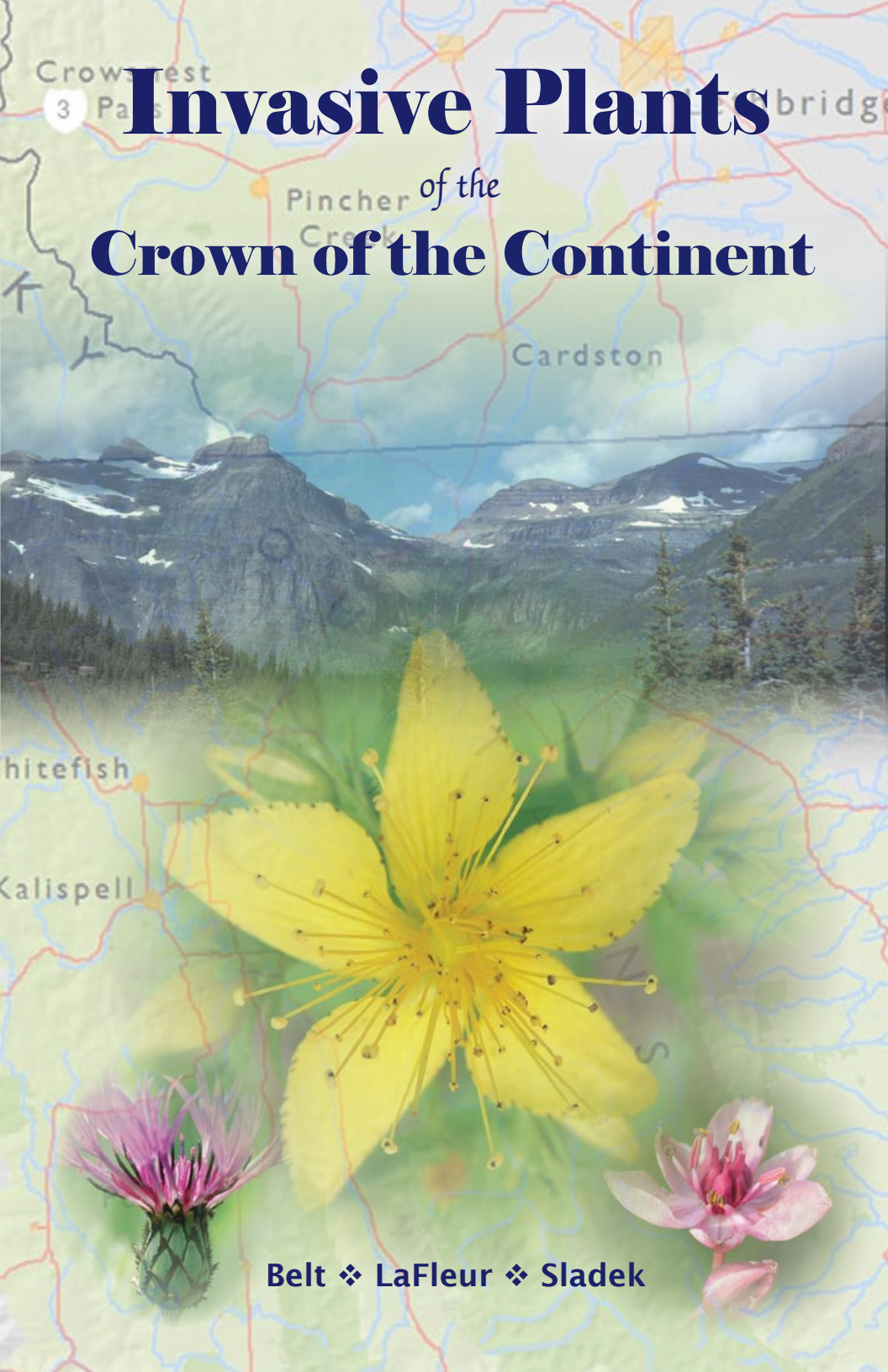
Invasive Plants *of the* Crown of the Continent



Belt ❖ LaFleur ❖ Sladek

Invasive Plants

of the

Crown of the Continent

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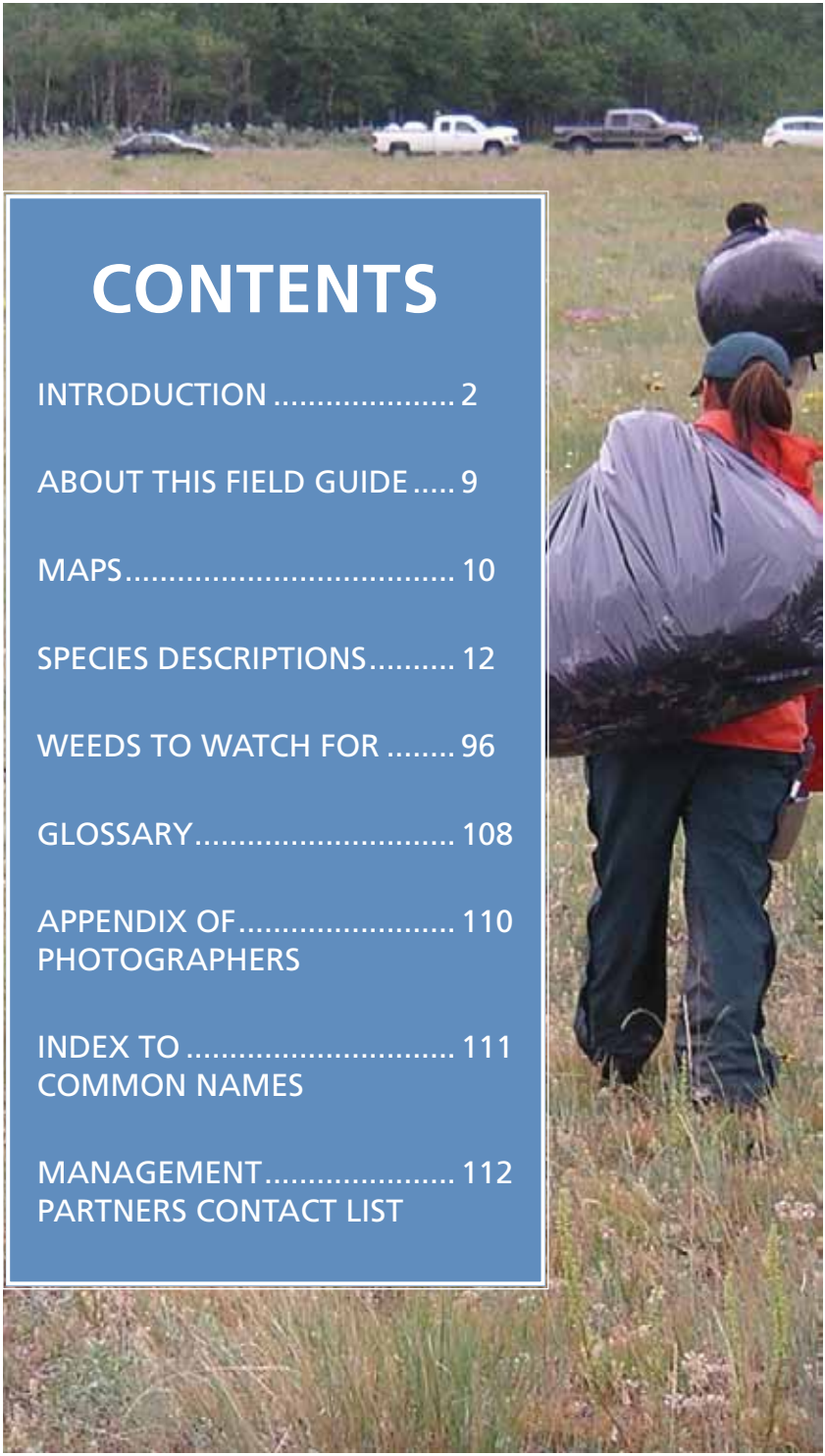

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Introduction

The Crown of the Continent Ecosystem encompasses 16,000 square miles (44,000 square kilometers) of the Rocky Mountains. Stretching between British Columbia, Alberta, and Montana, it is one of the world's premier mountain eco-regions. Glaciers cling to the mountain peaks and waterfalls pour into turquoise rivers that flow through U-shaped valleys. In the lowlands are deep blue lakes and prairie grasses. It is an international destination. People come for an opportunity to see grizzly bears digging up camas bulbs, or mountain goats munching glacier lilies in their natural habitat. It is a beautiful landscape, but its value is greater than aesthetics. The Crown of the Continent is the most biologically intact ecosystem in North America.

From lush alpine meadows to the windswept prairie, there is a wide diversity of habitat. The Continental Divide splits the Crown north to south, creating distinct eastern and western biomes characterized by their difference in climate. Within those two biomes are five eco-

regions that support over 70 species of mammals, 260 species of birds, and over 1,000 native plant species. These native plant communities are the foundation of the Crown of the Continent Ecosystem. They stabilize the soil and provide nutrients and habitat to other plants, animals, and insects.

These eco-regions are also among the most protected landscapes in North America. The Crown of the Continent contains such protected wildlands as Glacier National Park, the Bob Marshall Wilderness Complex, and Waterton Lakes National Park in Canada. In fact, sixty percent of the Crown of the Continent is managed as public lands. The relative scarcity of human population and the lack of private land make this one of the most intact ecosystems in the lower 48, allowing visitors and residents alike to experience the beauty, splendor, and freedom of a truly wild place.

Even with these large tracts of public land and increasing conservation efforts on private lands, the native plant communities in the Crown of the Continent are at serious risk. The single greatest threat facing land managers in the Crown today is the invasion of non-native invasive plants.

In Glacier National Park alone, 126 non-native species are competing with the park's native plants. These invaders are not restricted to Glacier; they endanger the entire Crown of the Continent ecosystem. By outcompeting and thus eliminating the existing native plants, invasive species reduce the biodiversity of the area. And many of these invasive species are harmful or deadly to wildlife and livestock. Even large tracts of remote wilderness, such as the Bob Marshall Wilderness Complex, are not impervious to these threats. Invasive seeds travel by wind, water, animals, and human activity, allowing them to reach all corners of the Crown.

Today, roughly ten percent of the plants in the Crown of the Continent are non-native. The rapidly increasing number of noxious weeds, or non-native plants especially destructive to the environment, pose a serious threat to the area's internationally recognized biodiversity.

This Invasive Plant Field Guide for the Crown of the Continent Ecosystem will provide you with a necessary tool to help stop the spread of invasive species…in your yard, while on hikes, or as a member of a management crew. The most effective management begins with prevention, early detection, and rapid response.
Use this guide to help you identify invasive plants, discern them from native plant look-alikes, learn about their reproduction and dispersal strategies, and prevent them from overtaking native plant communities. The true value of the Crown of the Continent resides in the health of its biotic communities. Please do your part to protect the Crown of the Continent Ecosystem.

Invasive Plants...What's the Problem?

The term "weed" can be ambiguous. Basically, a weed is a plant out of place. It is any plant not native to the area it inhabits. Some weeds are non-native plants used as ornamentals in garden settings and are relatively harmless. Others, called invasive plants, invade disturbed as well as undisturbed areas and can be very harmful to the native flora and fauna. Certain invasive plants are particularly destructive to the native environment – these are noxious weeds. Everyone has a legal responsibility to help control them.

Some invasive plants, such as Common tansy and Baby's breath, were deliberately cultivated by people but escaped to invade other areas. Many species were never intentionally brought into the region, but have spread from other areas, sometimes hundreds of miles away. Invasives are carried into new places by people, animals, machinery, and wind.

Invasive plants have been present in the Crown of the Continent Ecosystem for many years. These invasive plants come from different ecosystems in other parts of the world. They arrived in North America without the natural controls of insects, plant diseases, and competing plants that kept their populations in check in their native countries. Once established, invasive plants are tough to get rid of because they produce hundreds (if not thousands) of seeds and/or they have extensive root systems. The most aggressive invasives spread into grasslands and forests, reducing wildlife habitat, increasing soil erosion, and diminishing the diversity of flora.

Invasive plants are able to spread rapidly because they are so resilient. Forced to compete outside their natural environment, invasive plants often adapt into hardier strains and develop new reproduction strategies in order to cope with the stresses of their new environment. For example, Spotted knapweed secretes a chemical into the ground, which prevents seed germination of other plant species that try to

Michael Rasy, University of Alaska, Bugwood.org

SPOTTED KNAPWEED

grow nearby.

Areas of recent and/or constant disturbance, such as roadsides, are the most susceptible to weed invasion. While some disturbance mechanisms are natural, such as flooding and wildfire, human activities along roadsides and construction sites are primary vectors for weed infestations. Invasives out-compete native plants for water, soil nutrients, sunlight and space to grow. Once invasive plants become established, there are far-reaching consequences throughout the ecosystem for the native plant and wildlife communities.

In a healthy plant community, various native plants fill every ecological niche in the system. Especially important are the variety of root systems from different species of plants that work together to hold the soil in place. When an invasive plant species takes over an area, one type of root system dominates, and often soil erosion can occur. This can put local water resources at risk due to increased run off. Such damage cannot be easily fixed, even if the invasives are removed from the environment.

Invasive plants also decrease suitable wildlife habitat. The native fauna are adapted to depend on native plant species for food sources. When invasive plants become prevalent in an area, they severely reduce the number of native species. This causes wildlife to seek out new areas to forage, and in turn can change the movement patterns of not only herbivores and ungulates, but also the predators that depend on them.

Invasive plants reduce economic productivity as well as the ecological integrity of the Crown of the Continent's lands and waters. The rate of introduction and spread of invasive weeds has increased dramatically over the past 150 years with increases in human activities, trade, and commerce. Disturbingly, the numbers of invasive plant species listed in Canada and the United States are increasing in quantity, area, and density. Managers in the Crown are concerned that invasive plants will spread even more rapidly in the near future due to predicted climate change impacts, including increasing frequency and severity of wildfires, and ecosystem-scale changes in the growing conditions for native and non-native invasive plants.

The spread of invasive plants represents a profound threat to global biodiversity and threatens the values of wildland ecosystems. As the amount of land covered by invasive plant species continues to increase, the severity of the threat grows exponentially day by day. Especially in pristine areas of the Crown of the Continent Ecosystem, the invasion, establishment, and spread of invasive, non-native plants is perhaps the single greatest threat facing managers today.

Managing Invasive Plants

Due to the insidious nature of this threat, many strategies for limiting the spread of invasive plants have been researched and developed. Most managers choose to use Integrated Weed Management (IWM), a multidisciplinary approach using a combination of methods and treatments that are best suited for specific species and locations. The treatment methods used can be manual, mechanical, cultural, biological, and/or chemical, dependent on the situation.

A critical part of IWM is prevention. Prevention is considered the most important and effective method of stopping the spread of invasive plants. The most efficient and easiest way to control an invasive plant problem is to avoid having one to begin with. By attempting to prevent seeds from being introduced into new areas and quickly managing any infestations that do arise, the much greater difficulty of trying to remove immense populations of invasive plants is avoided. By taking extra care to watch for weed seeds on clothing, shoes, boots, animals, and vehicles, anyone and everyone can help prevent the spread of invasive weeds in a park, at home, or in their community.

A key component of prevention is education. The more we educate each other about invasive plants the better we will all become at identifying and controlling invasives before they become well established. Early detection and rapid response are essential strategies for prevention. The earlier we find an invasive weed, the more successful we will be at controlling it. Due to the myriad of consequences an infestation can have, and the ability of one plant to reproduce and replicate itself many times, every single weed is a threat. Crown of the Continent Ecosystem (CCE) managers are committed to preventing the spread of invasive weeds. With the cooperation of staff and visitors, the CCE can avoid being overrun by more invasive plants.

In those areas where an invasive plant problem already exists, careful management is exercised to control invasive populations and keep them from spreading.

<u>Control Methods Used:</u>

- **Manual**: Hand-pulling, hand cutting and digging of weeds.
- **Mechanical**: Machine cutting and mowing of weeds.
- **Cultural**: Competition for invasive weeds by planting native plant species and/or the use of fire as a management tool.
- **Biological**: Introductions of insects and fungi that stress weed

populations.

- **Chemical:** Application of herbicides to control invasive weeds.

IWM provides the best control by making use of all tools available rather than relying on any single treatment method. IWM methods are chosen to minimize harm to native plant, animal, and aquatic communities. Control measures are undertaken cautiously to minimize interference with the ecosystem. Actions are based on research and consultation with field experts.

Preserving the ecological integrity of the Crown of the Continent Ecosystem is essential to maintaining the biodiversity found here. The threat of invasive plants must be controlled but without further detriment to the ecosystem. After invasive plant management efforts, it is essential to monitor for effectiveness. In some cases, revegetation with desirable species may be necessary in order to restore the desired condition.

VOLUNTEERS PULLING NOXIOUS WEEDS

In this field guide there are recommendations for manual treatments for specific species. We do not, however, discuss all of the control methods. There are simply too many to address and new innovations are always being introduced. The following organizations represent a few of the many resources that offer guidance about more comprehensive treatment methods:

* The Nature Conservancy Global Invasive Species Team
* USDA National Invasive Species Information Center
* Alberta Invasive Plants Council Invasive Plant Fact Sheets
* Invasive Plant Council of British Columbia Targeted Invasive Plant Solutions (T.I.P.S.)
* Montana Weed Control Association

The Crown Invasive Plant Network

Managing an ecosystem is tough. Managing an ecosystem divided by political and national borders can be even more of a challenge. Recognizing these challenges, a group of resource managers created the Crown of the Continent Ecosystem Managers Partnership in 2001. This partnership includes representatives from more than twenty local, state, provincial, tribal, and federal government agencies.

Each year the Crown Managers Partnership (CMP) holds a forum that highlights a common theme of interest or concern to the region. In 2005, the theme was invasive plant management. Presentations were given on invasive plant management programs and strategies from both the Canadian and American perspectives. During facilitated sessions, group participants identified priority invasive plant management action items that could be supported through the CMP. The primary action item identified was the creation of a Crown Invasive Plant Network (CIPN), which incorporated representatives from agencies throughout the Crown of the Continent Ecosystem who wanted to continue communication on invasive plant issues.

Goals identified for the CIPN were to:

* Facilitate application of a risk assessment approach to jurisdictions in Canada.
* Support the design and production of education and outreach products across the Crown of the Continent ecosystem.
* Establish best management practices for a range of activities that may encourage spread and establishment of invasive plants.
* Provide web-based information for invasive plant managers in the Crown of the Continent Ecosystem (CCE).

The CIPN partnership provides an essential opportunity for managers to communicate about invasive plants. CIPN members share knowledge of management practices, monitoring techniques, education tools, and coordinating projects. This continued cooperation across boundaries encourages prevention, control of invasive plant species, and subsequent restoration with native plants.

CIPN members identified as their first priority the creation of a field guide for existing and potential plant invaders in the CCE. Initial funding was secured through a grant from the National Park Service's Intermountain Region International Conservation Programs Office (IMRICO). Additional funding was contributed by the various organizations involved with this project, which are listed on pages 112–116.

About This Field Guide

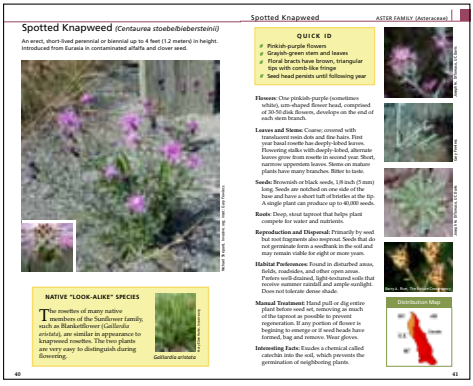
Included Species

Crown Invasive Plant Network members had many discussions regarding which species to select for this field guide. It was not an easy decision. We decided to emphasize invasive plants that threaten protected areas and parks. We first selected all species that are currently listed as noxious, restricted, nuisance, or invasive agronomic on state, provincal, and/or regional weed lists in Montana, Alberta, and British Columbia. We then encouraged managers to nominate additional invasive plant species that are a priority in their area, as well as species with the potential to emerge as new invaders in the CCE. All participants of CIPN then voted by consensus on 42 species that they felt currently posed the greatest threats.

Comprehensive information about those species is provided in this guide. CIPN members also decided that 21 additional invasive plants warranted enough concern for brief descriptions.

Using the Field Guide

Invasive plants in this guide are organized taxonomically according to the family in which they belong. The plants within each family are organized alphabetically by their common name. Color tabs represent separate family groups. Each of the comprehensive species is presented on two pages with photos and short descriptions of identifying characteristics, native look-alike species, habitat, and manual treatment recommendations. A distribution map within the Crown of the Continent Ecosystem is also included for each species (see "Understanding the Distribution Maps" on page 10). Following the comprehensive species are brief descriptions of 21 invasive plants to watch for. These selected invasive plants are labeled "Weeds to Watch For" and include fewer photos and text identifying pertinent characteristics and habitat.


Spotted Knapweed (*Centaurea stoebe/biebersteinii*)

An erect, short-lived perennial or biennial up to 4 feet (1.2 meters) in height. Introduced from Eurasia in contaminated alfalfa and clover seed.

Spotted Knapweed — ASTER FAMILY (*Asteraceae*)

QUICK ID
- Pinkish-purple flowers
- Grayish-green stem and leaves
- Floral bracts have brown, triangular tips with comb-like fringe
- Seed head persists until following year

Flowers: One pinkish-purple (sometimes white), urn-shaped flower head, comprised of 30-50 disk flowers, develops on the end of each stem branch.

Leaves and Stems: Coarse; covered with translucent resin dots and fine hairs. First year basal rosette has deeply-lobed leaves. Flowering stalks with deeply-lobed, alternate leaves grow from rosette in second year. Short, narrow oppositate leaves. Stems on mature plants have many branches. Bitter to taste.

Seeds: Brownish or black seeds, 1/8 inch (3 mm) long. Seeds are notched on one side of the base and have a short tuft of bristles at the tip. A single plant can produce up to 40,000 seeds.

Roots: Deep, stout taproot that helps plant compete for water and nutrients.

Reproduction and Dispersal: Primarily by seed but root fragments also resprout. Seeds that do not germinate form a seedbank in the soil and may remain viable for eight or more years.

Habitat Preferences: Found in disturbed areas, fields, roadsides, and other open areas. Prefers well-drained, light-textured soils that receive summer rainfall and ample sunlight. Does not tolerate dense shade.

Manual Treatment: Hand pull or dig entire plant before seed set, removing as much of the taproot as possible to prevent regeneration. If any portion of flower is beginning to emerge or if seed heads have formed, bag and remove. Wear gloves.

Interesting Facts: Exudes a chemical called catechin into the soil, which prevents the germination of neighboring plants.

NATIVE "LOOK-ALIKE" SPECIES

The rosettes of many native members of the Sunflower family, such as Blanketflower (*Gaillardia aristata*), are similar in appearance to knapweed rosettes. The two plants are very easy to distinguish during flowering.

Gaillardia aristata

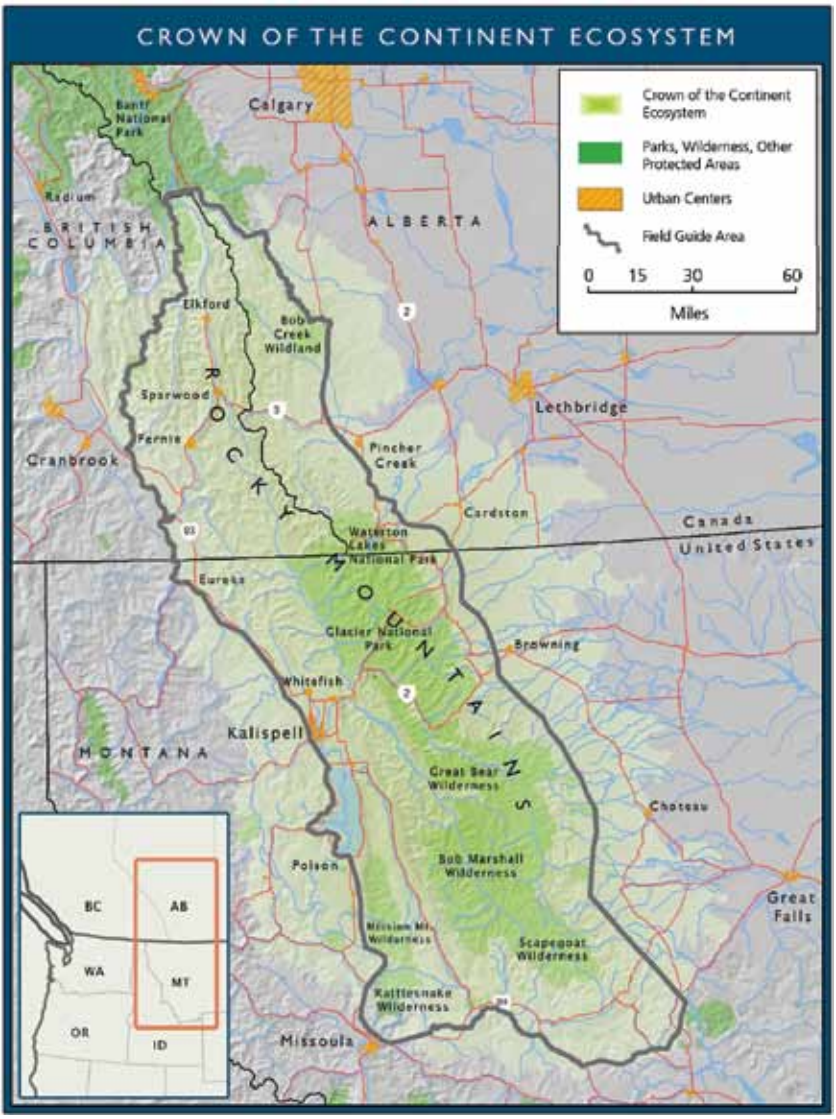
Distribution Map

40 41

Any sightings of invasive plant populations, especially those not abundant in the CCE, should be reported to the appropriate resource manager for the area (see Management Partners Contact List on pages 112–116).

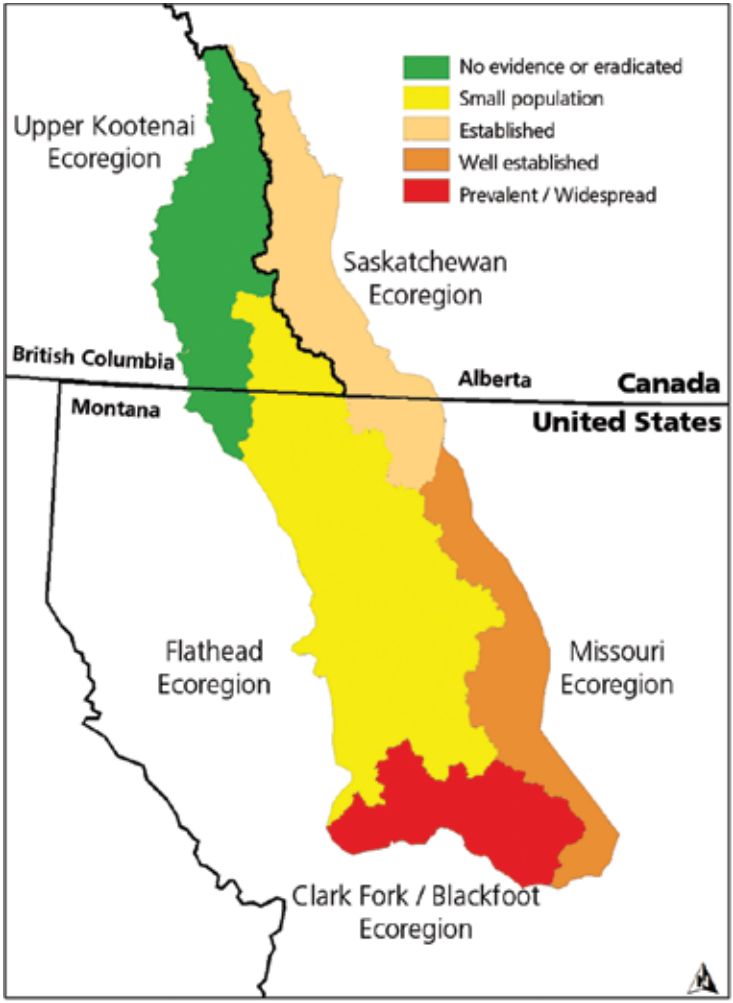
INVASIVE PLANTS IN THE CROWN

Understanding the Distribution Maps



The Crown of the Continent Ecosystem (CCE) is a dynamic concept, causing the boundaries to fluctuate. For updated information regarding the CCE, please refer to the Crown Managers Partnership website at www.rockies.ca/cmp/. This field guide uses the defined boundary of the CCE as of 2008, which is delinated by the gray outline on the above map.

DISTRIBUTION MAP

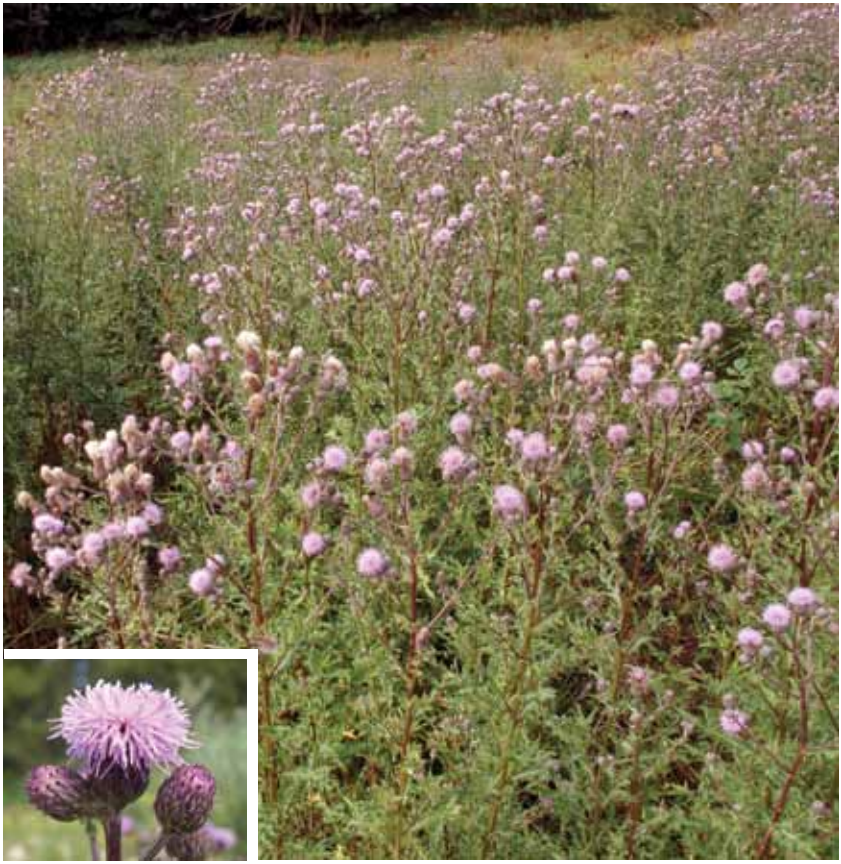


Watershed Ecoregion Descriptions:
Upper Kootenai = Fisher, Elk and St. Mary river basins of the Columbia River watershed
Saskatchewan = Highwood, Upper and Middle Oldman, Belly, Waterton and St. Mary river basins
Flathead = Flathead Lake, Lower, North, South and Middle Fork Flathead, Stillwater and Swan river basins of the Columbia River watershed
Missouri = Milk, Cut Bank, Two Medicine, Teton, Sun, Upper Missouri, and Upper Dearborn river basins
Clark Fork/Blackfoot = Blackfoot, Middle and Upper Clark Fork river basins

The Invasive Weed Distribution Maps capture a moment in time. Based on current findings, these maps show the present distribution of invasive plants. The map above demonstrates the different regions of the Crown of the Continent Ecosystem. The colors on the map correspond with the key to indicate the status of each species' distribution. If you see invasive plant populations, especially those in a green or yellow region (indicating little to no existence) please record the location and contact the appropriate manager (see pages 112–116).

Canada Thistle *(Cirsium arvense)*

A perennial, up to 1.2 meters (4 feet) tall, that often forms colonies from deep, spreading roots. Produces a non-flowering rosette its first year. Introduced from southeastern Eurasia to Canada in contaminated crop seed.



Dr. Amadej Trnkoczy, Inset: The Nature Conservancy

NATIVE "LOOK-ALIKE" SPECIES

Hooker's thistle, *Cirsium hookerianum*, tends to grow individually rather than in dense colonies. It typically has white to pink flowers and has a taproot rather than rhizomes. This species also referred to as Elk thistle.

Ben Legler

Cirsium hookerianum

QUICK ID

- Prickly stems and stalkless leaves
- Extensive creeping rhizomes
- Purplish-pink flowers less than 2.5 cm across
- Floral bracts generally lack sharp spines

Steve Dewey, Invasive.org

Flowers: Clusters of pinkish-purple (occasionally white) flowers attach to top of branches or emerge from the joint where leaves attach to stem. Directly below the flower petals are several rows of overlapping floral bracts, which generally lack sharp spines.

Louis-M. Landry

Leaves and Stems: Stalkless, alternate leaves 5 to 15 cm long. Leaves are prickly and spine-tipped with a wavy surface, toothed margins, and irregularly shaped lobes. Soft wooly hairs often cover underside of leaf. Hollow, leafy stems lack wings, branch near the top, and become hairy with age.

Seeds: Light brown seeds, 3 to 4 mm long, with feathery white plume attached. Each plant may produce over 40,000 seeds that remain viable for up to 21 years.

Roots: Deep creeping roots, or rhizomes, allow plant to survive below the cultivation zone.

Dr. Shawn Askew, Virginia Tech

Reproduction and Dispersal: Although seeds can be dispersed by wind, reproduction is primarily from creeping underground rhizomes, or roots with buds.

Habitat Preferences: Roadsides, pastures, fields, forest openings, stream banks, and disturbed sites. Prefers moist soil. Typically does not tolerate heavy shade.

Manual Treatment: Occasional hand-pulling and cultivation may increase infestations by dispersing root fragments. However, repeated cultivation, mowing, or hand-cutting reduces and can eventually eliminate infestations.

Interesting Facts: Each plant has both male and female flowers; female flowers have a

Distribution Map

Common Crupina *(Crupina vulgaris)*

Slender, erect, short-lived annual, up to 1 meter (3 feet) tall. Begins as a fleshy oval seedling then develops into a basal rosette. Originally from Mediterranean region.

UT State University, Invasive.org. Inset: Joseph M. DiTomaso, UC Davis

"LOOK-ALIKE" SPECIES

Several **non-native** knapweed species, such as this Russian knapweed, appear similar to Common crupina in overall appearance, but lack bristly, barb-tipped hairs on the leaf margins.

Steve Dewey, Invasive.org

Acroptilon repens

QUICK ID

- Long, narrow, rose-purple flowers
- Short, stiff, barb-tipped hairs on leaf margins
- Fleshy, oval-shaped rosette leaves with distinct purple midribs
- Seeds with a ring of dark, stiff bristles

UT State University, invasive.org

Steve Dewey, Invasive.org

UT State University, Invasive.org

Joseph M. DiTomaso, UC Davis

Flowers: Narrow, 1.3 cm-long flower heads composed of 3 to 6 rose-purple disk flowers. One to five flowerheads occur at branch tips or in upper leaf axils (where leaves are attached to stems).

Leaves and Stems: One stiff, branched flower stem develops during its second year; rosette leaves wither. Stem leaves are alternate, stalkless, and smaller toward the top. Rosette and stem leaves are deeply lobed with short, stiff, barb-tipped hairs on the leaf margins, making the plant prickly feeling.

Seeds: Iridescent, black-brown, oblong seeds with a ring of dark, stiff bristles encircling the end.

Roots: Short, dense, fibrous taproot.

Reproduction and Dispersal: By seed only. Seeds typically fall near the parent plant but seeds and whole flower heads can be dispersed further by soil movement, water, animals, and human activity.

Habitat Preferences: Prefers dry, south-facing slopes. Disturbed areas, grasslands, open forests, canyons, riparian areas, croplands, pastures, and roadsides.

Manual Treatment: Eradication can be effective if this weed is caught early and seed production is prevented. Hand pulling before flowering is generally effective for controlling small infestations. Mowing after flowering is not recommended due to the likelihood of increased dissemination. **Report all sightings.**

Interesting Facts: Unpalatable forage for grazing animals. Currently most prolific in Idaho.

Distribution Map

Common Tansy *(Tanacetum vulgare)*

Erect, bushy perennial 30 cm to 1.8 meters (1 - 6 feet) tall. Forms dense patches. Introduced from Europe in the 1600s for its medicinal qualities.

MT SNWAEC. Inset: Anne Elliott

NATIVE "LOOK-ALIKE" SPECIES

Bracted lousewort, *Pedicularis bracteosa*, has similar fern-like leaves but can be easily distinguished during flowering when its spike of pale yellow to purplish flowers, composed of a short lower lip and a longer, hooded upper lip, emerge.

Ben Legler

Pedicularis bracteosa

QUICK ID

- Dark green fern-like leaves
- Stems often purplish-red
- Yellow, button-like flowers in a dense, flat-topped cluster
- Leaves and flowers aromatic when crushed

Ben Legler

Louis-M. Landry

Joseph M. DiTomaso, UC Davis

Flowers: Dense, flat-topped clusters of 20 to 200 yellow-orange, button-like flowers at tops of stems. Flower heads consist of disk flowers surrounded by a ring of ray flowers that lack petals. Greenish-brown bracts below the flower heads overlap in 2 to 3 rows and have papery tips.

Leaves and Stems: Dark green, fern-like leaves are deeply divided into leaflets with toothed margins and are dotted with small pitted glands. Stems are green or purplish-red, dotted with glands and somewhat woody near the base. Several branched stems per plant. Stem leaves are alternate.

Seeds: Oblong, tan to gray, five-angled seeds, 1.5 mm long. Can produce over 50,000 seeds.

Roots: Extensive, short, thick creeping roots, or rhizomes, with numerous lateral roots.

Reproduction and Dispersal: By seeds, creeping roots, and root fragments.

Habitat Preferences: Disturbed areas, streambanks, riverbanks, waterways, roadsides and fields. Prefers full sun and well-drained soil.

Manual Treatment: Repeated pulling, hand cutting or mowing before flowering limits seed production and may deplete energy reserves stored in roots.

Interesting Facts: Has been used medicinally to expel intestinal worms, to repel insects, and to stimulate menstrual bleeding. Toxic if ingested in large quantities, but can be grazed safely by sheep and goats.

Distribution Map

Diffuse Knapweed *(Centaurea diffusa)*

Erect, short-lived perennial, biennial, or annual up to 0.6 meters (2 feet) in height. Introduced from Eurasia in contaminated alfalfa and clover seed.

Clayton J. Antieau. Inset: Richard Old, www.xidservices.com

NATIVE "LOOK-ALIKE" SPECIES

Many native species of Purple aster appear similar at first glance, but can be distinguished by the presence of white or purplish petal-like ray flowers, a center of yellow disk flowers, and bracts below the flowerheads in series of unequal length.

Mary Ellen Harte, Invasive.org

Symphyotrichum laeve

QUICK ID

- White (or pinkish-purple) flowers
- Deeply lobed basal & lower stem leaves
- Triangular floral bracts tipped with slightly recurved spines
- Stems break off at ground level after seed matures, creating a tumbleweed

Steve Dewey, Invasive.org

Flowers: One white (or pinkish-purple), urn-shaped flower head, composed of 12 to 13 disk flowers, develops on the end of each stem branch. The triangular floral bracts are tipped with a short, cream to brown-colored spine that is slightly recurved. Margins of bracts have slender, comb-like teeth.

Ben Legler

Leaves and Stems: Coarse; covered with fine hairs that give them a grayish-green appearance. First year basal rosette has leaves up to 15.24 cm long with deeply-lobed segments. Flowering stalks with alternate leaves grow from the rosette during the second year. Single main stem divides into numerous spreading branches on mature plant, giving it a bushy appearance.

Seeds: Oblong, 3 mm long, dark brown or gray.

Roots: Deep, elongated taproot.

Ben Legler

Reproduction and Dispersal: Primarily by seed but root and crown fragments also resprout. Wind-blown "tumbleweeds" help to disperse seeds greater distances.

Habitat Preferences: Found in fields, roadsides and other open areas. Can spread rapidly in disturbed sites. Prefers well-drained, light textured soils that receive ample sunlight. Prefers a drier site than Spotted knapweed.

Manual Treatment: Hand pull or dig entire plant before seed set, removing as much of the taproot as possible to prevent regeneration. If any portion of the flower is beginning to emerge or if seed heads have formed, bag and remove. Wear gloves.

Interesting Facts: A fertile hybrid between Diffuse & Spotted knapweed has been identified.

Distribution Map

Meadow Hawkweed Complex

(Hieracium pratense/caespitosum/floribundum)

Perennial with a creeping growth form ranging from 30 cm to 1 meter (1 - 3 feet) tall. Species are difficult to distinguish from one another because they interbreed. Introduced from Europe as garden ornamentals and medicinal herbs.

Richard Old, www.xidservices.com. Inset: Louis-M. Landry

NATIVE "LOOK-ALIKE" SPECIES

There are many native hawkweeds in this ecosystem with yellow or white flowers, but native hawkweeds lack above-ground runners, usually have leafy branched stems, and have flowers arising from stalks that are attached to the stem at the same point.

Dr. Amadej Trnkoczy

Hieracium umbellatum

QUICK ID

- Clusters of yellow flowers at top of stem
- Exudes a milky latex juice when broken
- Short, stiff hairs on stem; hairy leaves only at base
- Above-ground runners

Louis-M. Landry

Flowers: Crowded terminal clusters (5 to 30 flower heads) of dandelion-like, yellow flowers. Petals have notched tips.

Leaves and Stems: Entire, hairy leaves in a rosette at the base of the plant. Leaves are narrow and club-shaped; darker green on topside of leaf and lighter green underneath. Stems leafless (or with 1 to 3 small clasping leaves below midpoint of stem) with short, stiff hairs. One rosette can produce 10 to 25 flowering stems.

Richard Old, www.xidservices.com

Seeds: Tiny black seeds with tawny-white plumes attached on the flattened end. Microscopic barbs easily attach to passersby. Seeds are viable up to seven years.

Roots: Shallow fibrous roots with a woody stem base.

Richard Old, www.xidservices.com

Reproduction and Dispersal: By seed, roots, and rapidly spreading stolons (or above-ground runners). Each plant can produce 4 to 12 leafy stolons, which also create a dense mat that impedes other vegetation.

Habitat Preferences: Low to mid-elevations in disturbed areas, pastures, meadows, wetlands, roadsides, grasslands, forest clearings or openings and lawns. Will not tolerate heavy shade.

Manual Treatment: In small infestations, hand pull entire plant (including stolons), cut below ground, or cut flower seed head. Mowing prevents seed production but encourages spread by stolons.

Interesting Facts: Similar to Orange hawkweed but have yellow instead of orange flowers. Grazed by sheep and goats.

Distribution Map

Meadow Knapweed *(Centaurea pratensis)*

Erect, short-lived perennial or biennial up to 1.2 meters (4 feet) in height. Meadow knapweed is a fully fertile hybrid between Black knapweed and Brown knapweed. Because it is a hybrid, its traits can vary. Introduced from Eurasia.

Don Knoke. Inset: Cindy Roche, Invasive.org

NATIVE "LOOK-ALIKE" SPECIES

Dotted blazing star, *Liatris punctata*, a native perennial found in dry grasslands and hillsides appears similar, but can be distinguished by its dense spikes of tube-shaped flowers with 5 florets.

http://montana.plant-life.org

Liatris punctata

QUICK ID

- Pinkish-purple flowers
- Leaves have entire margins or shallow lobes
- Floral bracts are papery with a brownish fringe
- Seed head from previous year persists

Mandy Tu, The Nature Conservancy

Flowers: One pinkish-purple (or occasionally white), globe-shaped flowerhead develops on the end of each stem branch. The papery bracts below the flowerhead have a tan to dark-brown, bushy fringe. During flowering the bracts reflect a metallic, golden sheen.

Leaves and Stems: Coarse; covered with fine hairs that give it a grayish-green appearance. Entire, undivided leaves with margins that may be wavy or toothed distinguish it from other knapweeds. Basal rosette leaves are up to 15.24 cm long, taper at both ends, and may be shallowly lobed. Middle and upper leaves are smaller, nearly stalkless, and are not lobed.

King County Noxious Weed Control

Seeds: Ivory white to light-brown seeds.

Roots: Deep, stout taproot. Mature plants develop a cluster of somewhat fleshy roots below the woody crown.

Reproduction and Dispersal: Primarily by seed but root and crown fragments also resprout. Seeds are often sold in seed catalogs or wildflower mixes and may be found in gardens as an ornamental plant.

Joseph M. DiTomaso, UC Davis

Habitat Preferences: Found in fields, roadsides and other open areas. Tolerates partial shade and likes wetter environments, such as irrigated pastures or moist meadows, more than Spotted knapweed.

Manual Treatment: Hand pull or dig entire plant before seed set, removing as much of the taproot as possible to prevent regeneration. If any portion of the flower is beginning to emerge or if seed heads have formed, bag and remove. Wear gloves.

Interesting Facts: May be capable of hybridizing with Yellow starthistle & Diffuse knapweed.

Distribution Map

Musk/Nodding Thistle *(Carduus nutans)*

Winter annual or biennial, growing up to 2.5 meters (8 feet) tall. Forms a rosette in the first year and a flowering stem the second year. Originated in Eurasia or North Africa.

Dr. Shawn Askew, Virginia Tech. Inset: Al Schneider, www.swcoloradowildflowers.com

NATIVE "LOOK-ALIKE" SPECIES

Native thistles generally do not have leaves whose bases extend down and are fused to the stem all the way from node to node. Many native thistles have hairy upper and lower leaf surfaces.

Ben Legler

Cirsium undulatum

QUICK ID

- Solitary reddish-purple flower heads droop, or nod, at maturity
- Purplish bracts below the seed head are broad and bent back
- Spiny wings cover stem where leaves are present

Chris Evans, Invasive.org

Dr. Shawn Askew, Virginia Tech

Dr. Shawn Askew, Virginia Tech

Flowers: Reddish-purple flowers (up to 5 cm in diameter) are solitary at the end of branches. Purplish spiny bracts below the seed head are broad (2 mm wide) and bent back. Stalk directly below the flower head is covered with soft white hairs instead of spiny wings.

Leaves and Stems: Hairless stem leaves have a light midrib, long sharp spines along usually white leaf margins, and are stalkless with bases extending down the stem as spiny wings. Wings present only where leaves exist and not directly below the flower head. Basal rosette leaves up to 30 cm long and often covered with fine, wooly hairs on both surfaces.

Seeds: Single seeded fruits are 4 to 5 mm long, pale yellow to orange-brown with longitudinal dotted stripes. Averages 10,000 seeds per plant with up to 90% viability.

Roots: Large, fleshy taproot is often hollow near the ground surface.

Reproduction and Dispersal: Reproduces by seed only. Dispersed by wind, water, and animals.

Habitat Preferences: Pastures, grasslands, forest lands, crop fields, river valleys, roadsides and disturbed open sites.

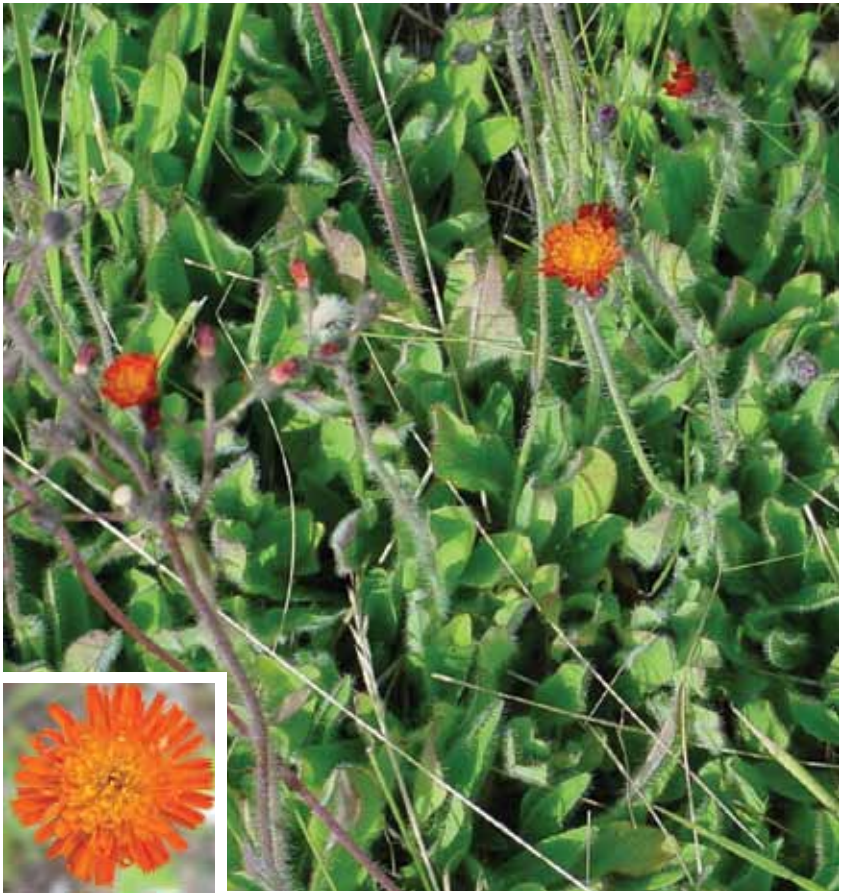
Manual Treatment: Hand pulling with heavy gloves or cutting the tap root at least 5 cm below the soil before flowering prevents seed production and can be effective at reducing populations if done repeatedly throughout the growing season.

Interesting Facts: Similar in appearance to exotic Plumeless thistle but has larger flowers and leaves with a prominent white margin.

Distribution Map

Orange Hawkweed *(Hieracium aurantiacum)*

A 30 cm to 1 meter (1 - 3 feet) tall perennial with above-ground runners, similar to those of strawberries. Introduced from Europe as a garden ornamental.



Richard Old, www.xidservices.com. Inset: Louis-M. Landry

NATIVE "LOOK-ALIKE" SPECIES

Orange mountain dandelion, *Agoseris aurantiaca*, also has milky latex juice but has solitary flowers and is mostly hairless. Many native hawkweeds exist in this ecosystem as well, but all have white or yellow flowers.

Donna Franklin

Agoseris aurantiaca

QUICK ID

- Vibrant orange-red flowers
- Milky latex juice when broken
- Hairy leaves mostly found at base of plant
- Stems mostly leafless with black bristly hairs

Joseph M. DiTomaso, UC Davis

Flowers: Cluster of 5 to 30 dandelion-like, showy, red-orange flower heads. Petals have notched tips.

Leaves and Stems: Entire, hairy leaves in a rosette at the base of the plant. Leaves darker green on top than underneath. Few to no leaves on stem.

Ben Legler

Seeds: Tiny purplish-black seeds with tawny-white, brittle plumes attached on the flattened end.

Roots: Rhizomatous. Shallow fibrous roots with a woody stem base.

Reproduction and Dispersal: By above-ground runner, seeds and roots.

Michael Shephard, Invasive.org

Habitat Preferences: Low to mid-elevations. Disturbed areas, meadows, roadsides, grasslands, forest openings and lawns. Will not tolerate heavy shade.

Manual Treatment: Hand pull entire plant (including runners and roots), cut below ground or cut flower seed head. Mowing prevents seed production but encourages spread by ground runners.

Interesting Facts: Above ground runners create a dense mat that impedes other vegetation. Grazed by sheep, goats, horses, occasionally by cattle, and native grazing animals.

Distribution Map

Oxeye Daisy *(Leucanthemum vulgare)*

Erect, short-lived perennial herb up to 1 meter (3 feet) tall. Often grows in dense clumps due to creeping root system. Introduced from Eurasia as an ornamental and as a contaminant in seed.

Dr. Shawn Askew, Virginia Tech. Inset: Anne Elliott

NATIVE "LOOK-ALIKE" SPECIES

Native Asters, *Aster* spp., and Fleabanes, *Erigeron* spp., such as *Erigeron caespitosus*, resemble Oxeye daisy, but typically have undivided leaf margins, without lobes or teeth. Seeds of Asters and Fleabanes also have a pappus while Oxeye daisy seeds do not.

Amélie Rousseau

Erigeron caespitosus

QUICK ID

- Showy, daisy-like flowers
- Short creeping roots
- Stem leaves have clasping bases; basal leaves are stalked
- Leaves with wavy to lobed margins

MT SNWAEC

Ohio State Weed Lab, Invasive.org

Steven J. Baskauf

Steve Dewey, Invasive.org

Flowers: A single, daisy-like flower head, composed of yellow disk flowers in center surrounded by 20 to 30, notched, white ray flowers, develops on the end of each stem branch. Green floral bracts with brown margins appear in several overlapping rows.

Leaves and Stems: Spoon-shaped basal rosette leaves are 5 to 12.7 cm long, attached to the stem by long narrow stalks, and have wavy, scalloped margins. Stem leaves are arranged in an alternate pattern and progressively reduce in size upward on stem. Upper stem leaves are narrower and lack stalks.

Seeds: Ovate, dark brown to black seeds, 3 mm long. Each plant can produce 500 or more seeds and are viable for 20 years.

Roots: Short, fibrous creeping roots.

Reproduction and Dispersal: By seed, underground creeping roots, and root fragments. Quickly forms dense and expansive populations due to rhizomatous nature.

Habitat Preferences: Found in disturbed areas, fields, meadows, roadsides and forest openings. Tolerates a wide range of environmental conditions.

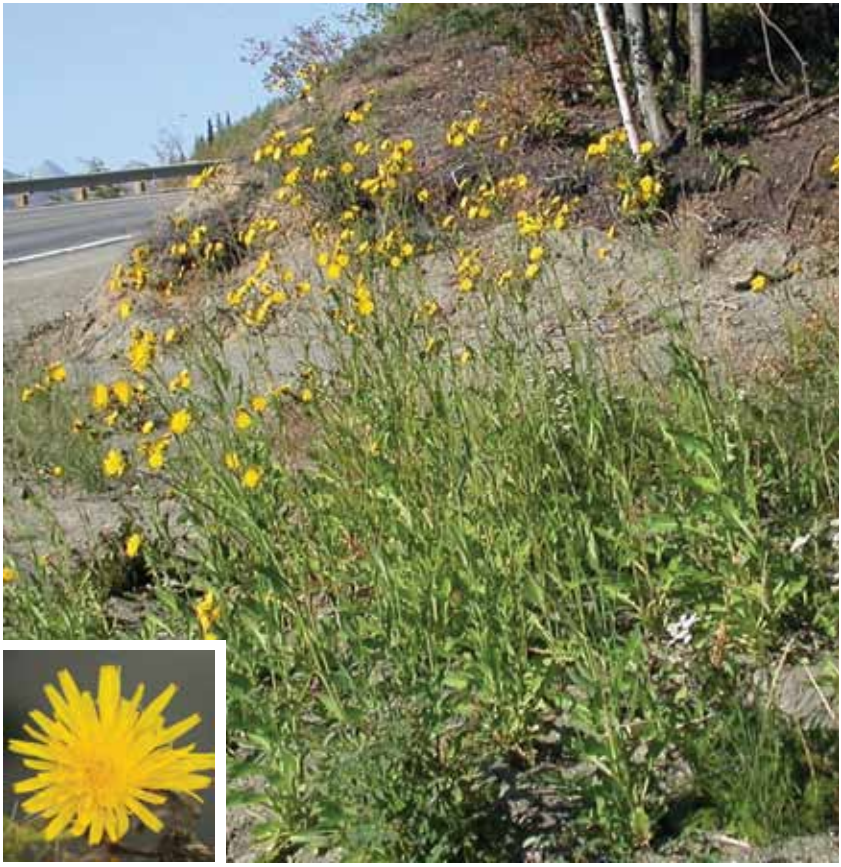
Manual Treatment: Hand pull or dig entire plant before seed set, removing as much of the fibrous roots and rhizomes as possible to prevent regeneration. If flowers have already gone to seed, pick flower heads, bag and remove. Mowing during or after flowering will disperse seeds.

Interesting Facts: Often included in popular seed mixes. Flowers have an unpleasant odor, reminiscent of stale perspiration.

Distribution Map

Perennial Sowthistle *(Sonchus arvensis)*

Erect perennial up to 1.8 meters (6 feet) tall. Native to Eurasia. Most likely introduced as a contaminant in seed crops.



Michael Shepard, Invasive.org. Inset: Ben Legler

NATIVE "LOOK-ALIKE" SPECIES

Pale agoseris, *Agoseris glauca*, has solitary flower heads and entire leaves without prickly margins.

Al Schneider

Agoseris glauca

QUICK ID

- Yellow dandelion-like flower heads
- Dandelion-like leaves w/ prickly margins
- Bracts beneath flowers covered with yellow gland-tipped hairs
- Exudes milky juice when broken

Ben Legler

Richard Old, www.xidservices.com

Richard Old, www.xidservices.com

Flowers: Bright yellow, dandelion-like flower heads, 2.5 to 5 cm across, in loose clusters at top of stems. Up to 20 flower heads per cluster. Flower stalks and bracts below flower heads are usually covered in yellow, gland-tipped hairs.

Leaves and Stems: Foliage exudes bitter, milky juice when broken and is covered with a waxy coat, which can be rubbed off. Succulent, hollow stems are finely grooved and branch near the top. Leaves with prickly margins. Lower leaves stalked, deeply lobed, and dandelion-like. Upper leaves alternate, less deeply lobed, and stalkless.

Seeds: Reddish-brown seeds, 3 mm long, with a wrinkled surface. Can produce 4,000 seeds per plant. Seeds survive about 3 years.

Roots: Yellowish-white creeping roots with milky juice. Deep vertical root.

Reproduction and Dispersal: By seeds and creeping roots. Root system is easily broken and gives rise to new plants from buds on the rhizomes. Seeds are dispersed primarily by wind and also by birds, other animals, and human activities.

Habitat Preferences: Disturbed areas, native plant communities, marshes, ponds, riparian areas, fields, croplands and roadsides. Prefers moist soils and full sunlight, but will tolerate dry conditions.

Manual Treatment: Hand pull young plants before extensive root system develops.

Interesting Facts: Most of the milky juice of perennial sowthistle is oil and may be a potential crop for oil or hydrocarbon production.

Distribution Map

Russian Knapweed *(Acroptilon repens)*

Erect, perennial herb up to 1 meter (3 feet) tall. Longer lived than other knapweeds due to extensive, rhizomatous root system. Forms dense colonies. Introduced from Eurasia in contaminated alfalfa seed.

Steve Dewey, Invasive.org. Inset: Richard Old, www.xidservices.com

"LOOK-ALIKE" SPECIES

Ornamental relatives of knapweed species include *Centaurea montana* and *Centaurea cyanus* (Bachelor buttons). Both **non-natives** have linear leaves with entire margins. These relatives often escape cultivation but do not tend to invade large areas.

Louis-M. Landry

Centaurea cyanus

QUICK ID

- Silvery flower buds open into pinkish-purple flowers
- Papery, green, floral bracts
- Black, scaly, creeping roots
- Wooly, hairy basal leaves

Steve Dewey, Invasive.org

Joseph M. DiTomaso, UC Davis

Richard Old, www.xidservices.com

Flowers: One pinkish-purple, urn-shaped flower head develops on the end of each stem branch. Egg-shaped floral bracts are green at the base, have a whitish papery margin, and are slightly hairy towards the tip.

Leaves and Stems: Coarse; covered with fine hairs that give plant a grayish-green appearance. First year basal rosette has wavy or deeply-lobed leaves, up to 10 cm long. Flowering stalks with alternate leaves grow from rosette in second year. Narrow upper stem leaves with toothed margins that are attached directly to the stem.

Seeds: Flattened, egg-shaped, ivory seeds; 3 to 4 mm long. Not a prolific seed producer.

Roots: Rhizomatous with a vigorous root system. Can grow to depth of 7.6 meters (25 feet). Creeping adventitious shoots branch off the heavily scaled, black, bark-like roots, enabling plant to spread rapidly.

Reproduction and Dispersal: Primarily by creeping roots (rhizomes).

Habitat Preferences: Found in fields, roadsides, cultivated lands and other open areas. Often found in poorly-drained and saline or alkaline soils. Does not tolerate dense shade.

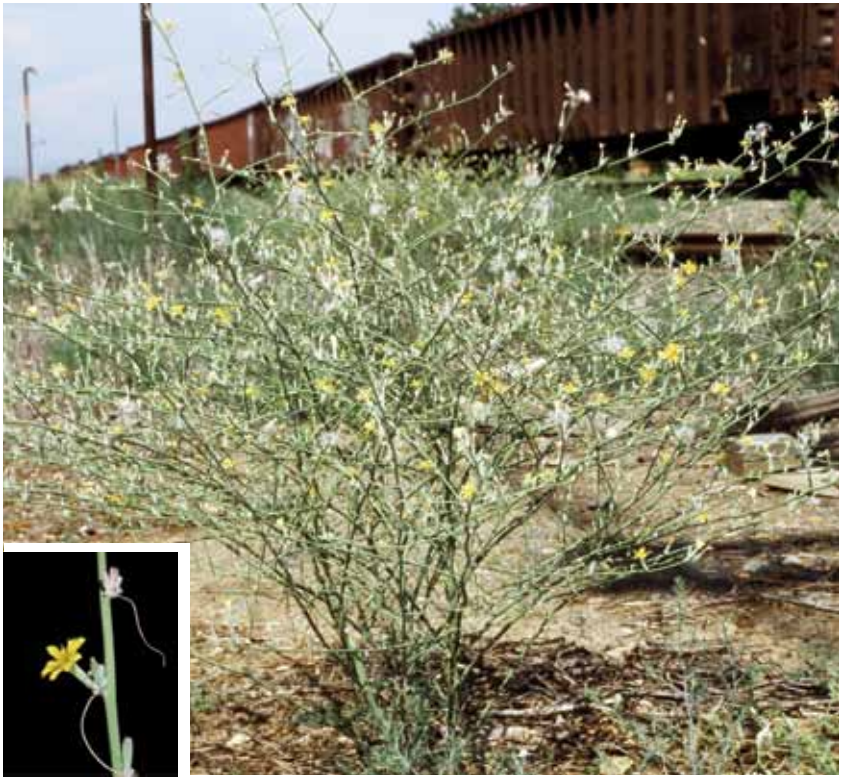
Manual Treatment: Hand pull or dig entire plant before seed set, removing as much of the root system as possible. Wear gloves. Hand pulling, cutting, or mowing may control but will not eliminate infestations.

Interesting Facts: Smooth-tipped bracts & blackish, scaly creeping roots distinguish it from other knapweeds.

Distribution Map

Rush Skeletonweed *(Chondrilla juncea)*

Erect, long-lived perennial up to 1.2 meters (4 feet) tall. Three forms of the plant exist in the United States, each differing in flower characteristics and susceptibility to control measures. Native to Eurasia.



Joseph M. DiTomaso, UC Davis. Inset: Joseph M. DiTomaso, UC Davis

NATIVE "LOOK-ALIKE" SPECIES

Fiddleleaf hawksbeard, *Crepis runcinata*, is a perennial common in meadows, grasslands and around wetlands. Like Rush skeletonweed, it has yellow flowers, milky sap, and a dandelion-like rosette, but it has a greater number of ray flowers (20 - 50).

Steve Matson

Crepis runcinata

QUICK ID

- Small yellow flowers scattered along branches
- Overall skeleton-like appearance
- Dandelion-like basal rosette leaves
- Reddish down-turned hairs at stem base

Clayton J. Antieau

Flowers: Single, or clusters of 2 to 5, scattered, yellow flower heads. Seven to 15 ray flowers clustered into a dandelion-like flower head. Ray flowers ("petals") are flat across the end and terminate with distinct lobes.

Leaves and Stems: Foliage exudes a milky juice when cut or broken. A dandelion-like basal rosette with hairless leaves emerges upon germination, then withers as flower stem develops. Wiry, many branched stems have downward pointing, coarse, reddish hairs on bottom four inches of stem. Stem leaves are narrow, linear, and often inconspicuous.

Richard Old, www.xidservices.com

Seeds: Light brown to black, ribbed seeds are about 3 mm long. Mature plants can produce up to 20,000 seeds per plant. Seeds require rainfall to establish.

Roots: Extensive, deep taproot can reach 2.5 meters, with occasional lateral root formation.

Richard Old, www.xidservices.com

Reproduction and Dispersal: Disperses by seed and lateral root buds. Seeds are primarily dispersed by wind. Root fragments scattered by cultivation can also aid in spread.

Habitat Preferences: Found in well-drained sandy or rocky soils in disturbed areas, cultivated areas, rangelands, pastures and roadsides. Rarely invades healthy native plant communities.

Manual Treatment: Diligent hand pulling can provide effective control of very small infestations if all parts of plant are pulled two to three times per year for 6 to 10 years. Mowing and cultivation are ineffective and may actually increase the infestation.

Interesting Facts: Competes with other plants for soil moisture and nutrients (esp. nitrogen).

Distribution Map

Scentless Chamomile *(Tripleurospermum perforatum)*

Erect to semi-erect, short-lived, annual, biennial, or occasionally perennial herb from 15 cm (6 inches) to over 1 meter (3 feet) tall. Plants can be very bushy. Introduced from northern Europe and western Asia.

Ben Legler. Inset: Ben Legler

"LOOK-ALIKE" SPECIES

The similar looking flowers of **non-native** Oxeye daisy, *Leucanthemum vulgare,* can be confused with Scentless chamomile, but the leaves of Oxeye daisy are spoon-shaped and have wavy, scalloped margins.

www.floracyberia.net

Leucanthemum vulgare

QUICK ID

- White, daisy-like flowers
- Leaves & flowers odorless when crushed
- Leaves divided into narrow, thread-like segments
- Extensive fibrous taproot

Richard Old, xidservices.com

Ben Legler

Kelly Cooley

Flowers: A single, daisy-like, flower head develops on the end of each stem branch. Yellow centers composed of compact clusters of disk flowers; white "petals" are actually ray flowers. Flowers are nearly odorless when crushed. Floral bracts are numerous and arranged in several overlapping rows.

Leaves and Stems: Flowering stems emerge from a basal rosette. The stems are smooth, often reddish-purple, and highly branched near the top, creating a bushy appearance. Basal leaves similar in appearance to carrot leaves. Stem leaves are alternate, very finely divided, and have a feathery overall appearance.

Seeds: Rectangular, dark brown seeds; 2 mm long. A single plant can produce 10,000 - 400,000 seeds.

Roots: Extensive fibrous taproot.

Reproduction and Dispersal: Entirely by seed. Seeds typically fall close to parent plant or are carried short distances by wind. Can be moved longer distances by water.

Habitat Preferences: Found in disturbed areas, fields, meadows, roadsides, forest openings and dry shorelines. Can germinate and persist under periodic flooding conditions. Tolerates a wide range of environmental conditions but does not compete well in vigorous, undisturbed native plant areas.

Manual Treatment: Hand pulling or digging before seed production is effective. Remove as much of the fibrous roots and rhizomes as possible. If flowers have already gone to seed, pick flower heads, bag and remove.

Interesting Facts: Scentless chamomile is commonly sold in wildflower seed mixes.

Distribution Map

Spiny Plumeless Thistle *(Carduus acanthoides)*

Winter annual or biennial, growing up to 1.2 meters (4 feet) tall, forms a rosette in the first year and a flowering stem the second year. Introduced from Eurasia.

Biopix.dk. Inset: Biopix.dk

"LOOK-ALIKE" SPECIES

Similar in appearance to **non-native** Musk thistle, *Carduus nutans*, but differs by having spiny wings densely covering stem, smaller flowers (less than 3 cm in diameter), and leaves lacking a prominent white margin. Musk thistle and Plumeless thistle can hybridize.

Kelly Cooley

Carduus nutans

QUICK ID

- Reddish-purple flower heads
- Stem leaves hairy only on underside
- Spiny wings densely covering stem up to base of flower heads
- Narrow bracts below the seed head appear as sharp spines

Biopix.dk

Steve Dewey, Invasive.org

Joseph M. DiTomaso, UC Davis

Flowers: Reddish-purple flowers (less than 3 cm in diameter) are either solitary or in clusters of two to five. Narrow bracts below the seed head appear as sharp spines.

Leaves and Stems: Leaves have hair only on the underside, spines along the leaf margin, and a light midrib. Stem leaves are stalkless, extend down the stem like spiny wings. The stems are branched near the top and are densely covered with these spiny wings up to base of flower heads. Rosette leaves are deeply serrated nearly to the midrib.

Seeds: Single seeded fruits are 2 to 3 mm long, light brown with faint longitudinal stripes, and have a plume (pappus) with bristles 11 to 12 mm long.

Roots: Large, fleshy taproot.

Reproduction and Dispersal: Reproduces by seed only. Dispersed primarily by wind. Extremely prolific seed producer; up to 9,000 seeds per plant.

Habitat Preferences: Pastures, grasslands, crop fields, river valleys, roadsides and disturbed open sites.

Manual Treatment: Hand pulling with leather gloves or cutting the tap root at least two inches below the soil line before flowering prevents seed production and can be effective at reducing populations if done repeatedly throughout the growing season.

Interesting Facts: Unpalatable to grazing animals.

Distribution Map

Spotted Knapweed *(Centaurea stoebe/biebersteinii)*

An erect, short-lived perennial or biennial up to 1.2 meters (4 feet) in height. Introduced from Eurasia in contaminated alfalfa and clover seed.

Michael Shepard, Invasive.org. Inset: Gary Fewless

NATIVE "LOOK-ALIKE" SPECIES

The rosettes of many native members of the Sunflower family, such as Blanketflower, *Gaillardia aristata*, are similar in appearance to knapweed rosettes. The two plants are very easy to distinguish during flowering.

Mary Ellen Harte, Invasive.org

Gaillardia aristata

QUICK ID

- Pinkish-purple flowers
- Grayish-green stem and leaves
- Floral bracts have brown, triangular tips with comb-like fringe
- Seed head persists until following year

Joseph M. DiTomaso, UC Davis

Gary Fewless

Steve Dewey, Invasive.org

Barry A. Rice, The Nature Conservancy

Flowers: One pinkish-purple (sometimes white), urn-shaped flower head, comprising of 30 to 50 disk flowers, develops on the end of each stem branch.

Leaves and Stems: Coarse; covered with transluscent resin dots and fine hairs. First year basal rosette has deeply-lobed leaves. Flowering stalks with deeply-lobed, alternate leaves grow from rosette in second year. Short, narrow upperstem leaves. Stems on mature plants have many branches. Bitter to taste.

Seeds: Brownish or black seeds, 3 mm long. Seeds are notched on one side of the base and have a short tuft of bristles at the tip. A single plant can produce up to 40,000 seeds.

Roots: Deep, stout taproot that helps plant compete for water and nutrients.

Reproduction and Dispersal: Primarily by seed but root fragments also resprout. Seeds that do not germinate form a seedbank in the soil and may remain viable for eight or more years.

Habitat Preferences: Found in disturbed areas, fields, roadsides, and other open areas. Prefers well-drained, light-textured soils that receive summer rainfall and ample sunlight. Does not tolerate dense shade.

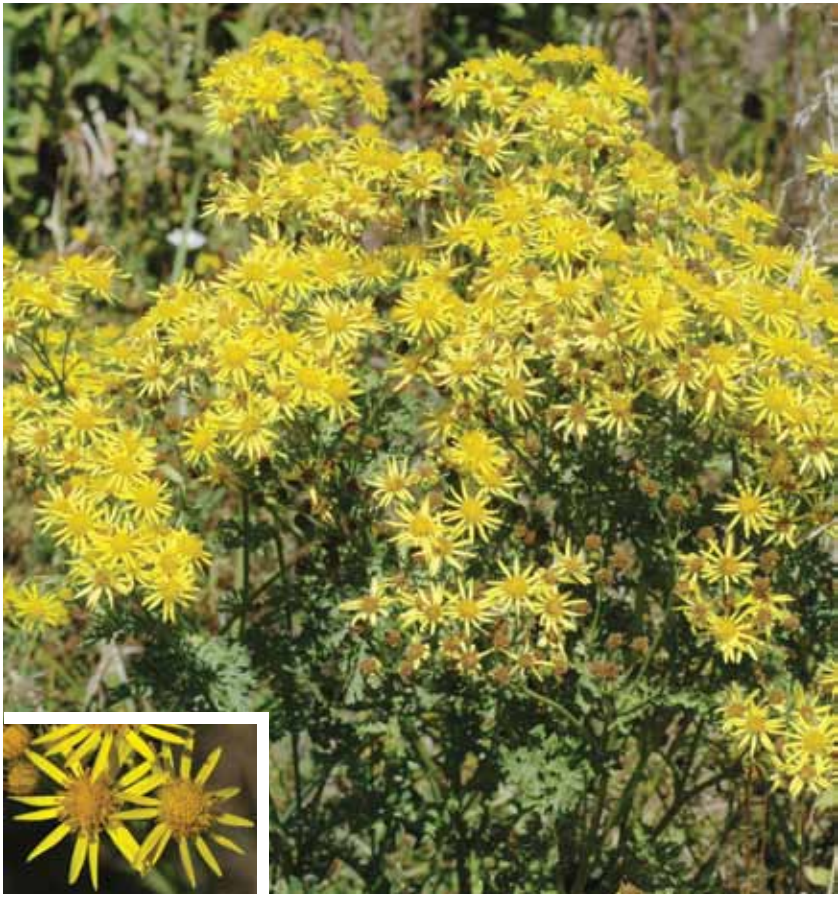
Manual Treatment: Hand pull or dig entire plant before seed set, removing as much of the taproot as possible to prevent regeneration. If any portion of flower is begining to emerge or if seed heads have formed, bag and remove. Wear gloves.

Interesting Facts: Exudes a chemical called catechin into the soil, which prevents the

Distribution Map

Tansy Ragwort *(Senecio jacobaea)*

Erect biennial, or occasionally annual or short-lived perennial, generally 30 cm to 1 meter (1 - 3 feet) tall. Occasionally up to 1.8 meters tall. Native to Eurasia.



Ben Legler. Inset: Ben Legler

NATIVE "LOOK-ALIKE" SPECIES

Tansy ragwort can be distinguished from Wooly groundsel, *Senecio canus*, by its twice lobed leaves, 13 ray flowers and 13 bracts, and by having evenly distributed stem leaves.

Amelie Rousseau

Senecio canus

QUICK ID

- Clusters of yellow daisy-like flowers
- Stems and leaf stalks often purple
- Rosettes have 10 to 20 leaves with web-like hairs
- Crushed leaves have unpleasant odor

Ben Legler

Ben Legler

Joseph M. DiTomaso, UC Davis

Flowers: 20 to 60 daisy-like flower heads, one inch across, with a yellow center of disk flowers and 10 to 15 ray flowers. Has a dense, flat-topped cluster at the top of stems. 10 to 15 bracts below the flower heads are black-tipped and arranged in a single row.

Leaves and Stems: Rosette and stem leaves are covered with cottony web-like hairs. First year rosette has 10 to 20 leaves, 5 to 25 cm long. One to several purple, branching stems develop in the second year. Stem leaves are alternate, evenly distributed along the stem, and decrease in size and stalk length at top of stem.

Seeds: Light brown, cylindrical, slightly ribbed seeds, 1.5 to 3mm long with a pappus of soft white bristles attached to the tip.

Roots: Small taproot with fibrous roots and fleshy lateral roots.

Reproduction and Dispersal: Primarily by seed. Dispersed by wind, water, animals, vehicles and human activities. Root fragments can also resprout. Viable for 20 years.

Habitat Preferences: Disturbed areas, riparian areas, forests (especially after logging or clear-cutting), fields, croplands, roadsides. Prefers well drained soils.

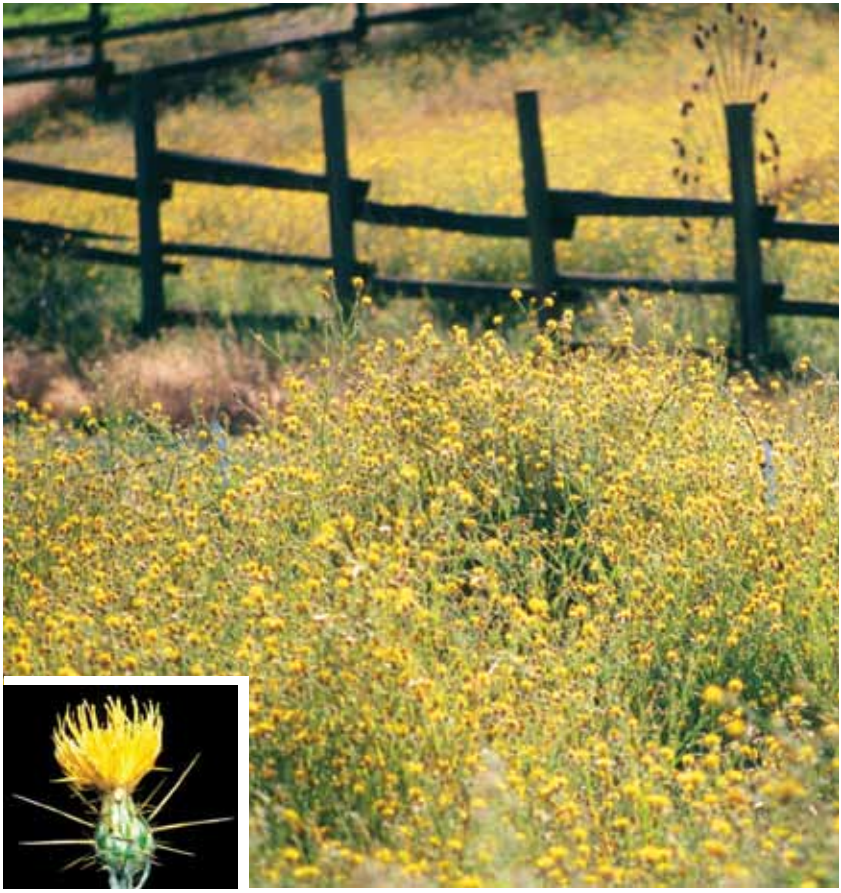
Manual Treatment: Hand pull when soils are moist. Mulch area after pulling to block light. Repeated hand cutting or mowing before flowering prevents seed production but may enhance survival by stimulating vegetative reproduction.

Interesting Facts: Causes irreversible liver damage if ingested in large quantities or in small amounts over a long period of time.

Distribution Map

Yellow Starthistle *(Centaurea solstitialis)*

Erect, winter hardy, annual herb up to 1.5 meters (5 feet) tall. Forms impenetrable stands. Introduced from Europe in contaminated alfalfa.



Steve Dewey, Invasive.org. Inset: Barry A. Rice, The Nature Conservancy

NATIVE "LOOK-ALIKE" SPECIES

Blazing stars, *Mentzelia* spp., which can also be found in open habitats with dry soils, have a similar overall appearance, but can be distinguished by the presence of large showy petals and the lack of sharp stiff spines on the bracts.

Amélie Rousseau

Mentzelia laevicaulis

QUICK ID

- Bright yellow flowers
- Wing-like leaves run down length of stem
- Hairy "cotton ball" seed head persists throughout winter
- Long sharp spines radiate from bracts

Richard Old, www.xidservices.com

Flowers: One yellow flower on the end of each stem. Floral bracts have sharp, stiff, straw-colored spines that radiate outward in a star-like pattern. Below these is a pair of short lateral spines covered in cotton-like hair.

Barry A. Rice, The Nature Conservancy

Leaves and Stems: Basal rosette leaves are deeply lobed and pointy tipped, similar to dandelion rosette. One main flowering stalk. Rigid stems are coarse and covered with cottony hairs. Stem leaves are vertical, flat extensions along the stem. Upper leaves are entire and sharply pointed, becoming progressively smaller toward top of plant.

Seeds: Produces two types: seeds with fluffy plume and seeds without. After dispersal, a fuzzy cotton ball remains on end of stem. Large plants can produce nearly 75,000 seeds.

Roots: Deep, stout taproot, 1.8+ meters in length.

Richard Old, www.xidservices.com

Reproduction and Dispersal: By seed. Most seeds fall within a four foot radius of the parent plant. Seeds travel by soil movement, water, animals, humans, machines and vehicles, or by use of commercial seed.

Habitat Preferences: Best adapted to open grasslands with deep, well drained soils but also capable of establishing on shallow, rocky soils with minimal rainfall. Does not tolerate dense shade.

Manual Treatment: Hand pulling can be effective if entire plant is removed, including taproot. Wear gloves. Bag and remove flowers or seed heads. Minimize soil disturbance. Follow up treatments will be required each year. **Report immediately.**

Interesting Facts: Destroys livestock rangelands.

Distribution Map

Blueweed *(Echium vulgare)*

Erect biennial to short-lived perennial herb up to 1 meter (3 feet) tall. Introduced from North Africa as a garden ornamental.

Kelly Cooley, Inset: Louis-M. Landry

NATIVE "LOOK-ALIKE" SPECIES

Shining penstemon, *Penstemon nitidus*, a native plant found in grasslands and rock outcrops, can be distinguished by its smooth, hairless foliage and waxy, opposite leaves.

GNP Archives

Penstemon nitidus

QUICK ID

- Purplish-blue, funnel-shaped flowers
- Flowers on the upper side of short arching branches
- Seed stalk resembles a viper's head
- Entire plant bristly/hairy

Michael Lemmer, www.naturkamera.de

Flowers: Numerous bright, purplish-blue (occasionally white or pink), funnel-shaped flowers arranged on the upper side of short arching branches. Five petals. Buds are reddish-purple before opening.

Leaves and Stems: First year basal rosette radiates from central point. Rosette leaves have entire margins, taper toward stalk, and are rounded at the tips. Flowering stalks grow from the rosette during the second year. Stem leaves are lance-shaped with entire margins, and are alternately arranged. Stem hairs are painful to touch.

Louis-M. Landry

Seeds: Fruit is a cluster of four angular, wrinkled seeds that are grayish-brown when mature. Each plant may produce up to 2,800 seeds.

Roots: Stout, black taproot with smaller, fibrous, lateral roots. Reaches 60 cm (2 feet) long.

Reproduction and Dispersal: By seed. Most seeds fall close to the parent plant but seeds also travel through infested gravel, water, animals, heavy machinery and vehicles, or by use of commercial seed or hay.

Michael Lemmer, www.naturkamera.de

Habitat Preferences: Found in gravelly riparian areas, roadsides, pastures, and meadows at low to mid-elevations. Well-adapted to dry, rocky, sandy or shallow soils, especially glacial till.

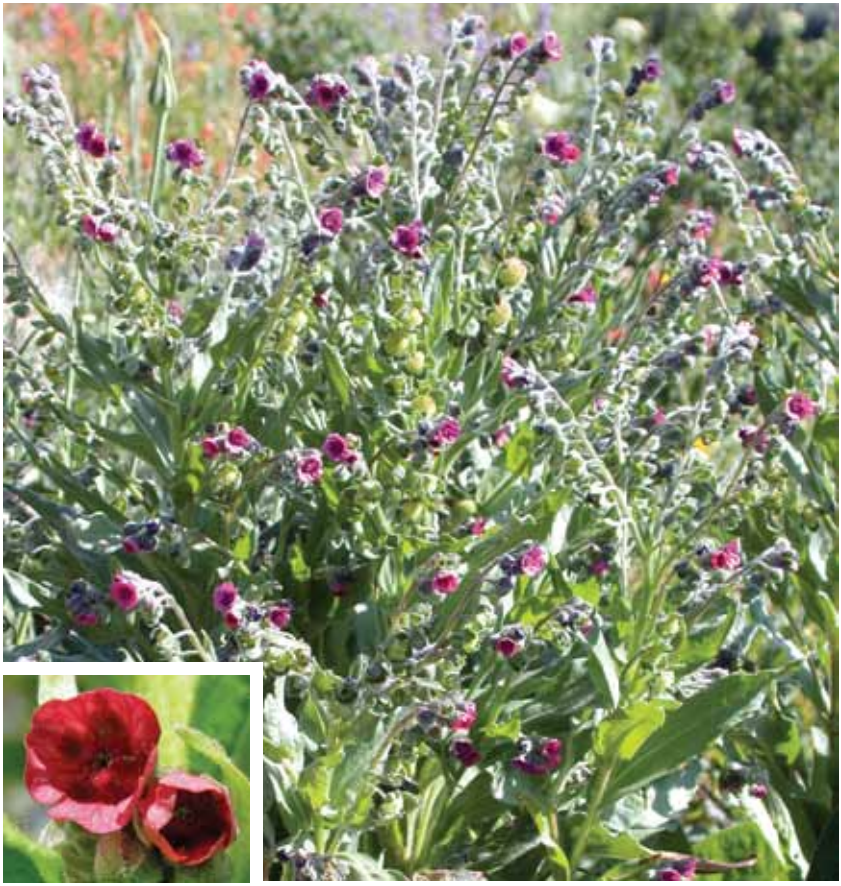
Manual Treatment: Hand pulling or digging is effective; best done when soil is moist. Wear gloves, avoid skin contact. If any portion of flower is beginning to emerge, or if seed heads have formed, pick, bag, and remove.

Interesting Facts: Typically not eaten by grazing animals and thus increases in overgrazed pastures.

Distribution Map

Houndstongue *(Cynoglossum officinale)*

A biennial or short-lived perennial 30 cm to 1.2 meters (1 - 4 feet) tall. Produces a rosette during the first year and a flowering stem during the second year. Introduced from Europe.



Invasive.org. Inset: Werner Eigelsreiter

NATIVE "LOOK-ALIKE" SPECIES

Many native bluebells species can be confused with Houndstongue. *Mertensia oblongifolia* is the largest and is the most comparable but *M. longiflora and M. rinidus* are two, smaller native bluebells that also may look similar.

Ben Legler

Mertensia oblongifolia

QUICK ID

- Reddish-purple flowers with five petals
- Soft hairy rosette of leaves in first year
- Bur-like seeds stick to fur and clothing

Dr. Amadej Trnkoczy

Flowers: Reddish-purple flowers in terminal branches with five petals, united at the base.

Leaves and Stems: Rough, hairy/velvety, 2.5 to 30 cm-long leaves with entire margin (lacking teeth or lobes). Alternate leaves in second year. Erect hairy stem, usually branched near the top. May produce a single flowering stem or multiple stems per plant.

Joseph M. DiTomaso, UC Davis

Seeds: Fruit is composed of four prickly, flattened, bur-like nutlets (seeds) that are green when immature and roughly the size of a corn kernel. Seeds turn brown and become adhesive when mature, readily clinging to clothing or animals.

Roots: Woody taproot.

Werner Eigelsreiter

Reproduction and Dispersal: By seed. "Hitchhiking" seeds can easily be spread great distances by animals and humans. Mature plants can produce hundreds of seeds per year. Viable for 2 to 3 years.

Habitat preferences: Shade tolerant. Open forested and meadow areas, along roads and trails, disturbed areas.

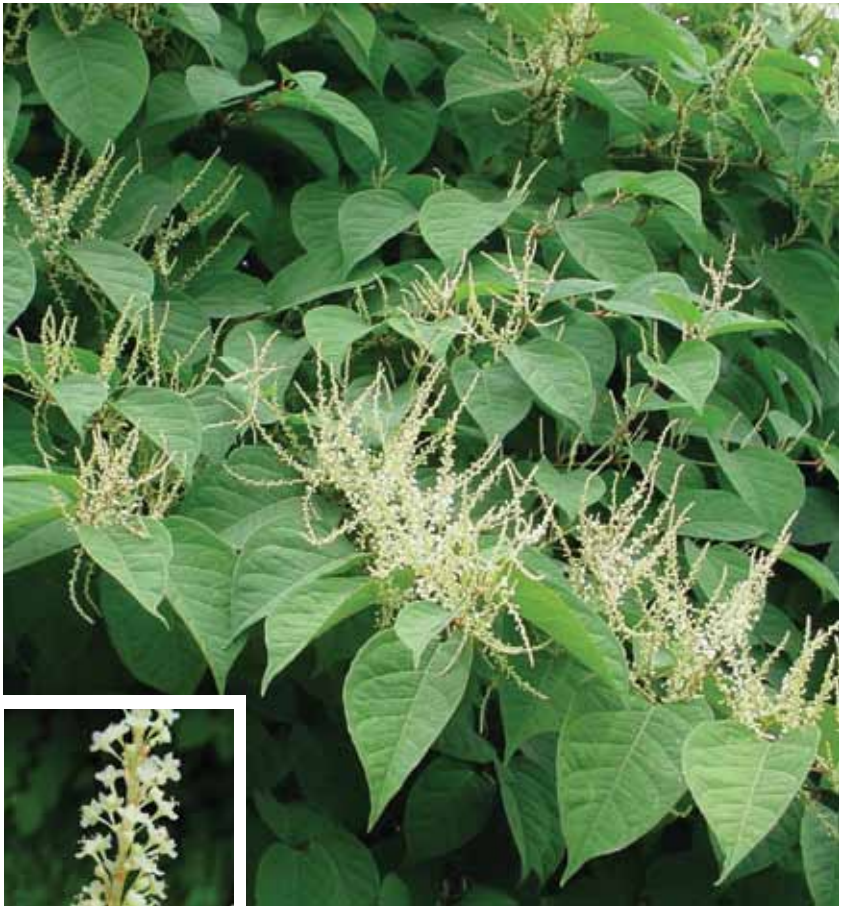
Manual Treament: Hand-pull plants and/or remove flowering stems before seed-set (by mowing or picking). Wear gloves to prevent skin irritation.

Interesting facts: Contains toxic alkaloids that cause liver cells to stop reproducing. Also contains alantoin, a compound that has been used to treat ulcers on the skin and in the intestine.

Distribution Map

Japanese Knotweed *(Polygonum cuspidatum)*

Erect perennial 1.3 to 2.7 meters (4 - 9 feet) tall. Grows in clumps with 40 or more stems per clump. Introduced from Asia as an ornamental.



Richard Old, www.xidservices.com. Inset: Richard Old

NATIVE "LOOK-ALIKE" SPECIES

Black elderberry, *Sambucus racemosa*, also has hollow spotted stems clustered with white flowers. Distinguished from Japanese knotweed by opposite branches, leaves divided into 5 to 9 sharply toothed leaflets, and clusters of dark red fruits.

Dave Powell, Invasive.org

Sambucus racemosa

QUICK ID

- Hollow, bamboo-like stems with spots
- Creamy-white flowers in clusters from leaf joints
- Heart-shaped leaves are lighter green on underside
- Forms dense thickets

Ben Legler

Joseph M. DiTomaso, UC Davis

Amelie Rousseau

Flowers: Creamy white flowers in large plume-like clusters at leaf axil. Composed of five slightly fused, sepal-like petals. Petals are lacking. Papery cup-like bracts surround the flowering stalk at each joint.

Leaves and Stems: Stout, hollow stems with reddish-brown spots at maturity. Nodes (or stem joints) are slightly swollen and surrounded by thin sheaths; usually fringed at the top. Alternate, heartshaped, leathery leaves, 5 to 15 cm, on short stalks.

Seeds: Three-sided fruits with narrowly winged sepals. Seeds are glossy, brown/black.

Roots: Creeping rhizomes usually 5 to 6 meters (16 - 20 feet) long.

Reproduction and Dispersal: Primarily from rhizomes and stems; also by seed. Rhizomes and stem fragments disperse with water currents, flooding, and with natural or human-facilitated soil movement. Fruits disperse by wind.

Habitat Preferences: Disturbed areas, riparian areas, wetlands, roadsides, pastures and ditches. Prefers moist soils.

Manual Treatment: Cutting the stalks at least three times per growing season for several years and covering with black plastic or shade cloth may be effective at depleting energy reserves in rhizomes.

Interesting Facts: Young shoots, stems, and rhizomes are edible. Resveratrol, a nutritional supplement, is derived primarily from Japanese knotwood.

Distribution Map

Tall Buttercup *(Ranunculus acris)*

Perennial up to 1 meter (3 feet) tall. Originated in Europe.

Biopix.dk. Inset: Michael Lemmer, www.naturkamera.de

NATIVE "LOOK-ALIKE" SPECIES

Many native buttercups appear similar to Tall buttercup. One native species, *Ranunculus macounii*, has a similar overall appearance, but has leaves that are divided into three stalked, spade-shaped leaflets, each deeply 3-lobed with toothed margins.

Jamie Fenneman

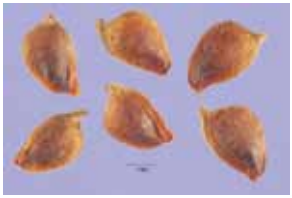
Ranunculus macounii

QUICK ID

- Bright yellow flowers on long stalks
- Stem leaves with three deeply cut lobes
- Plant covered with prominent soft hairs
- Long, erect stems

Ben Legler

Dr. Amadej Trnkoczy



Steve Hurst

Flowers: Golden-yellow, saucer-shaped flowers with five glossy petals, on long stalks. Flowers are 19 to 25 mm diameter and have a greenish center. Green sepals underneath flower petals are hairy and drop off soon after flowering.

Leaves and Stems: Leaves near the base are on long stalks, deeply divided into 3 to 5 lobes then divided again into 2 to 3 narrow, pointed segments. Stem leaves are smaller, short-stalked, uppermost leaves reduced to 3 or 4 narrow segments. Stem and basal leaves are covered with soft hairs on both sides.

Seeds: Seed pod is a hairless, globe-shaped cluster of 20 to 40 tiny curved beaks. Disc-shaped, reddish-brown seeds, with a short hook.

Roots: Thick, fleshy, fibrous roots.

Reproduction and Dispersal: By seeds that are easily carried by water.

Habitat Preferences: Along creeks, wet ditches, in meadows, pastures, and other open disturbed or undisturbed sites with moist to well-drained soil.

Manual Treatment: Hand pull or dig entire plant, keeping soil disturbance to a minimum. Wear gloves and long sleeves to prevent blistering and redness from plant's juices.

Interesting Facts: Often found in overgrazed pastures because livestock find it unpalatable. Contains a bitter juice that causes inflammation. The poisonous property is lost when plant is dried, as in

Distribution Map

Wild Caraway *(Carum carvi)*

Upright, erect plant up to 1 meter (3 feet) tall. Biennial or occasionally perennial. Rosette leaves difficult to notice until emergence of second year flowering stalk. Brought from Eurasia as a cultivated species.

Biopix.dk. Inset: Biopix.dk

NATIVE "LOOK-ALIKE" SPECIES

Many other members of the Carrot family, such as Yampah, *Perideridia gairdneri*, are similar in overall appearance. Yampah leaves are divided into 4 to 12 cm linear segments.

Don Knoke

Perideridia gairdneri

QUICK ID

- Leaves similar to carrot leaves
- Small white flowers
- Upper leaves slender with a lacy appearance
- All parts aromatic when crushed

Biopix.dk

Flowers: Small, white, occasionally pink flowers with five petals; occur in compound umbels, or umbrella-like clusters at the top of flowering stalks.

Leaves and Stems: Fern-like leaves are similar to carrot leaves; alternately arranged on the stem. Upper leaves are lacy, finely divided into slender segments. Smooth, furrowed stems are hollow and lack spots. Several unbranched stems arise from a single plant.

Mary Ellen Harte, Invasive.org

Seeds: Fruits have a distinct odor. When dry, oblong fruits split into two seeds. Seeds are narrow, oblong and brown with five conspicuous linear ribs.

Roots: Narrow taproot is an edible tuber.

Reproduction and Dispersal: Spreads rapidly by prolific seed production. Brittle seed heads shatter upon contact, dispersing seeds. Hay harvested in infested areas causes dispersal.

Steve Hurst

Habitat Preferences: Moist, disturbed meadows, croplands, and along irrigation ditches and roadways from lowland to mountain elevations. Grows in a wide range of soil types and tolerates spring flooding and light frosts.

Manual Treatment: Hand-pulling or cutting during flowering is effective at preventing seed production. If hand pulling is done after seed set, place a plastic bag over the plant and close it tightly over the stem while pulling.

Interesting Facts: Wild caraway is used medicinally to treat bronchitis and increase appetite. Grown commerically as a specialty crop; fruits are ground and used as a spice.

Distribution Map

Dalmatian Toadflax *(Linaria dalmatica)*

Rhizomatous perennial up to 1.2 meters (4 feet) tall. Usually found in patches due to creeping roots. Introduced as an ornamental from southeastern Europe.

Ben Legler. Inset: Werner Eigelsreiter

NATIVE "LOOK-ALIKE" SPECIES

Bastard toadflax, *Comandra umbellatum*, has similar waxy, bluish-green foliage but has white or greenish flowers with five petal-like sepals.

Merel Black

Comandra umbellatum

QUICK ID

- Bright yellow flowers with a long spur
- Alternate, waxy, heart-shaped leaves
- Leaves are a whitish or bluish shade of green
- Flowers have an unpleasant odor

Ben Legler

Flowers: Bright, showy, yellow flowers, 5 cm long; downward spur, fuzzy orange spot on lower lip. Short stalks arranged in elongated cluster at the top of flowering stalk.

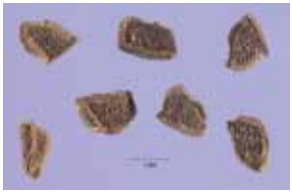
Leaves and Stems: Smooth, hairless foliage has a waxy or rubbery feel, whitish blue. Heart shaped leaves with entire margins. Alternately or spirally arranged. Stems may be unbranched or form dense branching.

Joseph M. DiTomaso, UC Davis

Seeds: Fruit is egg-shaped with two cells that contain several seeds. Seeds are brown and sharply angular or pyramid-like with ridges. Remains viable for up to ten years.

Roots: Rhizomatous. Woody, well branched roots may grow several meters long. Horizontal creeping rhizomes have regenerative buds.

Reproduction and Dispersal: By seeds, rhizomes (creeping roots). Most seeds fall close but can be dispersed over short distances by wind. Animals and birds eat fruits, dispersing seeds over longer distances.



Steve Hurst

Habitat Preferences: Prefers dry, sandy, burned, or gravelly soils. Roadsides, pastures, grasslands, forest clearings, and disturbed or cultivated areas. Rapidly colonizes open sites.

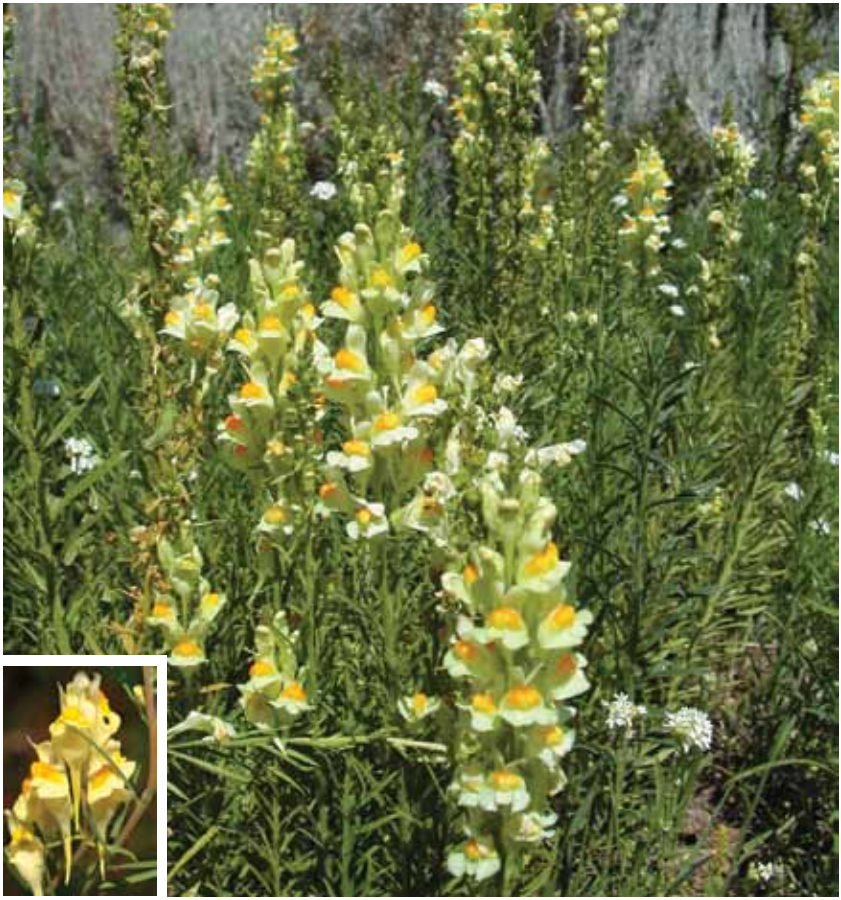
Manual Treatment: Removing upper plant prior to seed set reduces seed production. Repeatedly hand pull young plants. Waxy leaf surface impedes herbicide uptake.

Interesting Facts: Contains a glucoside that is mildy toxic although poisoning is rare as plant in generally considered unpalatable to grazing animals.

Distribution Map

Yellow Toadflax *(Linaria vulgaris)*

Rhizomatous perennial up to 1 meter (3 feet) tall. Introduced from Eurasia in the mid-1800s as an ornamental, fabric dye, and folk remedy.



MT SNWAEC. Inset: Dr. Amadej Trnkoczy

NATIVE "LOOK-ALIKE" SPECIES

The foliage of *Lithospermum ruderale*, commonly called Lemonweed or Stoneseed, is similar in appearance but is hairy instead of smooth. It has small, pale yellow to greenish, five-lobed flowers.

Don Knoke

Lithospermum ruderale

QUICK ID

- Bright yellow flowers with orange spots
- Stems with numerous narrow leaves
- Alternate, pale green leaves are pointed at both ends
- Flowers have an unpleasant odor

Anne Elliott

Ben Legler

Ben Legler

Flowers: Bright, showy, yellow flowers are attached by short stalks, fuzzy orange spot on the lower lip. Flowers have a prominent upper and lower lip; long narrow spur. Arranged in a dense elongated cluster, or terminal raceme.

Leaves and Stems: Smooth, hairless foliage is a pale shade of green. Long, linear, narrow leaves are pointed at both ends; attached directly to stem. Several stems emerge from each rootstock.

Seeds: Seeds are brown to black and flattened. Viable for eight years.

Roots: Rhizomatous, woody, well branched roots may grow several meters long. Horizontal creeping rhizomes have regenerative buds.

Reproduction and Dispersal: By seeds and rhizomes. Most seeds fall close to parent plants but seeds can be dispersed over short distances by wind and longer distances by birds that eat the fruits.

Habitat Preferences: Prefers moist, rich soils; roadsides, pastures, stream and river banks, grasslands, forest clearings, and disturbed or cultivated areas. Aggressive competitor in grasslands and burned areas.

Manual Treatment: Removing the above-ground portion of the plant prior to seed set reduces seed production. Repeated hand pulling can be effective if done for up to ten years.

Interesting Facts: Also known as "butter and eggs." Leaves and stems look extremely similar to another exotic, Leafy spurge. Yellow toadflax, however, lacks a milky latex.

Distribution Map

Flowering Rush *(Butomus umbellatus)*

Moderately tall (up to 1.2 meters, or 4 feet, above water surface), aquatic perennial that grows on shorelines or submerged in water. May form dense stands. Introduced from Eurasia.

Biopix.dk. Inset: Louis-M. Landry

NATIVE "LOOK-ALIKE" SPECIES

Native Bur-reed, *Sparganium* spp., species have similar leaves and growth habit, but are very distinguishable when Flowering rush is in flower.

Susan McDougall

Sparganium spp.

QUICK ID

- Tall rush-like perennial
- Showy flowers with three white or pale pink petals
- Leaves are triangular in cross-section
- Found on shorelines or in water

Biopix.dk

Flowers: Numerous showy flowers with three petals, ranging from deep pink to white. Arranged in a large umbel atop a leafless stem. Three brownish bracts are found at the base of the umbel. Flowers have scent of bitter almonds.

Ben Legler

Leaves and Stems: Leaves and stems are triangular in cross-section. Parallel-veined leaves originate in two rows on opposite sides of the base of the rhizome, have smooth edges, and twisted ends; leaves above the water are stiff and sword-shaped. Submerged leaves are limp.

Seeds: Flowers produce dark brown, beaked fruits, each with numerous seeds.

Roots: Thick creeping rhizomes.

Ben Legler

Reproduction and Dispersal: Dispersed locally by rhizomes or root pieces transported by flowing water. Seed dispersal is possible, but not common. Flowering rush is commonly dispersed over longer distances by boaters, animals, and people.

Habitat Preferences: Ponds, streams, rivers, lakes, wetlands, ditches and canals near shorelines; prefers slowly moving water up to three meters deep. Decreased water levels may result in infestation.

Manual Treatment: Cutting below the water surface will only decrease the abundance. Very important to remove all root fragments and cut plant parts. Any disturbance to the root system, that is not removed, will cause increased reproduction.

Interesting Facts: Competes with native aquatic vegetation and reduces habitat for wildlife.

Distribution Map

Cheatgrass/Downy Brome *(Bromus tectorum)*

Annual or winter grass, up to 40 cm (2 feet) tall. Flowers in early spring, dries by mid-summer. First introduced from the Mediterranean region in the late 1800s and is now the most common plant in the intermountain west.

Chris Evans, Invasive.org. Inset: Dr. Shawn Askew, Virginia Tech

NATIVE "LOOK-ALIKE" SPECIES

Fringed brome, *Bromus ciliatus*, is an uncommon perennial grass, distinguishable from cheatgrass because it grows in tussocks and has shorter, three to five mm awns.

Dave Powell, Invasive.org

Bromus ciliatus

QUICK ID

- Droopy seed heads
- Seed heads purplish at maturity
- Plant covered with soft white hairs
- Seed heads cling to socks, fur, and clothing

Biopix.dk

WSSA (Weed Science Society of America)

Steve Hurst

Flowers: Slender, branched flowering structures usually drooping to one side, with 8 to 18 mm long awns (stiff bristles) emerging from tip of each flower spikelet.

Leaves and Stems: Flat leaf blades, densely covered with soft white hairs; closed at the base; leaf sheath encases stem. A papery thin ligule, 1 to 3 mm long, with a ragged edge located at leaf base. Leaf sheaths lack auricles.

Seeds: Light brown, elliptical seeds with a red tinge. Stiff bristled awn emerges from seed tip. Single-seeded fruits, five to ten in each flower spikelet. Quick to mature and seeds may remain dormant for several years.

Roots: Fibrous roots may reach depth of 30 cm. Roots also develop during winter, allowing them to utilize higher levels of water and nutrients than other grasses.

Reproduction and Dispersal: By seed. Dispersed by animals, wind, water, soil movement, and by clinging to fur, clothing, and shoes.

Habitat Preferences: Roadsides, pastures (particularly dominant in overgrazed areas), meadows, and in cultivated or disturbed areas. Early colonizer in severe burns.

Manual Treatment: Hand pull entire plant, preferably in March, April, or early May, before seeds have formed. Begin on south and east-facing slopes. Frequent mowing (every three weeks) prior to seed set can reduce seed production.

Interesting Facts: Competes with more desirable native grasses for moisture because of ability to grow in winter and early spring.

Distribution Map

Yellow Flag Iris *(Iris pseudacorus)*

Erect perennial up to 1.2 meters (4 feet) tall and found in wet areas. Native of Europe and Africa. Introduced as an ornamental in the early 1900s.

MT SNWAEC. Inset: Ben Legler

NATIVE "LOOK-ALIKE" SPECIES

Yellow flag iris is easy to identify in flower. When not in bloom, it could be confused with native irises, such as the smaller Western blueflag, *Iris missouriensis*, a 30 to 60 cm tall native perennial with blue-violet flowers.

Al Schneider

Iris missouriensis

QUICK ID

- Showy yellow flowers
- Long, sword-like leaves
- Only completely yellow-flowered Iris in North America
- Forms dense colonies in wet areas

Ben Legler

Flowers: One to several large, yellow flowers on each stem; has three upward pointing petals and three downward pointing, tongue-shaped sepals; often adorned with brown spots or purple veins.

Clayton J. Antieau

Leaves and Stems: Leaves are .5 to 1 meter long, sword-like, flat, with pointy tip; 8 to 25 mm wide; raised midribs and smooth edges; arranged with sheathing, fan-like. Branched, flowering stems have few to no leaves.

Seeds: Fruit is an erect, three-chambered, glossy-green cylindrical capsule. Each chamber contains many disc-shaped, pitted, pale brown seeds densely packed in vertical rows.

Steve Hurst

Roots: Thick, fleshy rhizomes may extend 10 to 20 cm (4 - 8 inches) deep. Rhizomes often form horizontal mats, and can grow for several months without water.

Reproduction and Dispersal: By rhizomes and seeds. Seeds germinate and grow well after being burnt.

Habitat Preferences: Found in moist soils near lakes and ponds, streambanks, irrigation ditches and wetlands.

Manual Treatment: Hand-pulling or digging can successfully control small, isolated patches if the entire rhizome mass is removed and treatment is repeated every year for several years to weaken and eventually kill the plant. Wear gloves.

Interesting Facts: Has been used for erosion control, sewage treatment, and is known to remove metals from wastewater. Can be toxic to humans and animals. Yellow flag iris continues to be sold through garden dealers.

Distribution Map

Purple Loosestrife *(Lythrum salicaria/virgatum)*

Perennial species that often forms solid stands in aquatic to semi-aquatic sites. One plant can produce many stout, 1 to 3 meters (6 -10 feet) tall, branched stems. Introduced as an ornamental from Europe in the early 1800s.

Biopix.dk. Inset: Gary Fewless

NATIVE "LOOK-ALIKE" SPECIES

Fireweed, *Chamerion angustifolium/ Epilobium angustifolium,* also has pink flowers in long, dense clusters at the top of the plant, but has a four-lobed flower and alternate stem leaves.

Louis-M. Landry

Chamerion angustifolium

QUICK ID

- Pink-purple flowers in long, dense clusters
- Leaves opposite
- Square stem
- Found in moist habitats

Louis-M. Landry

Flowers: Flowers in long, dense, vertical clusters (or terminal racemes) with leaves. Showy flowers with 4 to 8 wrinkled petals. Sepals have 8, 10 or 12 prominent green veins.

Leaves and Stems: Opposite leaves without stalks, sometimes in spirals (or whorls) around the stem. Lance-shaped, slightly hairy with smooth edges. Stiff, square or octagonal stem. Can be smooth or with soft hairs.

Steven J. Baskauf

Seeds: Numerous brown to black seeds in a small, brown, two-chambered capsule. Can produce over two million seeds annually. Viable for up to 20 years.

Roots: Woody taproot and extensive branching fibrous root system.

Reproduction and Dispersal: By seeds and underground horizontal roots (rhizomes). Detached root or stem fragments can also form new plants.

Dr. Shawn Askew, Virginia Tech

Habitat Preferences: Near shorelines in wetlands, floodplains, ponds, streams, rivers, lakes, ditches, canals and other disturbed wet soil areas. Well-established plants can persist on dry sites for many years. Can tolerate a wide range of growing conditions.

Manual Treatment: Hand pull young plants, removing all roots and underground stems. **Report immediately if found.**

Interesting Facts: Invades wetland areas and can expand quickly due to abundant seed production. Astringent herb used for treatment of diarrhea and dysentery.

Distribution Map

St. Johnswort *(Hypericum perforatum)*

Erect, perennial herb up to 1 meter (3 feet) tall. The whole plant turns a rusty red color at maturity. Introduced from Eurasia.

Ben Legler. Inset: Michael Lemmer, www.naturkamera.de

NATIVE "LOOK-ALIKE" SPECIES

A native species of St. Johnswort, *Hypericum scouleri*, is found at higher elevations and is generally a smaller plant (10 to 19 cm tall).

Keir Morse

Hypericum scouleri

QUICK ID

- Yellow flowers with black dots at petal edge
- Leaves with tiny transparent dots
- Rust colored stems
- Seed pods and dead stalks are rusty

Ben Legler

Ben Legler

Norman E. Rees, Invasive.org

Flowers: Bright yellow, clustered at the top of branches. Less than 2.5 cm in diameter. Five petals with glands along their margins. Petals are 8 to 12 mm long.

Leaves and Stems: Stems are rust-colored, have black glands and two ridges running lengthwise. Oval-shaped leaves are less than 2.5 cm long, hairless, and have prominent veins. Leaf margins are smooth and rolled under.

Seeds: Rust-colored seed pods are sticky. Numerous seeds are contained in each pointed, three-chambered seedpod. Seeds are nearly cylindrical and have a rough texture. Viable for up to 10 years.

Roots: Deep, stout taproot, up to 1.5 meters (5 feet) deep with many branched lateral roots or rhizomes (creeping underground runners) with vegetative buds that form new shoots.

Reproduction and Dispersal: Reproduces by seed and creeping rhizomes. Root fragments can also develop into new plants. Seeds have a gelatinous seed coat that sticks to animals.

Habitat Preferences: Found in disturbed areas, roadsides, pastures, meadows, forest openings and burned areas at low to mid-elevations. Does not tolerate water saturated soils.

Manual Treatment: Hand pulling or digging young plants before seed production is effective. Remove as much of the taproot and rhizomes as possible. If buds, flowers, or seedheads have formed, pick, bag, and remove.

Interesting Facts: St. Johnswort has become popular as an herbal remedy, mainly for the treatment of depression, as well as for burns and skin disorders.

Distribution Map

Field Bindweed *(Convolvulus arvensis)*

Perennial vine up to 3 meters (10 feet) long. Grows horizontally along the ground or climbs. Native to Eurasia.

Michael Lemmer, www.naturkamera.de. Inset: Ben Legler

"LOOK-ALIKE" SPECIES

Wild buckwheat, *Polygonum convolvulus*, is a **non-native** with inconspicuous greenish-pink flowers, heart-shaped sharp leaves, and a small papery sheath that encircles the stem at the leaf base.

Louis-M. Landry

Polygonum convolvulus

QUICK ID

- Two small, scale-like bracts below the base of flower
- Twining vine-like stems
- White to pink funnel-shaped flowers
- Arrowhead-shaped leaves

Ben Legler

Flowers: White to pinkish, funnel shaped flowers; 2.5 cm diameter. Two small bracts are attached to the long flower stalk below the flower's base. Flowers close when it is dark, overcast, or raining. They last a single day.

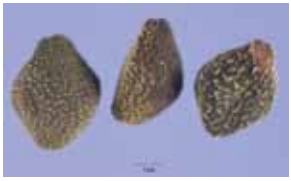
Leaves and Stems: Vine-like stems twine around supports, fences, and other plants. Dark green, arrowhead shaped leaves; alternately arranged and attached by 2.5 cm-long leaf stalks.

Dr. Shawn Askew, Virginia Tech

Seeds: Four seeds produced in a small, round fruit capsule. Seeds are dark gray to reddish-brown and three sided. Seeds are viable for over 60 years.

Roots: Extensive system of deep creeping roots and rhizomes. Roots are whitish, cord-like, fleshy and brittle. Can be 6 meters (20 feet) deep.

Reproduction and Dispersal: By seeds and creeping roots. Produces up to 500 seeds per plant. Seeds generally fall near parent plant but are also dispersed by soil movement, water, animals, human activity and as a contaminant in crop seed.



Steve Hurst

Habitat Preferences: Disturbed areas, pastures, cultivated fields, roadsides and occasionally found in riparian areas. Highly adaptive; grows best on moist, fertile soils.

Manual Treatment: Frequent hand-pulling of seedlings can be effective. Cutting and mowing have little effect unless plants are cut below the root crown at an early stage.

Interesting Facts: Will host viruses affecting crops such as potatoes and tomatoes. May be present in bags of bird seed.

Distribution Map

Dyer's Woad *(Isatis tinctoria)*

Erect annual, biennial, or short-lived perennial up to 1 meter (3 feet) tall. Introduced from Eurasia.

Louis-M. Landry. Inset: Michael Lemmer, www.naturkamera.de

NATIVE "LOOK-ALIKE" SPECIES

Dyer's woad is distinguishable from other species in the mustard family, such as the native Slender draba (*Draba albertina*), by its unique fruits.

Mary Ellen Harte, Invasive.org

Draba albertina

QUICK ID

- Bright yellow, four-petaled flowers
- Teardrop shaped seedpods
- Leaves have prominent white midrib
- Alternate, hairless stem leaves

Biopix.dk

Joseph M. DiTomaso, UC Davis

Joseph M. DiTomaso, UC Davis

Flowers: Bright yellow flowers, each 3 mm across, in a dense flat-topped cluster at the upper portion of the stem. Four petals are arranged in a cross formation.

Leaves and Stems: A rosette forms the first year, and a flowering stem emerges in the second year. Leaves have a white midrib and a powdery white film. Rosette leaves have soft hairs, slightly wavy margins, and long stalks. Stem leaves are alternate, hairless, and lance shaped. Stems are woody; many branched in the upper portion.

Seeds: Purplish-brown, teardrop-shaped seedpods hanging from one-seeded stalks. Can produce 10,000 seeds a year.

Roots: Thick taproot up to 1.5 meters deep and some lateral roots in the upper 30 cm of soil.

Reproduction and Dispersal: By seed. Most fruits fall near parent plant but some disperse short distances with wind and greater distances with water, soil movement, human activities, and as a contaminant in seed and hay.

Habitat Preferences: Disturbed or undisturbed areas, croplands, waterways, roadsides, grasslands, and open forests. Prefers full sun, dry, rocky, or sandy soils. Often found on south-facing canyon slopes.

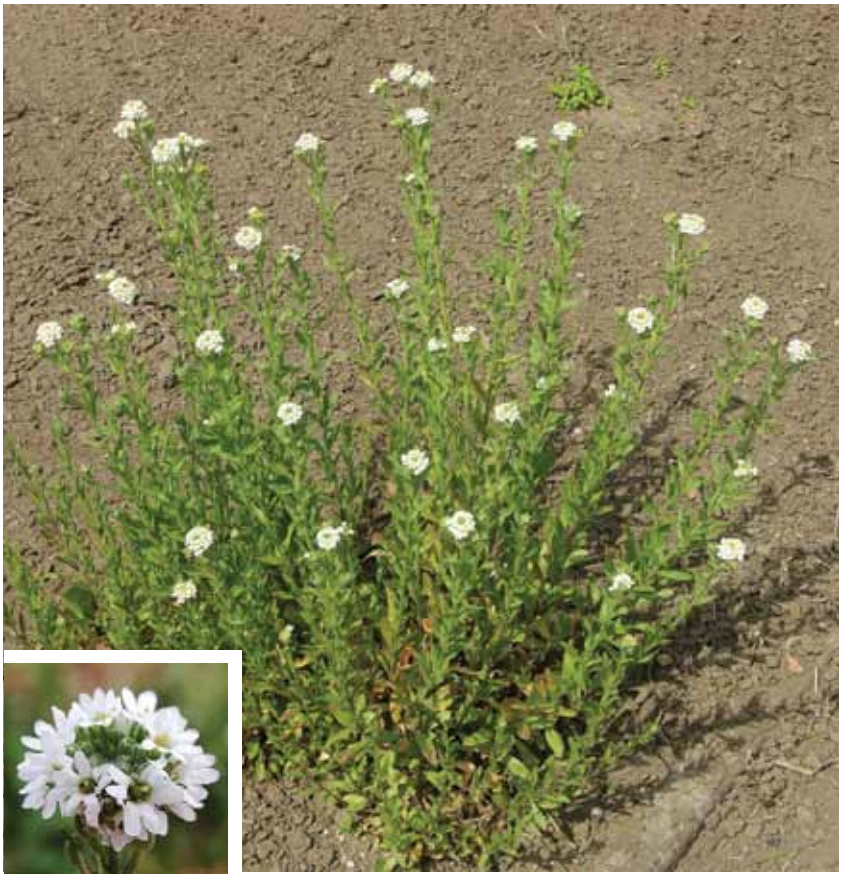
Manual Treatment: Hand pulling can be effective if entire crown is removed after the flowering stems have emerged but before seed set. Follow up for several years to prevent infestation. **Report immediately.**

Interesting Facts: Cultivated as a source of blue dye by early U.S. settlers prior to the trade of indigo from Asia.

Distribution Map

Hoary Alyssum *(Berteroa incana)*

Typically a biennial (rarely perennial). Stiff, 0.3 to 1.1 meter (10 - 28 inches) tall weed, usually with branches near the top. Introduced from Eurasia.



Biopix.dk. Inset: Gary Fewless

NATIVE "LOOK-ALIKE" SPECIES

Field chickweed, *Cerastium arvense*, is a native perennial found in subalpine meadows and rocky hillsides. It has opposite, slender, stemless leaves and white flowers with five, deeply lobed petals.

Louis-M. Landry

Cerastium arvense

QUICK ID

- Entire plant covered with grayish, star-shaped hairs
- Oval seedpods close to stem
- White flowers have deeply notched petals
- Upper leaves clasp stem

www.floracyberia.net

Flowers: White (to yellow) flowers with four deeply notched petals on slender stalks in a deeply rounded cluster. Green sepals underneath flower petals are hairy and drop off soon after flowering.

Leaves and Stems: Gray leaves with star-shaped hairs. Leaves at base of plant are 3 to 5 cm long with slender stalks. Stem leaves lack stalks toward top of plant, point upward, and are pressed close to the stem. Multiple stems from the base that are covered with leaves and star-shaped hairs.

Gary Fewless

Seeds: Flattened oval seedpods, 5 to 8 mm long, with star-like hairs. Held close to the stem. Prominent point on the tip (remaining flower style). Chambered, with each chamber containing 3 to 7 seeds aligned in rows within.

Roots: Slender taproot.

Reproduction and Dispersal: By seed and as a contaminant in commerical seed or hay.

Habitat Preferences: Meadows, pastures, roadsides, embankments, or other disturbed habitat.

Manual Treatment: Hand pull or hoe entire plant. Mowing prevents seed production.

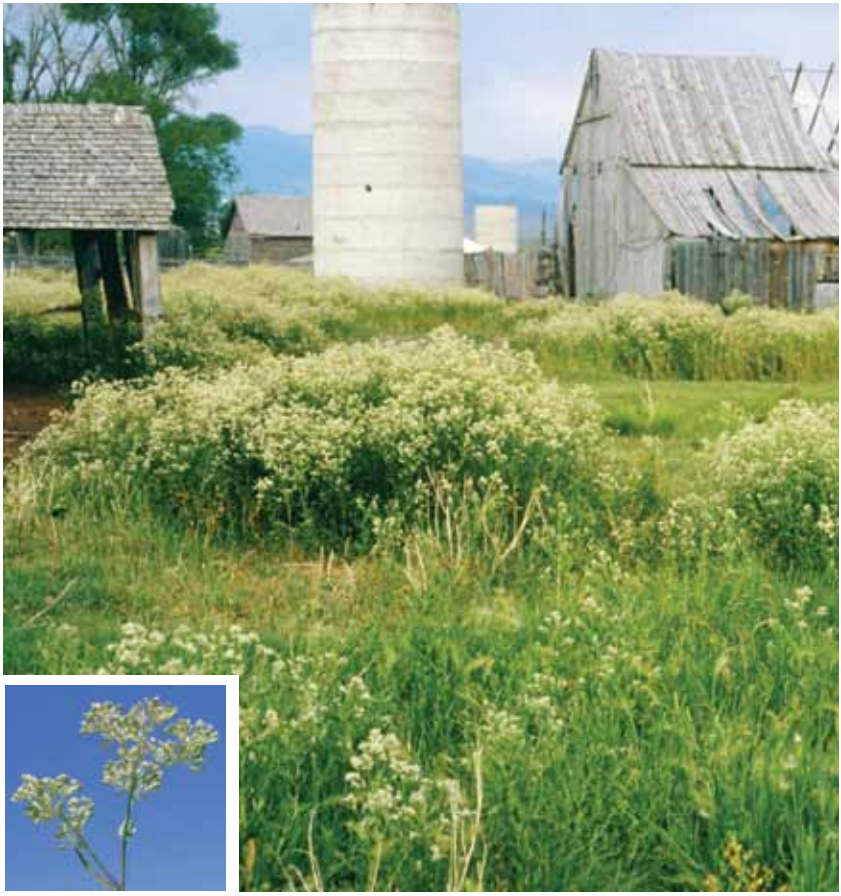
Interesting Facts: Toxic to horses, especially after it is dried in hay.

Gary Fewless

Distribution Map

Perennial Pepperweed *(Lepidium latifolium)*

Erect, perennial herb up to 2 meters (6 feet) tall. Grows in dense patches or clumps due to a creeping (rhizomatous) root system. Introduced from Eurasia.



Steve Dewey, Invasive.org. Inset: Richard Old, www.xidservices.com

NATIVE "LOOK-ALIKE" SPECIES

Common pepperweed, *Lepidium densiflorum*, is a native annual that reproduces only by seed. Distinguishable from Perennial pepperweed by hairless pods, green flower petals, deeply lobed leaves, and a taproot rather than creeping roots.

Ben Legler

Lepidium densiflorum

QUICK ID

- Waxy leaves with whitish mid-veins
- Grows in dense patches
- Dense white flower heads in rounded clusters near branch ends
- Seedpods attached by long stalks

Steve Dewey, Invasive.org

Flowers: Fragrant, white flower heads form dense, rounded clusters near the ends of branches. Flowers have four petals arranged in a cross.

Leaves and Stems: Leaves are waxy and have smooth or toothed margins and distinctive whitish mid-veins. Stem leaves are alternately arranged and tapered. Each stem has multiple branches. Dead stems persist for several years.

Joseph M. DiTomaso, UC Davis

Seeds: Tiny seedpods are slightly hairy. Seedpod stalks are longer than the seedpods.

Roots: Rhizomatous with a creeping root system. Buds on roots develop into new shoots. Often reaching depths of 1.8 meters or more.

Steve Dewey, Invasive.org

Reproduction and Dispersal: Primarily by rhizomes and root fragments, but also by seed. Roots can remain dormant for several years. Seeds are spread by wind, water, machinery, soil movement, and as a contaminant in hay and crop seed.

Habitat Preferences: Meadows, fields, roadsides, ditches, waterways, floodplains, seasonally wet areas, cultivated lands and rangelands. Thrives in moist habitats.

Manual Treatment: Cutting or mowing 2 to 3 times per year at bud stage for several years slows spread and decreases vitality, but will not control infestations. Successful hand pulling or digging requires complete removal within ten days after weed emergence.

Interesting Facts: Above-ground parts are high in vitamin C. Seeds may be used like pepper. Roots can be grated and made into a sauce similar to horseradish.

Distribution Map

Whitetop/Hoary Cress *(Cardaria draba)*

Erect, perennial herb up to 0.6 meters (2 feet) tall. Has a flat-topped appearance. Introduced from Eurasia most likely in contaminated alfalfa seed. Also known as *Lepidium draba*.

MT SNWAEC. Inset: Michael Lemmer, www.naturkamera.de

NATIVE "LOOK-ALIKE" SPECIES

Common yarrow, *Achillea millefolium*, has a similar white, flat-topped flower cluster. The leaves are easily distinguished as they are very finely pinnately divided, appearing feather-like, and have a fragrant aroma when crushed.

Louis-M. Landry

Achillea millefolium

QUICK ID

- Dense, white flower heads
- Upper leaves clasp stem
- Inflated, upside down, heart-shaped seedpods
- Grows in dense patches

Biopix.dk

Flowers: Small, fragrant, white flowers are in dense clusters at the top of plant. Individual flowers have a slender, 1.3 cm stalk.

Leaves and Stems: Leaves on mature plant are shaped like arrowheads, alternately arranged, and have finely toothed edges. Basal rosette has bluish-green, lance-shaped leaves. A single stem, often branched near the top, has one flower cluster.

Joseph M. DiTomaso, UC Davis

Seeds: Inflated seedpods are shaped like an upside down heart. Seedpods contain two reddish brown, egg-shaped seeds separated by a narrow partition. Viable up to three years.

Roots: Rhizomatous, with vigorous creeping root system. Below ground buds develop new shoots. Root system comprises over 75% of the plant's total biomass; can grow up to 9 meters (30 feet).

J. O'Brien, UC Davis

Reproduction and Dispersal: Primarily by rhizomes and root fragments; can form dense patches of clones over an area of 3.6 meters (12 feet). Also reproduces by seed. Can produce two crops of seeds per year.

Habitat Preferences: Meadows, fields, roadsides, ditches, waterways, cultivated lands and rangelands. Particularly adapted to subirrigated pastures with alkaline soils.

Manual Treatment: Cutting or mowing two or three times per year at bud stage for several years slows spread and may decrease vitality of plants, but will not control infestations. Cultivation or hoeing 1 to 2 times per month over 2 to 4 years may eliminate colonies.

Interesting Facts: Above-ground parts are high in vitamin C.

Distribution Map

Baby's Breath *(Gypsophila paniculata)*

Erect, bushy perennial up to 1 meter (3 feet) tall. Introduced from Eurasia as an ornamental. Now grown as a crop and used extensively in floral arrangements.

Amelie Rousseau. Inset: Joseph M. DiTomaso, UC Davis

NATIVE "LOOK-ALIKE" SPECIES

Pearly everlasting, *Anaphalis margaritacea*, appears similar but the main distinguishable difference is that Pearly everlasting has soft-hairy foliage, alternate leaves, and is not bushy or heavily branched.

Richard Old, www.xidservices.com

Anaphalis margaritacea

QUICK ID

- Small, white, sweet-scented flowers
- Flower tops look like wispy clouds
- Bluish-green stems and branches; overall bushy appearance
- Opposite linear leaves with a prominent white mid-vein

Richard Old, www.xidservices.com

Joseph M. DiTomaso, UC Davis

Steve Dewey, Invasive.org

Flowers: Numerous, small, white (occasionally pink) flowers at stem's end – heavily branched clusters. Five petaled flowers, 1.5 to 3 mm wide. A fused, cuplike group of sepals below the flower petals has 5 teeth.

Leaves and Stems: Many-branched, slender stems are swollen at the nodes. Leaves are linear, opposite, hairless, and covered with a powdery white film, which produces a bluish look. Prominent white mid-veins are generally 1.8 to 10 cm, but size decreases towards top. Very few leaves are present when flowers have bloomed.

Seeds: The fruit is a small, egg-shaped capsule with four compartments, each containing 2 to 5 black, kidney-shaped seeds. Can produce over 13,000 seeds per plant.

Roots: Up to 3.6 meters deep, thick, woody tap root has sufficient reserves to survive two years of adverse growing conditions.

Reproduction and Dispersal: By seeds only. Most seeds fall near the parent plant, but mature plants often break off at ground level and wind tumble, dispersing seeds much further.

Habitat Preferences: Disturbed areas, grasslands, pastures, roadsides. Prefers sandy and slightly alkaline soils.

Manual Treatment: Severing the crown from the roots by cultivation or hand-cutting below the soil surface usually kills Baby's breath. Regrowth is rare if the complete crown is removed.

Interesting Facts: Can outcompete healthy perennial grasses.

Distribution Map

Bladder Campion *(Silene vulgaris)*

Erect perennial up to 1 meter (3 feet) tall that often grows in clumps. Also known as *Silene cucubalus*. Introduced from Eurasia.

Ben Legler. Inset: Ben Legler

NATIVE "LOOK-ALIKE" SPECIES

Silene menziesii, an uncommon native plant found in open montane forests, aspen groves and along streams, can be distinguished from Bladder campion by its smaller size (5 to 30 cm tall), its typically trailing stems, and its sticky-hairy foliage.

Steve Matson

Silene menziesii

QUICK ID

- Fragrant white flowers clustered at branch tips
- Waxy, bladder-like calyx has veins
- Leaves opposite, hairless, and covered with a waxy white film
- Plant produces both male & female flowers

Ben Legler

Flowers: 5 to 30 white (or pinkish), five petaled flowers on stalks; deeply notched at tip. Sepals are fused into a tubular calyx-encasing flower with pinkish-purple veins.

Leaves and Stems: Foliage is hairless, pale green, and waxy with a white powdery film. Smooth waxy leaves are stalkless, lance-shaped or oblong, and pointed. Distinctive center crease and entire margins.

Michael Lemmer, www.naturkamera.de

Seeds: The fruit is an egg-shaped capsule. Numerous grey to brown seeds, covered with bumpy rows. Plants capable of producing over 20,000 seeds.

Roots: Initially forms a white taproot, then branches into numerous, deep, lateral, woody, branching roots, which act as rhizomes.

Joseph M. DiTomaso, UC Davis

Reproduction and Dispersal: By seed and by sprouting from lateral root branches. Root fragments can also reproduce. Reseeds close to the parent plant, but can travel by soil movement, water, animals, human activities, or as a contaminant in commercial seed or hay.

Habitat Preferences: Found in disturbed areas, roadsides, pastures and meadows at low to mid-elevations. Prefers full sun and medium to coarse, well-drained soils.

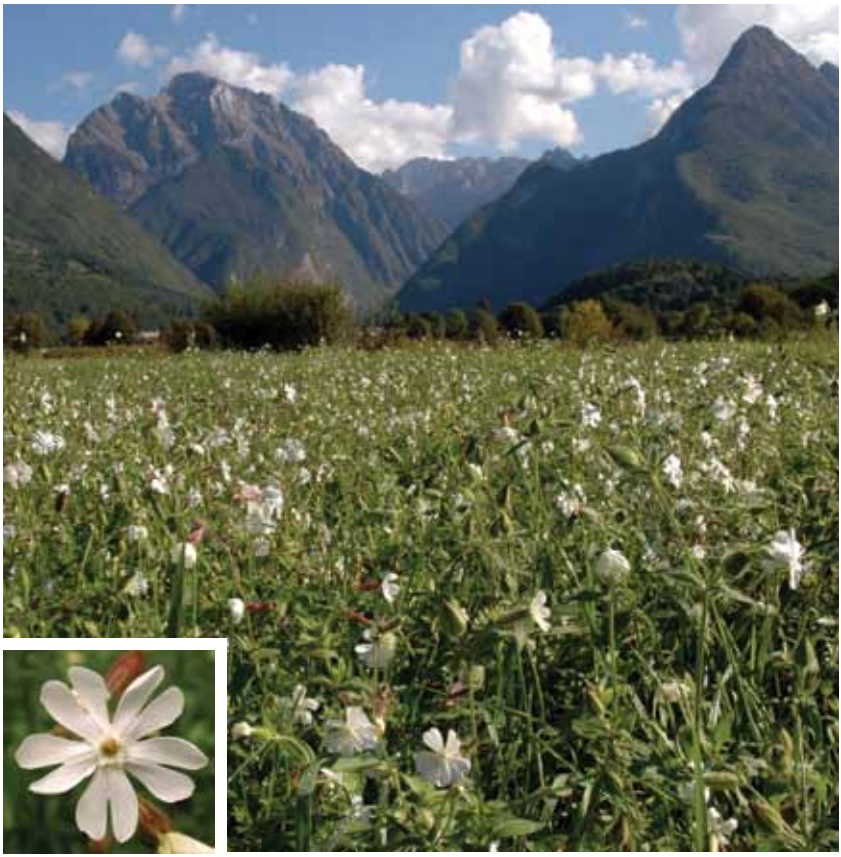
Manual Treatment: Hand pull before seed production. Remove as much of the root system as possible. Be careful not to transport root pieces that could start infestations elsewhere.

Interesting Facts: Young shoots and leaves are edible raw or cooked, but may be mildly

Distribution Map

White Campion/White Cockle *(Silene latifolia)*

Erect, short-lived perennial (occasionally biennial) herb up to 1 meter (3 feet) tall. Can be erect or spreading. Also known as *Lychnis alba* or *Silene alba*. Introduced from Eurasia.



Dr. Amadej Trnkoczy. Inset: Ben Legler

NATIVE "LOOK-ALIKE" SPECIES

Alpine lantern, *Silene uralensis*, is similar in overall appearance but is distinguished by its small size, 5 to 25 cm tall, and its petals that are usually contained within the calyx (not protruding). Found in subalpine to alpine areas.

Alfred Cook

Silene uralensis

QUICK ID

- Hairy pouch-like calyx with dark green or reddish purple veins
- Clusters of white flowers with five deeply notched petals
- Stems and leaves covered in hairs

Ben Legler

Dr. Amadej Trnkoczy

Michael Lemmer, www.naturkamera.de

Flowers: Two to three fragrant white or pink flowers, clustered at stem ends; attached by 5 mm stalks. Flowers are 2 cm wide; have five deeply notched petals; sticky/hairy tubular calyx surrounds the flower.

Leaves and Stems: Foliage is covered in short, bristly hairs. Many stems can arise from each root crown. Leaves have entire (untoothed) margins and are lance-shaped with pointed tips. Basal leaves are stalked; 2 to 10 cm long.

Seeds: Seeds are only produced by female flowers; they are covered with rows of warty bumps. The fruit is an egg-shaped capsule that opens by 10 teeth at the tip. Female plants capable of producing over 24,000 seeds.

Roots: Initially forms a taproot, up to 1.2 meters deep. Spreads into thick, fleshy lateral roots.

Reproduction and Dispersal: Primarily by seed. Stem and root fragments can also sprout to form new plants. Most seeds fall close to the parent plant but can transport longer distances by soil movement, water, animals, human activity, or as a contaminant in commercial seed or hay.

Habitat Preferences: Found in disturbed areas, roadsides, pastures, meadows and cultivated areas at low to mid-elevations. Prefers full sun and dry, rich, well-drained soils.

Manual Treatment: Hand pulling before seed production is often effective. Remove as much of the root system as possible. If flowers or seedheads have formed, pick, bag and remove.

Interesting Facts: Hairy leaves distinguish this plant from similar looking Bladder campion.

Distribution Map

Sulfur (Sulphur) Cinquefoil *(Potentilla recta)*

Erect, long-lived perennial 0.3 to 0.8 meters (1 - 3 feet) tall. Older plants often form a ring-shaped clump as old roots die in the center and new shoots grow on the outside edges. Native to Eurasia.

Dr. Shawn Askew, Virginia Tech. Inset: Michael Lemmer, www.naturkamera.de

NATIVE "LOOK-ALIKE" SPECIES

Many native cinquefoils, such as *Potentilla gracilis*, appear similar but Sulfur cinquefoil can be distinguished by long, right angled hairs; numerous stem leaves but few basal leaves; and leaves that appear green on the underside.

Ben Legler

Potentilla gracilis

QUICK ID

- Pale yellow flower with 5 petals
- Long, stiff hairs perpendicular to stem
- Relatively few leaves at plant base
- Underside of leaf is green, not silver
- Palmate leaves

Steven J. Baskauf

Joseph M. DiTomaso, UC Davis

Michael Lemmer, www.naturkamera.de

Flowers: Pale yellow flowers, 1.3 to 2.5 cm in diameter, five heart-shaped petals; bright yellow centers. Contain 25 to 30 stamens. Found on top of stems.

Leaves and Stems: A rosette of long-stalked leaves develops first and withers before flowering. Stems and leaves are covered with long, coarse, shiny hairs at right angles. Stem leaves are alternate, green on the underside, and composed of 5 to 7 leaflets with toothed margins. Leaflets appear like marjiuana leaves (palmately compound).

Seeds: Oval shaped dark brown seeds covered with net-like ridges.

Roots: Woody taproot may have several spreading roots but no rhizomes.

Reproduction and Dispersal: By seed only. Most seeds fall near parent plant and disperse greater distances with water, soil movement, human activities, and animals. Seeds survive three years or longer.

Habitat Preferences: Disturbed areas, grasslands, open forests, shrubby areas, roadsides, fields. Can invade healthy plant communities but does not tolerate full shade. Associated with knapweed infestations.

Manual Treatment: Hand digging (not pulling) may eradicate small infestations if root crowns are completely removed and treatment is repeated for several years. Mowing is not an effective control method.

Interesting Facts: Unpalatable to grazing animals due to high tannin content.

Distribution Map

Leafy Spurge *(Euphorbia esula)*

Erect, long-lived perennial up to 1 meter (3 feet) tall.

Anne Elliott. Inset: Ben Legler

NATIVE "LOOK-ALIKE" SPECIES

Western stoneseed, *Lithospermum ruderale* (also known as Lemonweed or Yellow puccoon), is distinguishable by stiff-hairy foliage with smaller lower leaves. Light yellow flowers have five spreading lobes.

Werner Eigelsreiter

Lithospermum ruderale

QUICK ID

- Heart-shaped floral leaves
- Greenish-yellow flower clusters
- Exudes milky juice when cut or broken
- Numerous pink buds on roots at stem base

Drake Barton, MT SNWAEC

Anne Elliott

Steve Dewey, Invasive.org

Flowers: Greenish-yellow flowers on long stalks cluster in flat-topped umbrellas. Flowers lack petals and sepals, relatively inconspicuous. Pairs of heart shaped floral leaves underneath flower clusters.

Leaves and Stems: Pale, bluish green foliage exudes a milky sap when cut. Thickly clustered, smooth, hairless stems, branched near the top. Leaves, 2.5 to 10 cm long and 6 mm wide, numerous and usually drooping, attached directly to stem in an alternate or spiral arrangement.

Seeds: Oblong, with three-celled capsule. Capsules forcibly burst open when ripe, propelling seeds up to 4.5 meters (15 feet) and aiding in dispersal. Viable up to 8 years.

Roots: Vigorous, creeping root system with pink scaly buds which develop into new shoots. Can reach depth of 7.6 meters (25 feet) and extend 4.5 meters (15 feet) annually.

Reproduction and Dispersal: Initially by seed then reproduces by re-sprouting from its extensive, creeping root system. Can also re-sprout from root fragments.

Habitat Preferences: Tolerates a wide range of soil types, soil moisture levels and habitats. High genetic diversity resulting in quick adaptation to local growing conditions.

Manual Treatment: Hand-pulling, digging or mowing are generally ineffective other than on very small infestations in their first year of growth. Wear gloves and wash after handling as milky sap can irritate skin.

Interesting Facts: Dead plants appear to inhibit the growth of other plants. Large quantities

Distribution Map

Tamarisk/Saltcedar *(Tamarix chinensis/ramosissima)*

Perennial shrub or small tree 1.5 to 6 meters (5 - 20 feet) tall. Can be deciduous or evergreen. T*amarix chinensis* and *Tamarix ramosissima* extensively hybridize.

Steve Dewey, Invasive.org. Inset: Richard Old, www.xidservices.com

"LOOK-ALIKE" SPECIES

Smallflower tamarisk, *Tamarisk parviflora*, is a similar **non-native** species with four-parted flowers and nectar disk lobes that are longer than wide and together with stamens.

Richard Old, www.xidservices.com

Tamarisk parviflora

QUICK ID

- Deciduous or evergreen shrub
- Small, scaly, cedar-like leaves
- Pinkish-purple to white flowers in finger-like clusters
- Highly branched reddish brown stems

Steven Perkins

Steve Dewey, Invasive.org

Jose Hernandez

Flowers: Small, pale pink to white flowers with five petals in unbranched, finger-like clusters on the ends of branches. Flowers have 5 sepals, 5 petals and 5 stamens; lobed nectar disk at the base.

Leaves and Stems: Stems highly branched, slender and smooth, with reddish brown bark; becomed furrowed with age. Small, scale-like, alternate, overlapping leaves. Foliage turns yellow to orange in fall.

Seeds: Numerous, tiny, cylindrical seeds. Seeds have a tuft of long hairs at the tip.

Roots: Extensive root system grows to five meters deep or more to access the water table. Once water table is reached, taproot branches profusely into lateral roots. Uses both surface and groundwater.

Reproduction and Dispersal: By seeds dispersed primarily with wind and water. Seeds are short-lived and can germinate within 24 hours. Can produce up to 500,000 seeds per plant. Also resprouts from root and stem fragments.

Habitat Preferences: All riparian areas. Uses large amounts of groundwater, often drying up waterways. Now the dominant riparian species in southwestern U.S.

Manual Treatment: Seedlings and small plants should be uprooted by hand before they become established. Remove plant parts to prevent resprouting of stems and shoots. **Report immediately.**

Interesting Facts: Stem and leaves secrete salt, making soils too saline for other vegetation to grow. Most animals do not consume

Distribution Map

Field Scabious *(Knautia arvensis)*

Erect perennial up to 1.5 meters (4 feet) tall. Introduced from Eurasia as an ornamental. Also known as Bluebuttons.

Rob Broekhuis, www.robsplants.com. Inset: Louis-M. Landry

NATIVE "LOOK-ALIKE" SPECIES

Flowers superficially resemble those of Wild chives, *Allium schoenoprasum*, which has tubular hollow leaves that smell like chives when crushed.

Louis-M. Landry

Allium schoenoprasum

QUICK ID

- Solitary violet flower heads
- Ring of narrow, green floral bracts
- Leaves deeply lobed into 5 to 15 narrow segments
- Lower part of plant is bristly/hairy

Michael Lemmer, www.naturkamera.de

Flowers: Violet blue to pale purple, up to 4 cm wide; solitary on the end of a long, leafless stalk. Below each flower head are 8 to 12 sepals and a ring of narrow green bracts. Florets have 4 to 5 lobed petal tubes, four stamens, and a single pistil.

Louis-M. Landry

Leaves and Stems: Low growing rosette in first year. Rosette leaves are coarsely toothed, stalked leaves 10 to 25 cm long. Produces one main stem the second year. Stem leaves are opposite, stalkless, and deeply lobed into 5 to 15 narrow segments.

Seeds: Rectangular, light brown, four-sided seeds that are densely covered with long hairs. Can produce 200,000 seeds and may remain viable in the soil for several years.

Carole Ritchie

Roots: Woody taproot, often with branches.

Reproduction and Dispersal: By seed. Most seeds fall close to parent plant but animals also facilitate seed dispersal in their manure.

Habitat Preferences: Roadsides, pastures and fields. Prefers nutrient-rich and moderately moist to dry loam soils, but also establishes in gravelly soils. Can invade undisturbed plant communities.

Manual Treatment: Hand-pulling is effective if entire plant is removed - must repeat for several years to exhaust seed bank. Cutting or mowing before flowering can reduce seed production. Cultivation effective if done before flowering.

Interesting Facts: Still sold as an ornamental and butterfly attractant.

Distribution Map

Eurasian Water Milfoil *(Myriophyllum spicatum)*

Submerged aquatic perennial with stems 3 meters (10 feet) long or longer. Native to Europe, Asia, and North Africa. Possibly introduced in ship ballast or escaped from an aquarium.

ISDA/EWM Control Project. Inset: ISDA/EWM Control Project

NATIVE "LOOK-ALIKE" SPECIES

Spiked watermilfoil, *Myriophyllum exalbescens*, is a closely related native variety. It has fewer than 12 pairs of leaf segments, somewhat stouter stems, dissected floral bracts, and flowering spikes that often remain underwater when flowering.

Merel Black

Myriophyllum exalbescens

QUICK ID

- Submerged aquatic perennial
- Overall "bottle brush" appearance
- Composed of 12 to 28 pairs of leaf segments
- Forms large floating mats

Clayton J. Antieau

Flowers: Length 5 to 20 cm. Reddish flowering spike, held erect above the water surface. Flowering spikes contain whorls of four, small, yellow, 4-petaled flowers. Bracts below the flowers are not dissected.

Leaves and Stems: Slender, hairless, branching stems. Bright green, feathery leaves, 3 cm long. Composed of 12 to 28 pairs of segments. Arranged in whorls of four (occasionally 3 to 6) at each node. Leaves rarely extend above water surface.

ISDA/EWM Control Project

Seeds: Length 2.3 to 3 mm. Contains four seeds in a hard, segmented fruit. Floral bracts are shorter than the fruits.

Roots: Rhizomatous with numerous roots at the base and along the length of the stem.

Reproduction and Dispersal: Primarily by rhizomes. Also by stem fragments, seeds, and buds. Often spread by transport of fragments from one water body to another, by boats, vehicles, and by water currents.

Clayton J. Antieau

Habitat Preferences: Still or slow moving water in ponds, streams, and irrigation ditches. Prefers water 0.5 to 3.5 meters (1.5 - 11.5 feet) deep. Thrives in areas of natural or man-made disturbance.

Manual Treatment: Complete removal in early summer is effective. Clean your boats, trailers, and livewells of all plant fragments before you leave the dock area.

Interesting Facts: Dense floating mats may impede water flow, prevent light penetration to native plants, and reduce oxygen levels in the water. Continues to be sold through aquarium supply dealers.

Distribution Map

Aster Family *(Asteraceae)*

Common Burdock *(Arctium spp.)*

- Globe-shaped pale purple flower clusters covered in hooked green bristles
- Light brown globe-shaped burs cling to clothing and animals
- Large, rhubarb-like basal leaves
- Hollow stems with leaves that are dull green above, grayish underneath
- Most likely to proliferate in disturbed areas

Joseph M. DiTomaso, UC Davis

Dr. Shawn Askew, Virginia Tech

Dr. Shawn Askew, Virginia Tech

Absinth Wormwood *(Artemisia absinthium)*

- Characteristic medicinal sage-like odor, extremely bitter to taste
- Small, nodding yellow flower heads
- Leaves divided 2 to 3 times into narrow segments
- Covered with fine grayish-silver hair
- Most likely to proliferate in disturbed areas

www.floracyberia.net

Louis-M. Landry

Louis-M. Landry

Bull Thistle *(Cirsium vulgaris)*

- Dark purple flowerheads 3.8 to 5 cm wide, with sharp, spiny bracts
- Prickly stems with spiny wings from leaves
- Leaves with short prickles on the upper surface and cottony hair below
- Thick woody taproot
- Most likely to proliferate in disturbed areas

Steven J. Baskauf

Dr. Amadej Trnkoczy

Joseph M. DiTomaso, UC Davis

Western Salsify *(Tragopogon dubius)*

- Yellow flower heads close by mid-afternoon and remain closed on cloudy days
- Leaves grass-like
- Exudes milky juice when broken
- Large globed-shaped seed head with parachute-like plumes on each seed
- Most likely to proliferate in disturbed areas

Steven J. Baskauf

Steven J. Baskauf

Clayton J. Antieau

Bellflower Family *(Campanulaceae)*

Creeping Bellflower *(Campanula rapunculoides)*

- 6 - 1.2 m tall with bell-shaped purple flowers
- Alternate leaves are hairy on the upper surface
- Creeping white roots
- Heart-shaped basal leaves with coarsely toothed margins are present during flowering
- Ornamental plant that can invade native plant communities

Biopix.dk

Richard Old, www.xidservices.com

Clayton J. Antieau

Carrot Family *(Apiaceae)*

Poison Hemlock *(Conium maculatum)*

- Fern-like leaves on stems 1.8 - 3 meters tall
- Delicate white flowers in an umbrella-like cluster
- Foliage has strong musty- smelling odor
- Hollow stems with distinct ridges, many branches and purple blotches
- Most likely to proliferate in disturbed areas
- **All plant parts are poisonous**

Joseph M. DiTomaso, UC Davis

Steven J. Baskauf

Dr. Shawn Askew, Virginia Tech

Figwort Family *(Scrophulariaceae)*

Common Mullein *(Verbascum thapsus)*

- Fuzzy light green leaves thickly covered with soft, felt-like hairs
- Single, stout, flowering stem up to 1.8 meters tall emerges in second year
- Yellow five-lobed flowers attached directly to stem in a dense compact spike
- Dead plants are woody and look like torches
- Most likely to proliferate in disturbed areas
- Often on gravelly, south-facing slopes where other species cannot establish

Biopix.dk

Dr. Shawn Askew, Virginia Tech

Steven J. Baskauf

Veronica/Common Gypsyweed *(Veronica officinalis var. officinalis)*

- Low, ground cover-like plant
- Opposite, hairy oval leaves with toothed margins
- Pale bluish-purple, nearly stalkless flowers in elongated cluster in upper leaf nodes
- Flowers with two stamens, and saucer-shaped fused petals with four distinct lobes
- Can proliferate in native plant communities and persist under native forest canopy

www.floracyberia.net

Ben Legler

Grass Family *(Poaceae)*

Crested Wheatgrass *(Agropyron cristatum)*

- Perennial grass that forms dense mats
- Dry leaves from previous years ring its base
- Flat, 2 to 5 mm wide leaves are hairy on upper surface
- Dense spike of flowers in two closely spaced vertical rows like teeth on a two-sided comb
- Fringed ligule and claw-like auricles
- Agronomic plant that can invade native plant communities

Jamie Fenneman

Anne Elliott

Joseph M. DiTomaso, UC Davis

Reed Canary Grass *(Phalaris arundinacea)*

- Robust, hairless, perennial grass, often in large clumps or mats
- Bluish-green stems 0.6 to 2 meters tall
- Straw colored to pinkish flowers in a cluster with short, erect branches
- Often found in 'weed free' forage
- Can proliferate in native plant communities with moist soils

The Nature Conservancy

Biopix.dk

Dr. Shawn Askew, Virginia Tech

Smooth Brome *(Bromus inermis)*

- Perennial grass often forming sod
- Flat, 5 to 10 mm wide, leaflets
- Green to pale brown or purplish nodding, branched flower clusters
- Leaf sheath closed, ligules turned back at the tips and auricles lacking
- Agronomic plant that can invade native plant communities

Louis-M. Landry

Joseph M. DiTomaso, UC Davis

Louis-M. Landry

Timothy *(Phleum pratense)*

- Extremely common hay grass
- Pale green, finger-like, cylindrical, flowering spikes 5 to 10 cm long
- Stems with bulbous bases
- Upper leaf sheath not inflated
- Agronomic plant that can invade native plant communities

Anne Elliott

Dr. Shawn Askew, Virginia Tech

Dr. Shawn Askew, Virginia Tech

Goosefoot Family *(Chenopodiaceae)*

Russian Thistle *(Salsola kali)*

- Rounded, bushy, annual plant is bristly at maturity
- Stems usually with red or purple stripes
- Leaves spine-tipped
- "Tumbleweed" mature plants blow across the landscape with the wind
- Currently not established in the CCE but a persistent problem in eastern Montana

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Madder Family *(Rubiaceae)*

Yellow Bedstraw *(Galium verum)*

- Yellow flowers densely clustered at ends of branches
- Four angled stems up to 25 cm tall with minute hairs
- Fruit a hairless, two-lobed, two seeded nutlet
- Linear leaves with inrolled margins, generally in whorls of six or more
- Can proliferate in native plant communities

www.floracyberia.net

Michael Lemmer, www.naturkamera.de

Dr. Amadej Trnkoczy

Mustard Family *(Brassicaceae)*

Dame's Rocket *(Hesperis matronalis)*

- Fragrant purple flowers with four petals arranged like a cross
- Hairy alternate leaves
- Fruit an erect cylindrical pod with some constriction between the seeds
- Ornamental plant that can invade native plant communities

Louis-M. Landry

Dr. Shawn Askew, Virginia Tech

Steven J. Baskauf

Nightshade Family *(Solanaceae)*

Black Henbane *(Hyoscyamus niger)*

- Short-stalked brownish-yellow flowers with a purple center and purple veins
- Prominent vase-shaped seed capsules attached to top side of stem
- Stems up to one meter tall; crowded with hairy, clasping leaves
- Foliage covered with long, sticky hairs and has strong foul odor
- Most likely to proliferate in disturbed areas
- **Poisonous to humans**

Biopix.dk

Joseph M. DiTomaso, UC Davis

Joseph M. DiTomaso, UC Davis

Bittersweet Nightshade *(Solanum dulcamara)*

- Bluish-purple star-shaped flowers with prominent yellow pollen sacs
- Clusters of egg-shaped berries turn from green to bright tomato red
- Long stems, up to 3 meters, trailing or climbing on other plants
- Leaves dark green to dark purplish with one or more lobes at base
- Most likely to proliferate in disturbed areas
- **All plant parts are toxic**

Dr. Amadej Trnkoczy

Dr. Amadej Trnkoczy

Louis-M. Landry

Oleaster Family *(Elaeagnaceae)*

Russian Olive Tree *(Elaeagnus angustifolia)*

- 3 to 7.6 meter tall tree; stems with stiff woody thorns
- Leaves silvery, especially on the lower surface
- Fruit resembles small tan or silvery olives
- Small yellow flowers in clusters
- Avoid planting - draws down water table in dry areas

Ben Legler

Ben Legler

Nature Conservancy Conservancy

Joseph M. DiTomaso, UC Davis

Pea Family *(Fabaceae)*

Scotch Broom *(Cytisus scoparius)*

- Bright, showy, yellow, pea-like flowers, sometimes with red markings in the middle
- Woody shrub with five-angled surfaces on the stems
- Flat seedpods have fine, white hairs on the margins
- Lower leaves with three oval leaflets
- Currently not established in the CCE but found in nearby areas

Michael Lemmer, www.naturkamera.de

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Rose Family *(Rosaceae)*

Silver Cinquefoil *(Potentilla argentea)*

- Yellow five-petaled flowers, 6 to 8 mm across, in open clusters
- Stems 2.5 to 51 cm tall with 5 to 10 alternate leaves
- Palmate leaves, 1 to 2 cm long, with 5 leaflets cut over halfway to mid-vein into 5 to 9 teeth
- Lower leaf surfaces densely grayish-wooly hairy, deep green above
- Can proliferate in native plant communities
- Tends to grow in dense colonies

Biopix.dk

Michael Lemmer, www.naturkamera.de

Louis-M. Landry

Spurge Family *(Euphorbiaceae)*

Cypress Spurge *(Euphorbia cyparissias)*

- Narrow, bristle-like, alternate, dark-green stem leaves drop from stems early in season
- Greenish-yellow flower clusters with heart-shaped floral leaves
- Exudes milky juice when broken
- Looks similar to Leafy spurge but has fewer, shorter leaves and more branching at the top
- Currently not established in the CCE but found in nearby areas

Dr. Amadej Trnkoczy

Dr. Shawn Askew, Virginia Tech

Glossary

adventitious roots – Horizontal spreading roots (rhizomes).

alternate – Situated singly at each node.

annual – Plant whose life cycle is completed in one growing season.

auricle – Ear-like appendages found in grasses at the junction of the blade and the sheath.

awns – Stiff bristles.

axil – Where leaves are attached to stems.

basal – Refers to the base of the plant.

biennial – Plant lives for two growing seasons, usually producing a basal rosette the first year and flower/fruit the second year.

bract – Small leaf-like structure surrounding the flower, usually below the petals.

calyx – Collective term for the sepals of a flower.

capsule – A dry, many-seeded fruit with multiple chambers.

compound umbels – Umbrella like clusters at the top of flowering stalks.

disk flowers – Small inner flowers, usually tube shaped, in the aster family.

fibrous roots – Root system with many fine, diffuse roots.

forb – A broad-leaved, non-woody plant that dies back after each growing season.

leaflet – A single segment of a compound leaf.

ligule – In grasses, a small flat projection from the top of the sheath.

midrib – Central vein or rib of a leaf.

node – A place where a leaf or branch is attached, a joint.

nutlet – Hard, small, one-seeded fruit.

opposite – Situated across from each other.

palmate – Leaves divided into 3 or more lobes or leaflets diverging from a common point.

pappus – Hairs or bristles that are attached to the seeds of the aster family.

perennial – Plants that live for more than two growing seasons, usually flowering and producing fruit each year.

pinnate – Leaflets or lobes developing from several different points on main leaf axis, feather-like.

pistil – The female organ of the flower, composed of one or more carpels, each composed of an ovary, stigma, and style.

raceme – An unbranched cluster of stalked flowers attached along a central stalk, blooming from the bottom up.

ray flower – Found in members of the aster family (Asteraceae). A strap-shaped flower that appears to be a single petal, but is actually a complete flower.

rhizomatous – Having rhizomes.

rhizome – An underground stem that can develop nodes or buds at the joints.

rosette – Cluster of leaves radiating out in a circle from the base of the plant.

sepal – Leaf-like structures that enclose a flower bud; they form outermost whorl at the base of an open flower. Typically green.

sheath – A tubular covering; in grasses the leaf sheath surrounds and encloses the stem.

spikelet – A small, spike-shaped or elongated inflorescence bearing unstalked flowers in the grass and sedge families.

stamen – Pollen-bearing male part of the flower.

stolon – A horizontally spreading, above-ground runner.

taproot – Primary descending root along a plant's vertical axis that is larger than the branching roots.

umbel – A flower cluster with flower stalks ascending from the same point at the tip of a stem or branch.

Appendix of Photographers

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Management Partners Contact List

*Crown Managers Partnership (CMP)
www.crownmanagers.org

*Crown of the Continent Ecosystem Education Consortium (COCEEC)
www.crownofthecontinent.org/coceec.htm

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*Alberta Invasive Plants Council
PO Box 869, Okotoks, AB T1S 0E2
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www.invasiveplants.ab.ca

*Alberta Parks Southwest Area
Invasive Plant Management
www.albertaparks.ca

*Alberta Sustainable Resource Development
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*City of Calgary
PO Box 2100, Calgary, AB T2P 2M5
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(780) 674-3331
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*County of Two Hills
4801 57 Ave., Two Hills, AB T0B 4K0
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www.thcounty.ab.ca

*County of Warner #5
PO Box 90, 202 County Rd., Warner, AB T0K 2L0
(403) 642-2255
www.countyofwarner5.ab.ca

*Mountain View County
PO Box 100, Didsbury, AB T0M 0W0
(403) 335-3311
www.mountainviewcounty.com

*Municipality of Crowsnest Pass
PO Box 118, Crowsnest Pass, AB T0K 0E0
(403) 563-8658
www.crowsnestpass.ab.ca

*Municipal District of Pincher Creek
PO Box 279, Pincher Creek, AB T0K 1W0
(403) 627-4151
www.mdpinchercreek.ab.ca

*Nature Conservancy of Canada
Alberta Region
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Calgary, Alberta T2G 5A5
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www.natureconservancy.ca

*Parks Canada

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PO Box 900, Banff, AB T1L 1K2
(403) 760-1329
banff.vrc@pc.gc.ca

Waterton Lakes National Park
Box 200, Waterton Park, AB T0K 2M0
(403) 859-5180
waterton.info@pc.gc.ca

*Thorhild County
801 1st, Thorhild, AB T0A 3J0
(780) 398-3741
wwww.thorhildcounty.com

*Town of Canmore
Parks Department
902 7th Ave, Canmore, AB T1W 3K1
(403) 678-1580
www.canmore.ca

*Woodlands County
PO Box 33, Fort Assiniboine, AB T0G 1A0
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www.woodlands.ab.ca

*Yellowhead County
Agricultural Services
2716 1st Ave, Edson, AB T7E 1N9
1-800-814-3935
www.yellowheadcounty.ab.ca

British Columbia

*East Kootenay Invasive Plant Council
1902 Theatre Rd., Cranbrook, BC V1C 7G1
1-888-55-EKIPC
www.ekipc.com

*Invasive Plant Council of British Columbia
104-107 N. Second Ave., Williams Lake, BC V2G 1Z5
(205) 392-1400
www.invasiveplantcouncilbc.ca

*Ministry of Natural Resource Operations
Kootenay Boundary
Environmental Stewardship Division
PO Box 2949, Invermere, BC V0A 1K0
(250) 342-4290
www.gov.bc.ca/nro

*Nature Conservancy of Canada, British Columbia Region
Canadian Rocky Mountains Program
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*Parks Canada

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(250) 347-9505

kootenay.info@pc.gc.ca

*Regional District of East Kootenay
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Montana

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*Confederated Salish & Kootenai Tribes
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(406) 275-2700 ext. 1251
www.cskt.org

*Flathead National Forest
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Kalispell MT 59901
(406) 758-5798
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Kalispell, MT 59901
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Southwestern Land Office
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*Montana Department of Transportation
Roadside Maintenance
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*Ravalli County Weed District
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