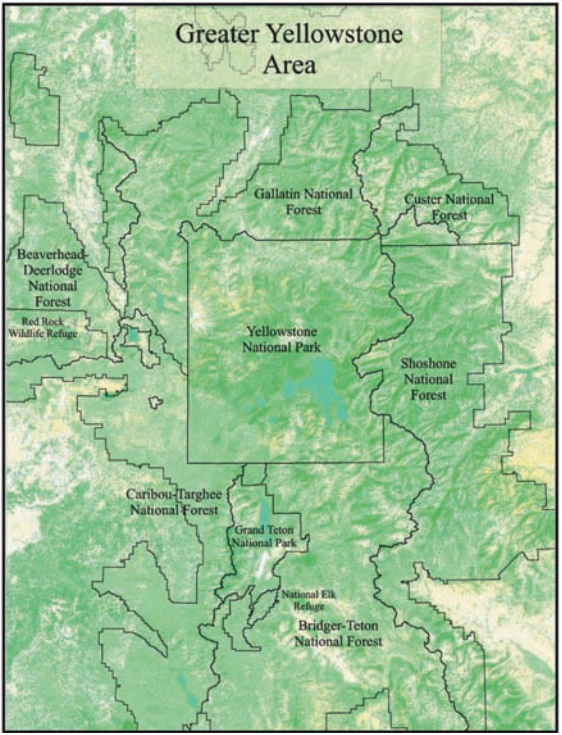
The Greater Yellowstone Coordinating Committee

WEED POCKET GUIDE



Weed Awareness

This guide serves as a basic primer for weed awareness, detection, prevention, and ecology. Share your knowledge with visitors, co-workers, contractors, and others. Be aware of how your actions or the actions of others can help spread noxious weeds. Plan and implement your work with weed prevention in mind.

Welcome to the Greater Yellowstone Coordinating Committee

The Greater Yellowstone Coordinating Committee consists of the federal land managers from Yellowstone and Grand Teton National Parks, the Beaverhead-Deerlodge, Bridger-Teton, Caribou-Targhee, Custer, Gallatin and Shoshone National Forests, and the National Elk Refuge and the Red Rock Lake Refuge. The managers of these units identified noxious weeds as one of the top management priorities for the Greater Yellowstone Area.

"The GYA Weed Committee includes invasive species coordinators from each GYA unit, county weed and pest staff, BLM and other state, county and federal weed managers who work together on common inventories, establishment of cooperative weed management areas, development of best management practices, creation of education and information materials and integrated management to manage and prevent the spread of noxious weeds."

"Transcending Boundaries in one of America's Most Treasured Ecosystems"

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Introduction

We are fortunate to be able to live, work and play in one of America's most treasured areas – the Greater Yellowstone. Noted for its abundant wildlife, clean water and diverse and largely undeveloped natural landscapes, the natural vegetation communities that evolved here are the basic fabric that hold the ecosystem together.

These natural vegetation communities are threatened by non-native, introduced species referred to as noxious weeds. Noxious weeds are those plants not native to a region which, when introduced either accidentally or intentionally, out-compete native plants for available resources, reproduce prolifically, and potentially dominate regions and ecosystems. Because they often arrive in new areas unaccompanied by their native predators, invasive species can be difficult to control. Left unchecked, many noxious weeds have the potential to transform entire ecosystems as native species and those that depend on them for food, shelter, and habitat, disappear.

The threats are real. Already numerous weeds are established in parts of the Greater Yellowstone Area, and new species are discovered almost every year.

Imagine, the northern winter range, home to one of the largest free-ranging elk herd in North America, dominated by unpalatable noxious weeds. Already Dalmatian toadflax occupies nearly 6,000 acres of the northern winter range in

Yellowstone National Park and is now moving north on the Gallatin National Forest.

Envision the banks of the Firehole or Henry's Fork River choked with leafy spurge. Over 2,500 acres of the Island Park Ranger District are infested with leafy spurge.

What if the winter range on the Shoshone National Forest, home to the largest bighorn sheep herds in North America, is overtaken with dalmatian toadflax? Dalmatian toadflax increased from four acres in 1985 to over 2,000 acres in 1997 on winter range within the South Fork Shoshone drainage.

Picture the foreground of one of America's most spectacular views, the Grand Tetons, spoiled by non-native plants. Several new invaders recently discovered in Grand Teton National Park include meadow hawkweed, sulfur cinquefoil, Dyer's woad, Russian knapweed, and perennial pepperweed.

These examples may seem like a lesson in history. However, we have just begun to see the scope of the massive degradation that will occur in the future – if we allow that to happen. Weeds typically increase exponentially, beginning slowly then doubling and redoubling.

The Greater Yellowstone is too precious for noxious weeds. It will take a concerted and continuous effort by those who work and play here to help protect the natural vegetation communities and the species that depend upon these communities from the threats posed by these invaders.

What You Can Do

The national parks, national forests and national wildlife refuges in the Greater Yellowstone Area are actively engaged in noxious weed management including inventory, prevention, education, and manual, chemical and biological control efforts. Federal land management agencies are working closely with states, counties, weed management areas and many partners to coordinate efforts. That may not be enough! It will require the assistance of employees, coop-erators, contractors, visitors, and others to help protect and ensure the long-term natural integrity of this area.

There's over 14 million acres of federal land in the Greater Yellowstone Area. Nearly 80% of this land is either roadless or designated wilderness. Millions of visitors from every part of the country and much of the world travel to this area every year. With such a large area to watch over, and with multiple avenues for introduction from visitors, contractors, workers, vehicles, stock, and natural vectors like wind and wildlife, our weed managers need help with preventing the introduction of new weeds and with identifying new infestations.

Here's how you can help…

Prevention

The first line of defense is prevention. Often, the most cost-effective approach to combating invasive species is to keep them from becoming established in the first place. Units have adopted prevention measures, referred to as best management practices, to help reduce the risk of new weed introduction through management activities. Be familiar with your unit's best management practices and apply them as you do your work.

WEED PREVENTION STRATEGIES

The goals are to:

1. Protect areas that are currently not infested with weeds;
2. Contain and reduce established weed populations and prevent spread to uninfested sites;
3. Restore, establish, and/or maintain healthy native plant communities.

PREVENT ESTABLISHMENT/SPREAD

- Prevent transportation of seeds by motor vehicles. Keep vehicles on roads and trails designated for such use. Avoid driving through infested areas.
- Prevent transportation of seeds by pack and saddle animals.
    a. "Flush and Brush"– contain animals for 3-4 days to allow pass-through of weed seeds, and brush all animals to remove weed seed.
    b. Carry/use only weed-seed-free forage.
    c. Closely inspect trailheads, trails and backcountry campsites for noxious weeds.
- Prevent transportation of seeds by hikers, mountain bikers, backpackers.
    a. Inspect and clean shoes/boots, packs, equipment, bike tires etc.
    b. Keep dogs or other pets free of weed seed.

- For road construction material sites, sand and gravel pits, and other material source sites:
    a. Have approved weed management plans in place with counties, contractors and the states;
    b. Inspect and certify all gravel and fill sources as noxious weed free prior to using;
    c. Develop best management practices for all new pits and material source sites;
    d. Use only weed-seed-free compost and mulch material.
- Ensure that government work crews, contractors and permittees follow weed prevention best management practices:
    a. Develop weed-seed-free equipment policy, procedures and certification.
    b. Develop weed-seed-free construction material policy and procedure to include gravel, landscaping material, building materials, and straw or mulch for erosion control.
    c. Clean equipment before moving to a new area.
- Be aware of and apply best management practices for specific management activities including vegetation management, prescribed burning and range management.

SOIL DISTURBANCE AND REVEGETATION

- Minimize soil disturbance from activities.
- Re-establish self-sustaining native or desirable non-native plant communities on sites disturbed by management activities including noxious weed control.
- Use weed-free mulch and erosion control materials.

PROJECT DESIGN AND NEPA

- Incorporate noxious weed prevention into all project layout, design, alternative evaluation and monitoring. Be familiar with best management practices and areas of high risk for weed invasion for your unit.

Detection

Report new weed infestations or suspicious looking plants to your area weed coordinator listed in the back of this guide. This guide helps identify the major species of concern already established in the ecosystem as well as several species poised to invade. Your weed coordinator maintains an inventory map for your area. With limited weed crews and budgets and a large land base to cover, we need your help!

Be on the alert in high risk areas!

While you may encounter weeds across the ecosystem, be particularly observant in the following settings:

- Travel corridors-roads and trails are often the first point of establishment for many weeds.
- Concentrated recreation areas-parking lots, trailheads, campgrounds, visitor centers.
- Disturbed sites – recently burned areas, logged areas, construction sites, heavily grazed areas, mining sites, gravel pits, road and trail construction.
- Backcountry and wilderness campsites, particularly where stock is used.
- Warmer, drier habitat types with light tree cover.
- Areas adjacent to or near existing infestations.

Landowner Quick Reference to Noxious Weed Control

Integrated Weed Management (IWM) -using all available tools to target different aspects of a plants biology for increased control

Prevention!

Mechanical -effective only on single plants or small infestations-includes hand pulling to remove entire root-wear gloves, removing flowers to prevent seeds, mowing ONLY to reduce seeds. Dispose of plant parts in a plastic bag.

Chemical -use of herbicides

Cultural-Reseeding/Revegetation is an important component of IWM along w/other practices

These are generalized control options only. Your situation is unique. Please call your local Weed & Pest District for more information! See page 64 for a list of phone numbers.

Weed Identification

Identifying weeds is important for early detection and eradication of new weed infestations, containment of existing infestations, prevention of weed spread, and implemention of weed management and monitoring programs.

When collecting unknown plants, always collect as much of the plant as possible. This includes digging the root, collecting basal leaves, flowering stalks and stems, and any flowers, fruits and seeds from the plant or other identical plants in the area. It is also helpful to collect more than one flower. Plants should be placed in a plastic bag, kept cool, and sent for identification as soon as possible. Recording location and site information on the bag can aid in identification – for example, the date and area collected, elevation, slope, aspect, and the type of plant community where it was collected. Plant specimens can be brought to unit coordinators, botanists, or ecologists.

For each weed, we have noted whether pulling the plant or the flowers is appropriate, and whether the plant is considered toxic.

Common tansy

Tanacetum vulgare

Growth habit: The stems are often purplish-red and grow 1 to 6 feet tall.

Leaves: Leaves are deeply divided into leaflets with toothed margins.

Stems: On the stem, leaves are alternate and hardly vary in size.

Flowers: Yellow-orange, button-like flower heads which lack long petals (ray petals) are numerous (20-100) in flat-topped, dense clusters on the terminal stem.

Other: The yellowish-brown seeds have five-toothed ridges.

Current distribution: Found in small patches across most GYA units.

Interesting facts: Common tansy, originally from Europe, was introduced to the United States for its ornamental and medicinal qualities and has escaped cultivation.

Dalmatian toadflax

Linaria dalmatica

Growth habit: The robust stems grow to 3 feet tall with the flowers developing at the base of the upper leaves.

Leaves: Heart-shaped leaves are alternately arranged on the stem, have smooth edges, and clasp around the stem.

Stems: Leaves and stems are waxy and a whitish to bluish shade of green.

Flowers: The snapdragon-like flowers are bright yellow, have an orange throat and a long spur.

Other: Irregular angled seeds are produced in the 2-celled capsule.

Habitat preferences: Primarily occurs on sandy or gravelly soil on roadsides, railroads, pastures, cultivated fields, rangelands, and clearcuts. Toadflax can adapt their growth to fit a range of habitats, and have a tolerance for low temperatures and coarse-textured soils.

Current distribution: Major infestations occur on the northern winter range on Yellowstone NP and the Gallatin NF, and on the Shoshone NF.

Interesting facts: Dalmatian toadflax was introduced as an ornamental from southeastern Europe and has escaped cultivation. Areas that have been recently disturbed by fire are susceptible to increased toadflax infestation.

Dyer's woad

Isatis tinctoria

Growth habit: Multi-branching stems are 1 to 4 feet in height.

Leaves: Bluish-green with a whitish vein on the upper surface, alternate along stem.

Stems: Multiple, erect stems.

Flowers: Flowers cluster on the upper portion of the stem creating a dense flat-topped inflorescence. The four yellow petals of an individual flower are arranged in a cross formation and are 1/8-inch long and wide.

Other: Flowers produce purplish-brown, teardrop-shaped seed pods which hang from small stalks.

Habitat preferences: Dyer's woad will establish in rocky soils with minimum water-holding capacity, and the highest threat of establishment is in rangelands, pastures and forest lands. In Idaho, it is found between 3,000 and 8,000 ft. in full sun, most often found on south-facing canyon slopes.

Current Distribution: Widely distributed on Caribou-Targhee, and established on Bridger-Teton. Small infestations on Gallatin, Grand Teton, Yellowstone and Red Rocks.

Interesting facts: Dyer's woad was first introduced to the United States from Europe during colonial times for making blue dye.

Leafy spurge

Euphorbia esula / Euphorbiaceae

Growth habit: Stems of leafy spurge are 1 to 3+ feet tall.

Leaves: Alternate, narrow, 1 to 4-inch-long simple leaves.

Stems: Both the stems and the leave contain a white, milky sap.

Flowers: The flowers are yellowish-green, small, and arranged in many small clusters containing 7 to 10 flowers. Although the flower is relatively inconspicuous, it is subtended by showy, heart-shaped yellow bracts which are often mistaken as the flower.

Other: Seeds are oblong, grayish to purple, and borne in a three-celled fruit.

Habitat preferences: Occurs primarily in disturbed and undisturbed sites such as abandoned cropland, pastures, rangelands, woodlands, prairies, roadsides, and wastelands. It is tolerant of a wide range of habitats and may occur in rich damp soils such as on the banks of streams or on extremely nutrient-poor, dry soils typified by the rangelands of the West. It is most aggressive in semi-arid situations where competition from associated species is less intense. For this reason, infestations generally occur and spread rapidly on dry hillsides, dry prairies, or rangelands.

Current distribution: Well established on the Caribou-Targhee and the Gallatin National Forests. Small infestations on other units.

Interesting facts: This native of Eurasia was brought to the United States in the early 1800's. It has a milky sap that most insects and animals find distasteful. The brownish-white rootstalks can reach depths of 14+ feet. Capsules containing the seeds burst open with force when ripe, propelling the seed and aiding in dispersal.

Marsh sowthistle

Sonchus arvensis

Growth habit: The stems, which can be 1-1/2 to 6 feet tall, branch only at the top of the plant.

Leaves: The alternate leaves are variable in size with prickly edges and pointed lobes.

Stems: Erect, hollow stems with bitter, milky juice.

Flowers: The bright yellow flowers occur in heads that can be 1-1/2 to 2 inches wide when in full bloom. The flowers, which have five small teeth across the outer end, open two to three hours after sunrise and close around noon. The bracts beneath the flower are green and bristly with sticky hairs.

Other: A plant may have 20 heads during the flowering season from June to September, but usually only a few flowers at the same time. The oblong, dark-reddish seeds have five lengthwise ribs and a tuft of white, silky, parachute-like hairs that can carry it in the wind.

Habitat preferences: While it is adapted to many soil types, marsh sowthistle seems to prefer low, fine-textured soils, especially loams. The plant does better under alkaline or neutral conditions than under acidic conditions. Marsh sowthistle is commonly found in cultivated fields (both grain and row crops), waste areas, meadows, sloughs, woods, lawns, roadsides, beaches, ditches, and river and lake shores.

Current distribution: Small infestations on the Bridger Teton NF and Grand Teton NP.

Interesting facts: The plant makes acceptable livestock feed and is excellent feed for rabbits and other foraging animals. In addition, the roasted roots have been used as a coffee additive or replacement, and the young leaves can be used in salads. The plant may have potential for use in oil or hydrocarbon production, since most of the latex is composed of oil. The plant is also a source of pentacyclic triterpenes, which may have use in the pharmaceutical industry.

Rush skeletonweed

Chondrilla juncea

Growth habit: The mature plant consists of dark green, nearly leafless flowering stem with many aerial branches, ranges from 1 to 4 feet tall.

Leaves: The stem and aerial branches support a few leaves, which are narrow and linear.

Stems: A distinguishing characteristic of rush skeletonweed is the downwardly bent, reddish, coarse hairs on the lower 4 to 6 inches of the stem.

Flowers: Yellow flower heads, approximately 3/4-inch in diameter, are scattered on the stems and branch tips. Flower heads may appear singly or in clusters of two to five.

Other: Seeds are light brown to black, ribbed, and have white bristles at one end that aid in wind dispersal.

Habitat preferences: Cultivated areas, rangelands.

Current distribution: Watch list – no infestations reported in GYA. Large infestations in west-central Idaho.

Interesting facts: Each rush skeletonweed plant can potentially produce 20,000 seeds.

St. Johnswort

Hypericum perforatum

Growth habit: St. Johnswort is a multi-stem plant with a deep taproot and lateral roots.

Leaves: Leaves are opposite on the stem, lack stalks and teeth, are 1 inch or less long, and are darker green above than below.

Stems: Stems can branch many times near the top and are densely leaved.

Flowers: Numerous 5-petaled, yellow flowers form flat-topped clusters on the terminal branches.

Other: The oval-shaped leaves have in-rolled edges and tiny transparent dots on the leaf surface which are apparent when held up to a light source.

Habitat preferences: It prefers poor soils and full sun, and can be found primarily in meadows, dry pastures, rangelands, roadsides, and empty fields. However, it has the capability to invade healthy rangelands.

Current distribution: Present in most units. Well established in Caribou-Targhee NF and Grand Teton NP.

Interesting facts: St. Johnswort, originally from Europe, contains a toxic substance which causes sun sensitivity in livestock, especially white-haired animals. Purported medicinal values include reducing inflammation and treating depression and insomnia.

Sulfur cinquefoil

Potentilla recta

Growth Habit: Several erect stems which can reach 1 to 3 feet in height.

Leaves: The leaves are palmately compound with 5 to 7 toothed leaflets which radiate from a center point. Relatively few leaves are attached to the base of the plant. Most of the leaves grow along the length of upright stems.

Stems: Conspicuous, pointed hairs protrude outward at right angles from the stem and leafstalks.

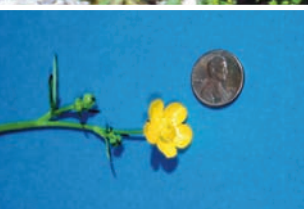
Flowers: Flower has five light yellow petals surrounding a dark yellow center.

Other: Three obvious characteristics distinguish sulfur cinquefoil from other cinquefoils. Leaves of sulfur cinquefoil appear green on the underside rather than silvery, sulfur cinquefoil's seeds are ridged while other cinquefoil's seeds usually are not, and sulfur cinquefoil has comparatively more stem leaves and fewer basal leaves than other *Potentilla* species.

Habitat preferences: The species is adapted to a wide range of environmental conditions. It occurs in open grasslands, shrubby areas, open forest and logged areas, roadsides, waste areas, and abandoned fields. In abandoned fields, sulfur cinquefoil occurs in the earliest stages of succession until woody cover is present; it also grows in forest margins, but it cannot survive under a full forest canopy.

Current distribution: Small infestations occur on Bridger-Teton, Custer, and Gallatin NF and Grand Teton and Yellowstone NPs.

Interesting facts: Because of its high tannin content, sulfur cinquefoil is unpalatable to most wildlife and livestock. In areas where sulfur cinquefoil grows with spotted knapweed, cattle will graze the knapweed over the cinquefoil.



Tall buttercup

Ranunculus acris

Growth habit: Tall buttercup is a perennial forb growing up to 3 feet in height.

Leaves: The hairy leaves are deeply lobed (nearly to the base) into 3 to 5 segments with each segment lobed again, giving the whole leaf a ragged appearance. Leaves decrease in size upward on the stem with the upper-most leaves reduced to 3 or 4 narrow segments.

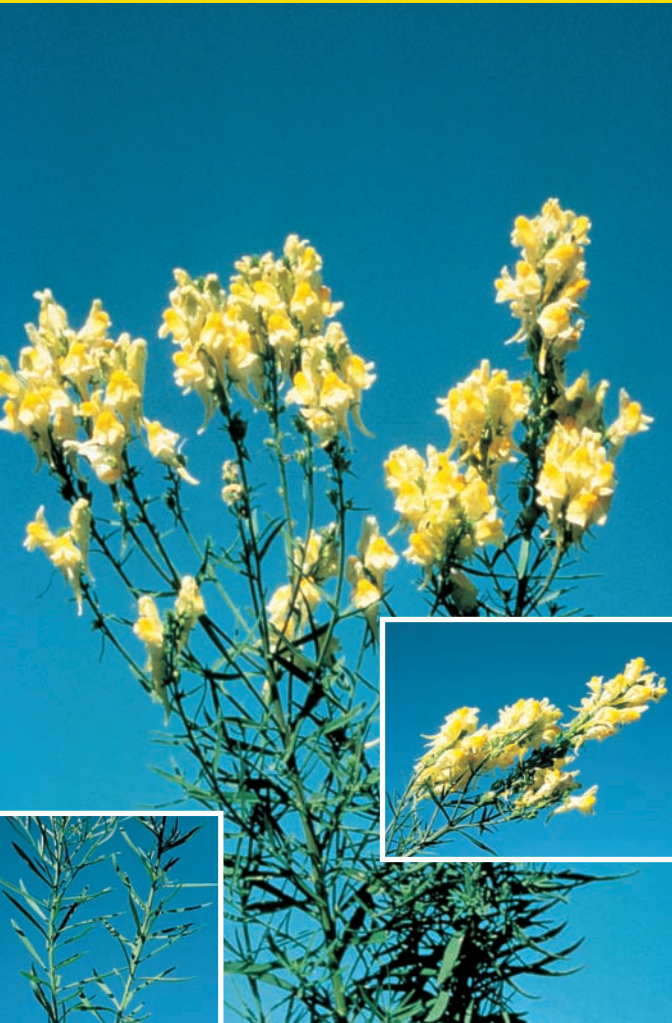
Stems: Branched, hairy stems.

Flowers: Single, glossy-yellow flowers in loose clusters. Flowers are 3/4 to 1 inch in diameter with a greenish center.

Habitat preferences: Buttercup species usually occur in meadows and pastures.

Current distribution: Small infestation discovered in Yellowstone NP.

Interesting facts: Tall buttercup, introduced from Europe, is poisonous to cattle.



Yellow toadflax

Linaria vulgaris

Growth habit: Yellow toadflax is smaller than Dalmatian toadflax and grows to be 1 to 2 feet tall.

Leaves: Yellow toadflax leaves are soft, linear or linear lanceolate, sessile, and pale green. They are generally 2 or more inches long.

Stems: Erect stems, sparingly branched.

Flowers: The flowers are similar to those of Dalmatian toadflax. Yellow toadflax flowers from May to August.

Other: Yellow toadflax seeds are flattened, winged and 1-2 mm long. A mature plant can produce up to 30,000 seeds annually.

Habitat preferences: Rapidly colonizes open sites. It is most commonly found along roadsides, fences, rangelands, croplands, clearcuts, and pastures. Disturbed or cultivated ground is a prime candidate for colonization.

Current distribution: Well established on the Caribou-Targhee and Gallatin NF, and Grand Teton and Yellowstone NPs.

Interesting facts: Yellow toadflax contains a glucoside that is mildly poisonous to livestock.

Yellow hawkweed

Hieracium pratense

Growth habit: Fibrous rooted perennial herb up to 12 inches tall.

Leaves: Smooth-based leaves with one or two small leaves on the bristly stem.

Stems: The largely leafless flowering stems range from 1 to 3 feet in height, with occasionally 1 to 3 small leaves present.

Flowers: Five to 30 yellow flower heads form a compact flat or rounded flower cluster.

Other: The plant contains a milky juice.

Habitat preferences: Woodlands, open timberlands, and dry open habitats.

Current distribution: Light infestations in Yellowstone and Grand Teton NPs.

Interesting facts: Grazed by sheep and goats, and fair forage for cattle and horses, and big game animals.

Yellow starthistle

Centaurea solstitialis

Growth habit: The rigid stems vary from 2 to 3 feet in height depending on environmental conditions.

Leaves: The leaves of the rosette are deeply lobed with a pointed tip, similar to a dandelion rosette.

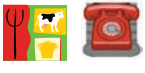
Stems: Stems stiff, openly branched from near or above the base or sometimes not branched in very small plants.

Flowers: Flower heads are yellow and singly located at the end of branches. Sharp, straw-colored spines up to 3/4 inch long radiate from the bracts.

Habitat preferences: Poor quality rangeland, edges of cropland, idle farmlands and pastures, roadsides, railways, and recreational areas. It is best adapted to open grasslands with deep, well-drained soils.

Current distribution: Watch list – currently no reports within GYA.

Interesting facts: Yellow starthistle, a native to Europe, can cause "chewing disease" if fed to horses.



Canada thistle

Cirsium arvense

Growth habit: The 1- to 4-foot-tall stems are slender, green, and freely branched. The heads are many and relatively small. The plants are dioecious (all flowers on a plant are either male or female).

Leaves: The leaves are alternate, sessile, and deeply lobed. The leaf margins have stiff yellowish spines.

Stems: Erect, grooved stems, branching at the top.

Flowers: The flowers are purple, pink or sometimes white.

Other: Deep-seated complex system of roots spreading horizontally which gives rise to new shoots.

Habitat preferences: Canada thistle is found in almost every plant community disturbed by humans. It is common to roadsides, railway embankments, lawns, gardens, abandoned fields, agricultural fields, margins of forests, and waterways. It grows poorly in shaded conditions and produces few flowers.

Current distribution: Widely distributed across GYA.

Interesting facts: Canada thistle is regarded as a good source of nectar and pollen for honeybees.The shoots and roots are consumed by some people in Russia.

Houndstongue

Cynoglossum officinale

Growth habit: Houndstongue is a biennial forb which forms a rosette in the first year of growth and produces a flowering stem the second year.

Leaves: The leaves are alternate and are hairy, rough, and lacking teeth or lobes.

Stems: Stems are erect, single, unbranched below the flowers, hairy and coarse.

Flowers: The flower is a dull reddish purple, about 3/8 inch wide and 5-lobed.

Other: The seeds of each houndstongue flower consist of 4 bur-like, adhesive nutlets about 1/3 inch long commonly referred to as "beggar's lice". The seeds do not have a plume or parachute.

Habitat preferences: Houndstongue is a shade-tolerant plant and thrives in wetter grasslands. Found on roadsides, meadows and disturbed places.

Current distribution: Established on all GYA units.

Interesting facts: Houndstongue, a native to Europe, contains a toxin which causes liver cells to stop reproducing.

Musk thistle

Carduus nutans

Growth habit: A robust thistle that, given the right conditions, may grow to 6 or 7 feet tall.

Leaves: The deeply lobed, spiny leaves are alternate on the stem.

Stems: The stems are spiny and winged except just below the flower heads.

Flowers: The large solitary flower heads at the ends of the stem are reddish purple. The flower heads droop at maturity. Each plant may have 50 to 100 flower heads with up to 1,000 seeds per head.

Other: Spreads rapidly forming extremely dense stands, crowding out desired forage.

Habitat preferences: Musk thistle is most prevalent in disturbed areas such as roadsides, grazed pastures and old fields, but can invade ungrazed pastures and native grasslands.

Current distribution: Well established on Bridger-Teton, Caribou-Targhee, Gallatin and Grand Teton. Present on other units.

Interesting facts: Native to southern Europe and western Asia. The Latin "nutans" describes the nodding head of this thistle.

Purple loosestrife

Lythrum salicaria

Growth habit: One plant can produce many stout, 6- to 10-foot-tall stems.

Leaves: The leaf shape is similar to that of a willow, which accounts for the Latin name *salicaria* which means willow-like.

Stems: The erect, hairy stems branch from above the middle or not at all. Stems are square or octagonal and may be hairy or smooth.

Flowers: Flowers are clustered on an elongate terminal spike and can extend 2 inches to 3 feet down the stem in long vertical clusters called racemes. One or more flowering branches may be present. Rose-purple flowers have 4 to 8 petals.

Other: Small brown capsules contain many seeds.

Habitat preferences: Purple loosestrife is found in wetlands such as cattail marshes, sedge meadows, and open bogs. Purple loosestrife also occurs along stream and river banks and lake shores. In addition, the plant is found in ditches and other disturbed wet soil areas.

Current distribution: Watch list – no reported infestations in GYA.

Interesting facts: Purple loosestrife is an extremely successful invader of wetlands that have been subjected to some type of disturbance: drawdown, siltation, drainage, ditching. Expansion in a wetland can be extensive and sudden due to the abundance of seeds produced and the rapid growth of seedlings

Russian knapweed

Acroptilon repens

Growth habit: A bushy, branched perennial, Russian knapweed grows 1- to 3-feet-tall and forms clones or colonies from its vigorous, spreading root system.

Leaves: Lower leaves are deeply lobed, 2 to 4 inches long. Narrow upper leaves are entire or serrated.

Stems: While young plants may have whitish and woolly stems, older plants will turn dark brown to black.

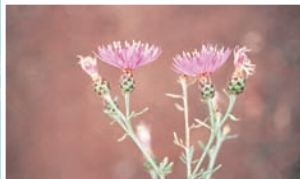
Flowers: The pink to purple flowers grow in solitary heads at the tips of leafy branches.

Other: Russian knapweed flowers from June to September, producing ivory-white seeds with a feather-like plume.

Habitat preferences: Russian knapweed can commonly be found along roadsides, riverbanks, irrigation ditches, pastures, disturbed areas, clearcuts, and croplands. Russian knapweed does not establish readily in healthy, natural habitats. It typically invades disturbed areas, forming dense single-species stands.

Current Distribution: Light infestations on the Beaverhead, Deerlodge, Bridger-Teton, Gallatin NFs and Yellowstone and Grand Teton NPs.

Interesting facts: Introduced from Eurasia in the late 1800's in contaminated alfalfa and clover seed. The Latin name *repens*, meaning creeping, relates to Russian knapweed's distinct spreading habit. Once established, Russian knapweed forms dense colonies due to the creeping adventitious shoots branching off the black, bark-like roots. Thirty percent of seeds may be viable after eight years of burial.



Spotted knapweed

Centaurea maculosa

Growth habit: Spotted knapweed is an 8- to 48-inch tall perennial with a stout tap root. The plant is hairy and rough with a somewhat woolly appearance.

Leaves: The leaves, which are once or twice divided into lobes on each side of the center vein, are blue-gray in color.

Stems: One or more branching stems, coarse.

Flowers: The pink to purple flowers (rarely white) occur in egg-shaped to oblong heads, which are solitary at the ends of clustered branches.

Other: Stout taproot. Knapweeds release chemical substances that inhibit surrounding vegetation.

Habitat preferences: Best adapted to well-drained, light-textured soils that receive summer rainfall, including habitats dominated by Ponderosa pine and Douglas fir, as well as foothill prairie habitats with bluebunch wheatgrass, needle-and-thread, and Idaho fescue. Adapts well to disturbed sites including gravel pits, animals, power lines, grain elevators, railroad, and equipment yards.

Current distribution: Spotted knapweed is one of the more widespread weeds in the GYA, present on all units. The weed is well established on the Gallatin National Forest.

Interesting facts: Each plant can produce 400 or more seeds per flower stalk. Most seeds fall within a 3 or 4 foot radius of the parent plant. Longer-distance dispersal is by rodents or livestock, in hay or commercial seed, or on vehicles.

Tamarisk

Tamarix ramosissima and T. chinensis

Growth habit: Deciduous or evergreen shrubs or small trees reaching 5 to 20 feet in height.

Leaves: Small leaves on green stems are alternate, overlap each other, and appear scale-like (similar to a cedar tree). Foliage is salty to taste.

Stems: Stems are highly branched with a smooth, dark brown to reddish-brown bark.

Flowers: Flowers, borne in finger-like clusters on terminal and lateral branches, are small, pink to white, and have five petals.

Other: Bark on saplings and stems is reddish brown.

Habitat preferences: Floodplains, riparian areas, wetlands and lake margins.

Current distribution: Watch list. One small infestation in Yellowstone NP. Also in Bridger Teton NF and Grand Teton NP.

Interesting facts: Saltcedar refers to the plants' fine, cedar-like foliage and its ability to grow in saline or alkaline soils. Tamarisk is tolerant of highly saline habitats, and it concentrates salts in its leaves. Over time, as leaf litter accumulates under tamarisk plants, the surface soil can become highly saline, thus impeding future colonization by many native plant species.

Black henbane

Hyoscyamus niger

Growth habit: 1 to 3 feet tall; biennial; coarse, dense leaves.

Leaves: Alternate, sticky leaves are coarsely toothed and covered with hairs.

Stems: Green stems covered with sticky hairs.

Flowers: Funnel-shaped white flowers grow out of the end of the leaves.

Other: Foliage has a foul odor.

Habitat preferences: Roadsides and dry waste areas.

Current distribution: Well established on Bridger-Teton and Caribou-Targhee and present on most units.

Interesting facts: Poisonous plant to humans. Contains alkaloids that occasionally cause livestock poisoning.

Diffuse knapweed

Centaurea diffusa

Growth habit: Stems are upright, 4 to 24 inches tall from deep taproot, highly branched, angled, with short, stiff hairs on the angles.

Leaves: Leaves are pinnately divided into small segments.

Stems: The single, upright stem produces several spreading branches.

Flowers: The white, or occasionally pink, flower head, and the characteristic bracts distinguish diffuse knapweed from other knapweed species. The bracts, located under the flower petals, form stiff, cream to brown-colored spines divided into spreading comb-like teeth.

Other: After the seed matures, the stems become dry and brittle and break off at the ground level, creating a tumbleweed.

Habitat preferences: Diffuse knapweed is found on plains, rangelands, and forested benchlands, particularly on rugged terrain that is not well suited for cultivation. Diffuse knapweed can thrive in semi-arid and arid conditions. The density of a diffuse knapweed stand is often correlated with the level of soil disturbance. Additionally, diffuse knapweed prefers open habitats to shaded areas.

Current distribution: Trace levels detected on Beaverhead Deerlodge, Bridger Teton, Caribou-Targhee, and Gallatin NFs, National Elk Refuge, Grand Teton and Yellowstone NPs.

Interesting facts: The genus name *Centaurea* commemorates the centaur, the mythical creature of Hippocrates, half horse and half man. *Centaurea diffusa* contains the allelopathic chemical cnicin, which can suppress the growth of other species and allow diffuse knapweed to grow in single-species stands.

Oxeye daisy

Chrysanthemum leucanthemum

Growth habit: The mature plant is typically 1 to 2 feet tall with single flower heads on each simple or once-branched stem.

Leaves: Leaves progressively reduce in size upward on stem.

Stems: Stems are smooth to sparsely hairy.

Flowers: Flower heads, 1 to 2 inches in diameter, consist of white ray flowers (long petals) and yellow disk flowers (center of flower head). The flowers have no odor and produce ribbed seeds.

Other: Frequently invades fields and meadows forming dense and expansive populations.

Habitat preferences: Oxeye daisy can survive over a wide range of environmental conditions. It is common in native grasslands, overgrazed pastures, waste areas, meadows, railroad rights-of-way, and roadsides. The plant can grow on a wide range of soils, especially those low in pH and nutrients.

Current distribution: Established on Gallatin, Custer, Bridger Teton and Shoshone NF, and Yellowstone and Grand Teton NP, National Elk Refuge.

Interesting facts: Oxeye daisy is a showy perennial forb which was introduced from Eurasia as an ornamental.

Perennial pepperweed

Lepidium latifolium

Growth habit: Perrenial Pepperweed normally grows 1 to 3 feet tall, but may reach up to 6 feet.

Leaves: The alternative, waxy leaves may have smooth or toothed margins and a prominent, whitish midvein.

Stems: The plant has many stems that emerge from a somewhat woody root crown.

Flowers: Delicate, milky white flowers, which are sometimes collected for dry flower arrangements; grow in dense, rounded clusters at branch tips. Dense infestations appear brilliantly white in mid-summer.

Other: In addition to profuse seed production, perennial pepperweed has an extensive, creeping root system. Dense colonies establish when shoots emerge in late winter and early spring from the branching, underground root system.

Habitat preferences: Perennial pepperweed has the ability to invade and establish in a wide range of habitats. It is most frequently found in riparian areas, marshes, estuaries, irrigation channels, wetlands, and floodplains, but is not exclusive to these areas. If introduced, it can proliferate in roadsides, native hay meadows, alfalfa fields, and rangeland habitats.

Current Distribution: Small infestations on the Bridger-Teton NF, Grand Teton NP, National Elk Refuge and Shoshone NF.

Interesting facts: Perennial pepperweed can act as "salt pumps" which take salt ions from deep in the soil profile, transport them up through their roots and deposit them near the surface. This can favor halophytes and put other species at a disadvantage, thereby shifting plant composition and diversity.

Whitetop/hoary cress

Cardaria draba

Growth habit: Deep rooted perennial up to 2 feet tall.

Leaves: All leaves are covered with soft white hairs, blue-green in color, lance shaped.

Stems: The plants are of near equal height, creating a flat-topped appearance.

Flowers: Dense clusters of small flowers create the white, flat-top appearance from which the common name is derived.

Other: Plants emerge in very early spring.

Habitat preferences: Common on alkaline, disturbed soils.

Current distribution: Established on the Bridger Teton, Caribou Targhee and Shoshone NFs, Grand Teton and Yellowstone NPs, and National Elk Refuge.

Interesting facts: Whitetop/Hoary Cress is a member of the mustard family and therefore has flowers with four petals arranged in a cross.

Orange hawkweed

Hieracium aurantiacum

Growth habit: This perennial weed has a shallow, fibrous root system and a creeping growth form.

Leaves: In the vegetative stage, the basal rosette consists of narrow, spatula-shaped, hairy leaves 4 to 6 inches long and darker green on the upper than the lower surface.

Stems: The largely leafless flowering stems range from 1 to 3 feet in height with occasionally 1 to 3 small leaves present. Bristly hairs are present on the leaves and stems and the entire plant contains a milky juice.

Flowers: Five to 30 flower heads form a compact, umbelliform inflorescence on the terminal stems. Flower heads have red-orange petals with notched tips.

Other: The plant contains a milky juice.

Habitat preferences: Orange hawkweed grows in permanent meadows, grasslands, rangelands, and pastures.

Current distribution: Trace amounts on Beaverhead-Deerlodge, Gallatin and Shoshone NFs, Yellowstone and Grand Teton NPs.

Interesting facts: Grazed by sheep and goats; fair forage for cattle, horses, and big game animals.

Distribution of Key Noxious Weeds on Federal land in the Greater Yellowstone Area

Based on available data from FY 2000

The current distribution of the featured noxious weeds is summarized below:	Beaverhead-Deerlodge Madison RD	Bridger-Teton	Custer-Beartooth	Caribou-Targhee	Gallatin	Grand Teton	National Elk Refuge	Red Rock Lake	Shoshone	Yellowstone
Black Henbane *Hyoscyamus niger*	○	●	○	●	○	○	○	○	●	○
Common Tansy *Tanacetum vulgare*	●	●	○	●	●	●	○	●	○	○
Canada thistle *Cirsium arvense*	●	●	○	●	●	●	●	●	●	●
Dalmatian toadflax *Linaria dalmatica*	○	●	●	●	●	●	○	○	●	●
Diffuse knapweed *Centaurea diffusa*	○	○	○	○	○	○	○	○	○	○
Dyer's woad *Isatis tinctoria*	○	●	○	●	○	○	○	○	○	○
Houndstongue *Cynoglossum officinale*	●	●	●	●	●	●	○	○	●	●
Leafy spurge *Euphorbia esula*	○	●	●	●	●	○	○	○	●	○
Marsh sowthistle *Sonchus arvensis*	○	●	○	○	○	○	○	○	○	○
Musk thistle *Carduus nutans*	●	●	○	●	●	●	●	○	●	●
Orange hawkweed *Hieracium aurantiacum*	○	○	○	○	○	○	○	○	○	○
Oxeye daisy *Chrysanthemum leucanthemum*	○	●	●	○	●	●	●	○	●	●

○ No evidence on unit to date, or eradicated from unit

○ Trace, less than 5 acres

● Established, with 5-100 acres infested

Distribution of Key Noxious Weeds on Federal land in the Greater Yellowstone Area

Based on available data from FY 2000

	Beaverhead-Deerlodge Madison RD	Bridger-Teton	Custer-Beartooth	Caribou-Targhee	Gallatin	Grand Teton	National Elk Refuge	Red Rock Lake	Shoshone	Yellowstone
The current distribution of the featured noxious weeds is summarized below:										
Perrenial pepperweed *Lepidium latifolium*	○	◉	○	○	○	◉	◉	○	◉	○
Purple loosestrife *Lythrum salicaria*	○	○	○	○	○	○	○	○	○	○
Rush skeletonweed *Chondrilla juncea*	○	○	○	○	○	○	○	○	○	○
Russian knapweed *Acroptilon repens*	◉	◉	○	○	◉	◉	◉	○	○	◉
St. Johnswort *Hypericum perforatum*	◉	◉	◉	●	◉	◉	●	◉	○	◉
Spotted knapweed *Centaurea maculosa*	●	●	●	●	●	●	◉	◉	◉	●
Sulfer cinquefoil *Potentilla recta*	○	◉	◉	◉	◉	◉	○	○	◉	◉
Tall buttercup *Ranunculus acris*	○	○	○	○	○	○	○	○	○	◉
Tamarisk *Tamarix ramosissima*	○	○	○	○	○	○	○	○	○	○
Whitetop *Cardaria draba*	◉	●	○	◉	◉	◉	◉	○	●	◉
Yellow hawkweed *Hieracium pratenses*	○	○	○	○	○	◉	○	○	○	◉
Yellow starthistle *Centaurea solstitialis*	○	○	○	○	○	○	○	○	○	○
Yellow toadflax *Linaria vulgaris*	◉	◉	◉	●	●	◉	◉	○	◉	◉

◉ Well established, with 100-1,000 acres infested

● Widely established, with over 1,000 acres infested

Key Contacts

If you discover weed infestations on your unit or on an adjacent unit, contact the weed coordinator for that unit. Information on the species, size of the infestation, and exact location of the infestation is helpful. If you are unsure of the species, collect a sample and bring it to your local coordinator.

Idaho:

Caribou-Targhee National Forest — (208) 557-5791
Bureau of Land Management, Idaho Falls — (208) 524-7500
Idaho Department of Fish & Game — (208) 624-7065
Sand Creek Wildlife Management Area
Fremont County Weed Control — (208) 624-3102
Harriman State Park — (208) 558-7368
Henry's Lake State Park — (208) 558-7532
Teton County Weed Control — (208) 354-2961

Montana:

Beaverhead-Deerlodge National Forest — (406) 682-4253
Custer National Forest — (406) 446-2103
Gallatin National Forest — (406) 587-6702
Bureau of Land Management, Dillon FO — (406) 682-2337
Red Rock Lake Refuge — (406) 276-3536
Carbon County Weed District — (406) 962-3967
Gallatin County Weed District — (406) 582-3265
Madison County Weed District — (406) 843-5594
Park County Weed District — (406) 222-4156
Stillwater County Weed District — (406) 328-4165

Wyoming:

Bridger-Teton National Forest — (307) 739-5500
Shoshone National Forest — (307) 527-6241
Bureau of Land Management, Cody FO — (307) 579-5900
Bureau of Land Management Lander FO — (307) 332-8400
National Elk Refuge — (307) 733-9212
Grand Teton National Park — (307) 739-3678
Yellowstone National Park — (307) 344-2003
Fremont County Weed & Pest Control District — (307) 332-1052
Hot Springs County Weed & Pest Control District — (307) 864-2278
Park County Weed & Pest Control District — (307) 527-8884
Sublette County Weed & Pest Control District— (307) 367-4728
Teton County Weed & Pest Control District — (307) 733-8419

The following partners contributed
to the Greater Yellowstone
Coordinating Committee
Weed Pocket Guide:

USDA Forest Service
USDI National Park Service
USDI Fish and Wildlife Service
Center for Invasive Plant Management
Bureau of Land Management

CENTER FOR INVASIVE PLANT MANAGEMENT

U.S. DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT