. Leaflets are long and skinny. Small clusters of flowers are cream colored with purple or pink markings.

Height: 3-6 ft.

Bloom Date: July-October

Management: The most effective and economical treatment is an herbicide combination of triclopyr and fluroxypyr (PastureGard) which can be applied throughout the growing season once plants are at least 12-inches tall (usually June 1 through September 30).

Purple Loosestrife (Perennial)



Description: Wetland plant with showy purple flowers and spikes. Flowers have 5-7 petals, and the leaves are opposite or in whorls of 3.

Height: 3-10 ft. (avg. 5 ft.)

Bloom Date: June-September

Management: Control large stands with herbicide. Small stands are better controlled by hand-pulling, making sure to pull as much of the root system as possible. If the plants are broken off at the soil surface, then the “root crown” will sprout new stems. Pull plants before they flower to avoid scattering seeds in the removal process.

COMMON INVASIVE WEEDS



Canada Thistle (Perennial)



Description: Emerges as a small rosette in Fall or Spring. Leaves are irregularly lobed, waxy, and spiny-toothed. Purple-pink flowers in a tear-drop shape emerge in the Summer. Seedheads change to white fluffy tips in mid-July.

Height: 2-5 ft.

Bloom Date: June-September

Management: Aggressive with vigorous root system. Cut back stems to soil level at least three times each season, in June, August, and September. Spot application of the amine formulation of 2,4-D according to label instructions can control this plant. Precautions should be taken to avoid contacting non-target plants with the solution.

Spotted Knapweed (Perennial)



Description: This plant produces chemical that inhibit the growth of surrounding plants. It has long taproots with gray-ish green foliage and small, oval, pink-purple flowers marked with dark upside-down “v” markings giving them a spotted appearance.

Height: 2-4 ft.

Bloom Date: June-October

Management: Prior to seeding, hand-pull or dig small patches, removing the entire crown and taproot to prevent re-growth. On large areas, spot-spray herbicide containing aminopyralid, such as Milestone, in the Spring before the plant flowers. Applying 2,4-D to rosettes in the Fall or early Spring is also effective. Read and follow all herbicide label directions.



COMMON INVASIVE WEEDS

Reed Canary Grass (Perennial)



Description: An aggressive, cool-season perennial grass that invades and dominates a variety of wetland types. Grass blades are flat and rough on the top and bottom. It has a very transparent membrane where the leaf blade attaches to the stem. Flowers are densely clustered single florets that can range in color from green to purple and typically fade to beige in late Summer or Fall.

Height: 2-6 ft.

Bloom Date: May-Mid-June

Management: Small areas can be hand pulled or dug with a shovel. For large areas, apply herbicides designed for use in wetlands (e.g. Rodeo) in early Spring when foliage is green and most native wetland species are still dormant.

Tree of Heaven (Deciduous tree)



Description: Rapidly growing deciduous tree with a flower that releases a strong, offensive smell. The leaves are made up of many smaller leaflets and may be mistaken for Walnut trees. The leaflets have smooth edges, two lobes at the base of the leaflet, and small stalk. It releases chemicals into the soil which is toxic to surrounding plants.

Height: Up to 90 ft.

Bloom Date: June

Management: Pull seedlings by hand before taproot develops. For large trees, apply systemic herbicides, which are taken up by plants and move within the plant, killing leaves, stems, and roots

COMMON INVASIVE WEEDS



Japanese Honeysuckle (Deciduous Vine)



Description: A climbing or sprawling, semi-evergreen woody vine that often retains its leaves into winter. Stems are flexible, hairy, pale reddish-brown, shedding in long papery strips to reveal straw-colored bark beneath. Its fragrant flowers are tubular and white, turning yellow in the Spring and produces black berries in the fall.

Height: 20 ft. spread

Bloom Date: May-June (Fruits: September-October)

Management: Cut stems at the base, remove cuttings, and immediately apply herbicide to remaining foliage. Because Japanese Honeysuckle is semi-evergreen, the best time for treatment with herbicides is when deciduous vegetation is dormant.

Shrub Honeysuckle (Deciduous shrub)



Description: Large, upright, spreading shrub with arching stems and fragrant, tubular flowers that change from white to yellow and produce juicy, red berries in the Fall. It leafs out early in the Spring and remains green after other woody species have lost their leaves in the Fall.

Height: 15-20 ft.

Bloom Date: May-June (Fruits: September-October)

Management: Cut stems at the base with brush-cutters, chainsaws, or hand tools. After cutting, a 20-percent solution of glyphosate should be applied to the cut stump either by spraying the stump with a low-pressure hand-held sprayer or wiping the herbicide on the stump with a sponge applicator to prevent re-sprouting.



COMMON UNDESIRABLE WEEDS

Crabgrass (Annual)



Description: A low-growing annual grass that typically grows in thin or bare spots. It has wide, flat, light green color blades and a pale, almost silvery mid-vein. The blades of the plant grow in a star-shaped pattern from a central point and produces long flower clusters and thousands of seeds.

Height: Grows low to the ground

Bloom Date: Summer

Management: Seed heads develop in late Summer to early Fall. For small areas, use a garden weeder to completely remove the clump and roots before seeds emerge. For larger areas, spot-spray clumps with a crabgrass specific post-emergent herbicide.

Giant Foxtail (Annual)



Description: Upright, light green color annual grass with long, thin, and ovular leaf blades that have many short hairs on the upper surface. It has green-purple seed heads which are bristly, spike-like panicles that droop and resemble a fox's tail.

Height: 3-4 ft.

Bloom Date: Late Summer to Early Fall

Management: Before seed heads emerge, cut stems at the base, remove cuttings, and immediately apply herbicide to remaining foliage.

COMMON UNDESIRABLE WEEDS



Barnyard Grass (Annual)



Description: Stems grow outward first before growing upward. Leaves are long, skinny, and rolled at the shoot. The outer stem layer toward the base is usually smooth and maroon in color. Has a distinctively bulky flowering/seeding head, with close-set spikes of flowers that grow in a herringbone pattern.

Height: Up to 5 ft.

Bloom Date: July-September

Management: For small areas, use a garden weeder or shovel to completely remove the clump and roots before seeds emerge. For larger areas, cut stems at the base, remove cuttings, and immediately apply herbicide to remaining foliage.

Giant Ragweed (Annual)



Description: Distinctive, deeply lobed leaves with a drooping cluster of flower spikes.

Height: Up to 12 ft.

Bloom Date: July-September

Management: Before seed heads emerge, cut stems at the base, remove cuttings, and immediately apply herbicide to remaining foliage.



COMMON UNDESIRABLE WEEDS

Cattail (Perennial)



Description: Tall wetland plants with narrow, upright leaves emerging from a thick base, and a central stalk bearing a brown, sausage-shaped flower spike.

Height: Up to 8 ft.

Bloom Date: May-July

Management: Spreads from thick, fleshy rhizomes and from the thousands of fluffy seeds released when the flower spike disintegrates. For temporary control, consistently dig up or cut back stalks with a string-line trimmer so plants are never allowed to grow more than a foot tall or produce seeds. Apply herbicides designed for use in wetlands (e.g. Rodeo) when plants are actively growing (typically mid-May through late-June).

Nutsedge (Perennial)



Description: Leaves are distinctly stiff, glossy, and yellow-ish green. Umbrella-shaped clusters of yellow or purple flower spikelets grow at the ends of flowering stems.

Height: Up to 3 ft.

Bloom Date: June-September

Management: NEVER pull nutsedge because it grows from tiny tubers that form on roots. When roots are pulled, some tubers will stay behind to grow. The most effective tool is to carefully apply post-emergent herbicides (e.g. Sedgehammer) to leaves when it's actively growing.

COMMON UNDESIRABLE WEEDS



Dandelion (Perennial)



Description: Have deep taproots and deeply lobed leaves with bright yellow flowers and fluffy, ball-shaped seedheads.

Height: Up to 2 ft.

Bloom Date: May-October

Management: Produces a deep taproot and buds grow from the uppermost area of the root, producing a crown that can regenerate “new” plants even when the plant is cut off at or below the soil surface. The most effective treatment is to carefully spot-spray foliage with post-emergent herbicide.



POTENTIAL INVASIVE WEEDS

Scotch Thistle (Biennial)



Description: Stems are sharp with spiny tips. The leaves can grow up to 3 feet long and are wide with short, spiny lobes and fine woolly hairs that make the plant look blue-gray. Pink/purple globe-shaped flower heads are an inch in diameter.

Height: Up to 12 ft.

Bloom Date: Mid-Summer

Management: Aggressive with vigorous root system. Cut back stems to soil level at least three times each season, in June, August, and September. Spot application of the amine formulation of 2,4-D according to label instructions can control this plant. Precautions should be taken to avoid contacting non-target plants with the solution.

Multiflora Rose (Perennial)



Description: A medium-sized, thorny shrub with a spreading growth form, often forming thickets. Each leaflet is broadly oval and toothed along the edge. Flowers are clustered with white heart-shaped petals.

Height: Up to 15 ft.

Bloom Date: May-June

Management: Cutting stems and either painting herbicide on the stump with a sponge applicator or spraying herbicide on the stump with a low pressure hand-held sprayer kills root systems and prevents re-sprouting. With this technique, herbicide is applied specifically to the target plant, reducing the possibilities of damaging nearby, desirable vegetation.

POTENTIAL INVASIVE WEEDS



Kudzu (Perennial Vine)



Description: An aggressive, semi-woody, vine with uncontrollable, smothering growth. Its hairy vines trail, sprawl, and loosely twine from a large, central root crown. The leaves are in groups of three and are hairy underneath. The flowers are pea-like, purple, grape-scented, and grow in elongated clusters.

Height: Up to 100 ft. in length

Bloom Date: July-September

Management: Many herbicides will kill back the stems and leaves of Kudzu; however, most will not provide eradication by killing of the root systems. Cut back foliage below the root crown and apply non-selective herbicides (e.g. Roundup or Rodeo) to remaining stems.

Japanese Knotweed (Perennial)



Description: Heart-shaped leaves, pointed at tip with sheath-like coverings and reddish, hollow, jointed stems that resemble bamboo. Flowers are white to greenish and produced in long spikes that arise where leaves join the stems or at the ends of the stems. Seeds are small, winged, and are formed by August and September.

Height: 3-12 ft.

Bloom Date: July-September

Management: Manual control is not an effective treatment due to its substantial root system. Apply a foliar spray prior to seed formation in early Summer and in the Fall, often as a re-treatment. Or, cut back individual stems 2 to 3 inches above the soil and apply a 25% triclopyr or glyphosate herbicide solution to the cut stem immediately.



POTENTIAL INVASIVE WEEDS

Henbit (Annual)



Description: A branching, soft, weedy plant with square stems. Flowers are small, tubular-shaped and bright lavender with red spots. Leaves are rounded, scalloped, and close to the ground.

Height: 6 in.-15 in.

Bloom Date: April-October

Management: For small areas, use a garden weeder or shovel to completely remove the clump and roots before seeds emerge. For larger areas, cut stems at the base, remove cuttings, and immediately apply herbicide to remaining foliage.

Pigweed (Annual)



Description: Upright with oval to diamond-shaped leaves. Most leaf margins are usually wavy, slightly lobed, or slightly toothed. Leaf texture varies from thin to thickened and somewhat leathery to slightly succulent. Flowers are short, green spikes and do not mature at the same time.

Height: Up to 7 ft.

Bloom Date: May-October

Management: For small areas, use a garden weeder or shovel to completely remove the clump and roots before seeds emerge. For larger areas, cut stems at the base, remove cuttings, and immediately apply herbicide to remaining foliage.

POTENTIAL INVASIVE WEEDS



Velvet Leaf (Annual)



Description: Upright, stout, branched stems are covered with very soft, velvety hairs. Leaves are large and heart-shaped with pointed tips and prominent veins radiate from the point of leaf stalk attachment. Leaf and stem tissue give off a distinctive odor when crushed. The flowers are yellow to yellow-orange and have five small petals. The root system is a shallow, branching, white taproot.

Height: Up to 7 ft.

Bloom Date: July-September

Management: For small areas, use a garden weeder or shovel to completely remove the plant and roots before seeds emerge. For larger areas, cut stems at the base, remove cuttings, and immediately apply herbicide to remaining foliage.

Prickly Lettuce (Biennial)



Description: The woody stems of this plant are hollow, and form in the middle of a basal rosette of leaves. Leaves are deeply lobed, and clasp the base of the stem. The leaf shape is distinctive, with the indentation between lobes forming a “C” shape. Leaves are also oriented at an angle to the stem, with spines on the midrib and base of the leaf. Has yellow flowers, but these can appear to be white from a distance due to the woolly hairs on each seed.

Height: Up to 7 ft.

Bloom Date: April-October

Management: For small areas, use a garden weeder or shovel to completely remove the plant and roots before seeds emerge. For larger areas, cut stems at the base, remove cuttings, and immediately apply herbicide to remaining foliage.

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BENEFICIAL PLANT IDENTIFICATION



BENEFICIAL PLANTS IDENTIFICATION

There are three categories of beneficial plants found in this guide:

Native Grasses, Sedges, and Herbaceous Perennials.

Native Grasses:

Native grasses are warm season plants that green up early to mid summer and produce seed heads summer into fall. These plants require cutting back in late winter of early spring.

Sedges:

Native sedges are a perennial grass-like cool season plant, with the leaves of the plant have distinct edges. These plants do not require cutting back in the spring, and most typically spread via rhizome to create a mass.

Herbaceous Perennials:

A non-woody plant that lives more than 2 years and gets stronger year after year. These plants produce showy flowers and may require division

NATIVE GRASS IDENTIFICATION

Sideoats Grama (*Bouteloua curtipendula*)



Height: 2-3 ft.

Bloom Date: j f m a m j j a s o n d

Blue Grama (*Bouteloua gracilis*)

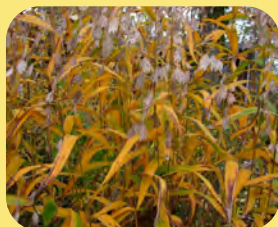


Height: 3 ft.

Bloom Date: j f m a m j j a s o n d

NATIVE GRASS IDENTIFICATION

Northern Sea Oats (*Chasmanthium latifolium*)



Height: 4 ft.

Bloom Date: j f m a m **j j a s** o n d

Feather Reed Grass (*Calamagrostis x acutiflora*)



Height: 5 ft.

Bloom Date: j f m a **m j j a s o n d**

NATIVE GRASS IDENTIFICATION

Switchgrass (*Panicum virgatum*)



Height: 4-5 ft.

Bloom Date:

j f m a m j j a s o n d

Little Bluestem (*Schizachyrium scoparium*)



Height: 2-4 ft.

Bloom Date:

j f m a m j j a s o n d

NATIVE GRASS IDENTIFICATION

Indiangrass (*Sorghastrum nutans*)



Height: 5-7 ft.

Bloom Date: j f m a m j j **a s** o n d

Prairie Dropseed (*Sporobolus heterolepis*)



Height: 2-3 ft.

Bloom Date: j f m a m j j **a s** o n d

NATIVE GRASS IDENTIFICATION

Autumn Moor Grass (*Sesleria autumnalis*)



Height: 2 ft.

Bloom Date:

j f m a m j j a s o n d

COMMON SEDGE IDENTIFICATION



Carex albicans



Carex amphibola



Carex brevior



Carex pensylvanica



Carex bicknellii



Carex blanda



Carex pensylvanica



Carex stricta

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