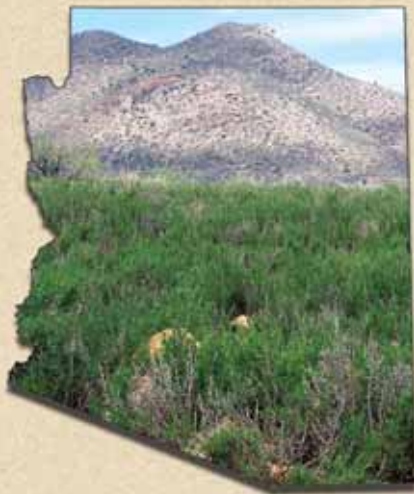


# **NON-NATIVE, INVASIVE PLANTS OF ARIZONA**



PRODUCED BY  
CONSERVATION DISTRICTS AND RC&D  
AREAS OF ARIZONA, AND THE UNIVERSITY  
OF ARIZONA COOPERATIVE EXTENSION

Peer Reviewed #AZ1482

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**This guide is dedicated to the  
memory of Carol Bailey  
1945-2008**

“It’s not how many hours you put in  
but how much you put into the hours.”

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COVER PHOTO: Sweet resin bush on Frye Mesa  
near Thatcher, AZ

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*Editor:*

- Larry D. Howery, Ph.D., Rangeland Specialist, School of Natural Resources, The University of Arizona, Cooperative Extension

*Authors:*

- Ed Northam, Ph.D., The University of Arizona, Cooperative Extension
- Walter Meyer, Ph.D., Range Science, The University of Arizona, Cooperative Extension

*Contributing Authors:*

- Jennifer Arnold-Musa, USDA-NRCS Rangeland Management Specialist
- Emilio Carrillo, USDA-NRCS Rangeland Management Specialist
- Kristen Egen, USDA-NRCS District Conservationist
- Mary Hershdorfer, USDA-NRCS Assistant Manager, Plant Materials Center

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- Patina Thompson, Coronado RC&D
- Laurie Abbott, New Mexico State University
- Jeff Schalaus, U of A Cooperative Extension in Prescott
- Patti Fenner, Noxious Weed Program Manager of the Tonto National Forest

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## Introduction

The noxious weed problem in the western United States has been described as “a biological forest fire racing beyond control because no one wants to be fire boss.” Indeed, when small weed infestations are left unchecked, they can grow exponentially and spread across the land much like a slow-moving biological wildfire. However, land consumed by fire usually recovers and is often more productive than before the fire occurred. On the other hand, land consumed by noxious weeds may be irreversibly changed and never again reach its full biological potential.

There are currently many small noxious weed infestations in Arizona that most people probably do not even recognize as a problem. However, the risk of ignoring these small infestations is great. Many weed scientists compare small infestations to biological time bombs, primed to explode when the right combination of environmental conditions come along. Indeed, over the past decade, many smaller infestations in Arizona have increased dramatically, expanding their range into previously uninfested areas (i.e., Sahara mustard, #7; yellow starthistle, #18). If we continue to allow this to happen, noxious weeds will cause widespread, irreparable economic and ecologic damage in Arizona just as they have in neighboring states (i.e., Utah, Colorado, California).

## History

This booklet is the 2<sup>nd</sup> edition of a similar booklet published in 2001. This edition includes most of the invasive plant species that appeared in the 1<sup>st</sup> edition and several other species have been added. The booklet is not intended to provide a comprehensive list of all of Arizona's invasive weeds, but rather, it illustrates a few invasive plants that have become, or have the potential to become, problematic in Arizona. The booklet was created to be large enough to contain pertinent, useful information, but small enough to fit in your pocket, backpack, or saddlebag. The booklet is arranged by plant life form (i.e., grasses, forbs, woody plants, and aquatic, riparian, or wetland plants). Common plant names are listed alphabetically under each life form with the exception of thistles, knapweeds and starthistles that are grouped to ease comparisons in identification. There is an Arizona Noxious Weed Reporting Form at the back of the booklet that is self-explanatory.

We give special thanks and acknowledgment to Dr. Richard Lee who created the original template for the first edition of this booklet. Dr. Lee's expertise was invaluable in the development and production of both editions.





## #1

### Buffelgrass

**Scientific Name:** *Pennisetum ciliare* (L.)

**Family:** Poaceae (Grass)

**Description:** Buffelgrass is a perennial warm-season bunch grass with rhizomes and sometimes stolons. It is a very robust grass that may grow over 3 feet tall and wide. Bristly flower heads range from 1½ to 5 inches long and can be purple, gray, or yellowish, turning a distinctive golden-brown color when dry. Spikes are crowded with dense bristly fruit which are actually burs without hardened spines. Although buffelgrass is a perennial, it is an extremely prolific seed producer. Inflorescences may emerge whenever soil moisture is available. New plants produce seed in as little as six weeks. Older plants branch profusely and densely at nodes, giving mature plants a “messy” appearance.

**Origin:** Africa, Asia, the Middle East.

**Distribution/Comments:** Buffelgrass is extremely drought tolerant and reestablishes and expands its range quickly after fire. Seeds are dispersed by wind, water, animals and vehicles. It is spreading in southern Arizona.



#2

## Cheatgrass (downy brome)

**Scientific Name:** *Bromus tectorum* (L.)

**Family:** Poaceae (Grass)

**Description:** Cheatgrass is a cool-season annual that can grow between 2 inches to 2 feet tall. Like most annuals, it is a prolific seed producer. It germinates during cooler temperatures and rapidly grows and sets seed before most other species. Seedlings are bright green with conspicuously hairy (downy) leaves, sheaths, glumes and lemmas. Seed heads are open, drooping, multiple-branched panicles with moderately awned spikelets. Auricles are absent. At maturity the foliage and seed heads often turn purplish before drying to brown or tan.

**Origin:** Eurasia.

**Distribution/Comments:** Cheatgrass is widely adapted and can be found from desert valley bottoms all the way to the tops of the highest mountain peaks (i.e., Mount Lemmon). It quickly invades heavily grazed rangeland, roadsides, waste places, burned areas, and disturbed sites. Cheatgrass can still flower and produce viable seed even when environmental conditions are poor and/or when grazing animals crop the plants. Spikelets readily attach to fur, clothing, and vehicles.



### #3

## Fountaingrass

**Scientific Name:** *Pennisetum setaceum*  
(Forsk. Chiov)

**Family:** Poaceae (Grass)

**Description:** This is a coarse, perennial, warm-season bunchgrass that grows 2 to 3<sup>1</sup>/<sub>2</sub> feet tall. Tufted culms grow in dense, usually large, clumps. Red, rosy to purple, bristly, spike inflorescences are 2 to 4 inches long, and <sup>3</sup>/<sub>4</sub>-1 inch wide. The <sup>1</sup>/<sub>4</sub> inch long spikelets are solitary or in clusters of 3 on white-hairy branches attached below the bristles. Flower heads are prominent, nodding, feathery, and attractive.

**Origin:** Africa, southwest Asia, the Middle East.

**Distribution/Comments:** Fountaingrass is found along roadways and is invading rangelands. Palatability of fountaingrass is low which facilitates competition with native plants. Like buffelgrass, fountaingrass rapidly reestablishes after burning and is prevalent in southern Arizona. The cultivar 'Cupreum' is reported to be sterile (does not set seeds.)



## #4

### Jointed goatgrass

**Scientific Name:** *Aegilops cylindrical* (Host)

**Family:** Poaceae (Grass)

**Description:** Jointed goatgrass is a winter annual reaching heights of 15 to 30 inches. It is closely related to, and can interbreed with, wheat. Its flowering portion is slender and segmented (jointed) and closely resembles wheat until spikes appear. Spikelets (joints) contain 1 to 3 viable seeds and disarticulate at maturity. Uppermost joints have distinctive awns. Plants produce 1 to many erect stems (tillers). Leaves have evenly spaced, fine hairs along the leaf edge and the sheath opening. Auricles are short and hairy. Ligules are short and membranous.

**Origin:** Eurasia.

**Distribution/Comments:** Jointed goatgrass is found primarily in the north central part of Arizona in both cultivated and uncultivated areas. It can impede wheat production.





#5

## Quackgrass

**Scientific Name:** *Elymus repens* (L. Gould)

**Family:** Poaceae (Grass)

**Description:** Quackgrass is a rhizomatous, perennial, cool-season grass that can grow up to 3½ feet tall. Seed heads are long, narrow spikes consisting of many individual spikelets arranged in 2 rows along the stem. Flowers consist of spikelets with 3 to 7 fertile lemmas. Stems are erect and hollow. Leaves are less than ½ inch wide and up to 12 inches long. Auricles clasp the stem. Its root system is a dense mass of fibrous roots and stout rhizomes.

Reproduction is by seeds and rhizomes.

**Origin:** Eurasia.

**Distribution/Comments:** Established Arizona populations are typically above 4000 feet in elevation occurring along roadsides, urban areas, streambanks and forest meadows. Mechanical treatment of quackgrass is not advised because it stimulates underground rhizomes which can produce new plants.



#6

## Red brome

**Scientific Name:** *Bromus rubens* (L.)

**Family:** Poaceae (Grass)

**Description:** Red brome is a cool-season annual grass that grows 8 to 20 inches tall with several to numerous stems from an erect to spreading base. Seed heads are reddish-purple as they ripen and form a dense, compact, and similar to a spike, panicle that is 2-3 inches long. As seed heads dry they turn tawny to brown. Leaf blades are short, narrow, flat and hairy, with prominent veins. Leaf sheaths are papery.

**Origin:** Eurasia, Mediterranean region.

**Distribution/Comments:** Red brome occurs on disturbed sites in various soil types, but is adapted to warmer temperatures than cheatgrass (see #2). During wet winters, cool-season annuals like red brome and cheatgrass increase fine fuel loads which intensify wildfire danger in warm and cold deserts.



#7

## **African (Sahara) mustard**

**Scientific Name:** *Brassica tournefortii* (Gouan.)

**Family:** Brassicaceae (Mustard)

**Description:** African (or Sahara) mustard is a cool-season annual forb with a strong herbaceous taproot. Growth begins as a rosette that may have a diameter of up to 3 feet during wet years. Height of mature plants rarely exceeds 4 feet. Plants develop a wide multi-branched inflorescence that can be 3 to 4 feet wide at maturity. Flowers are small and pale yellow. Adult plants produce thousands of seeds that become sticky when wet. Stems and leaves are hairy and bristly.

**Origin:** Mediterranean region, Middle East, North Africa.

**Distribution/Comments:** This plant infests roadsides, deserts, severely disturbed soil (rural and urban), abandoned cropland and hayfields primarily below 3500 feet. It flourishes during wet winters (e.g., 2005 in Arizona) and behaves as a tumbleweed when June and July winds blow plant skeletons across the landscape. This activity can greatly spread the seeds of this plant. Seeds can be sticky, hairy, and bristly, which also facilitates its spread by animals and vehicles.



#8

## African rue

**Scientific Name:** *Peganum harmala* (L.)

**Family:** Zygophyllaceae (Caltrop)

**Description:** African rue is a low-growing, aggressive, perennial forb that has a substantial woody root system. Its fruiting structure typically consists of 2-4 capsules with each cell containing many seeds. Flowers consist of 5 white petals. Each flower is borne singly in leaf axils along stems. Although technically a forb, it has a “bushy” growth habit with multiple branches. Stems and leaves are fleshy and, when crushed, have a bitter, acrid taste and a disagreeable odor. Because this plant is poisonous it should not be tasted. Leaves are alternate, smooth, and divided into linear segments. Height rarely exceeds 1 to 1½ feet.

**Origin:** North Africa.

**Distribution/Comments:** African rue was first reported in the United States near Deming, New Mexico in the 1920’s. Arizonans should look for African rue in the eastern part of the state.





#9

## Dalmatian toadflax

**Scientific Name:** *Linaria genistifolia* ssp. *dalmatica* (L.)

**Family:** Scrophularizceae (Figwort)

**Description:** Dalmatian toadflax is a creeping perennial forb with an extensive root system that grows up to 3 feet tall. Even though it is a prolific seed producer that can reproduce both by seed and vegetative reproduction, its deep-penetrating and horizontally spreading root system accounts for much of its spread once seedlings mature. Leaves are alternate, waxy, broad-based, and clasp the stem. Yellow flowers, similar to snapdragons, are borne in the axils of upper leaves. Flowers are striking with an orange bearded throat and a characteristic spur. It prefers dry sites at mid-to-high elevations.

**Origin:** Europe.

**Distribution/Comments:** Dalmatian toadflax was probably introduced as an ornamental because of its pretty yellow “snapdragon” flower but looks can be deceiving. It is extremely difficult to control once its creeping root system is established. It is very problematic in communities north of the Mogollon Rim (Flagstaff, Payson, Prescott).



## #10

### Field bindweed

**Scientific Name:** *Convolvulus arvensis* (L.)

**Family:** Convolvulaceae (Morning glory)

**Description:** Field bindweed is a drought tolerant, perennial creeping plant (vine) with climbing stems of 1 to 4 feet. Mature plants form dense tangled mats. Leaves are generally 1 to 2 inches long, are smooth, and are shaped like a spade or an arrowhead. Roots reach 20 feet below ground, and extensive lateral roots have buds that initiate new plants. Fruits are small, round capsules, each containing 4 seeds. Flowers are 1 to 1½ inches wide, trumpet-shaped, white or pink in color, typically with 2 small bracts located on the petiole. Flowers close each afternoon and reopen the following day.

**Origin:** Europe.

**Distribution/Comments:** Widespread throughout Arizona. It is difficult to eradicate because of its extensive and deep root system and because seeds can remain viable in the soil for up to 60 years.



## #11

### Hoary cress

**Scientific Name:** *Cardaria draba* (L. Desv.)

**Family:** Brassicaceae (Mustard)

**Description:** Hoary cress is a creeping perennial forb that grows up to 3 feet tall. Like dalmatian toadflax (#9), it reproduces by seed and an extensive, deeply penetrating root system. Leaves are elliptical, grayish-green, clasping, and lightly pubescent. Stems are erect and greatly branching near the flower. Flowers have four white petals, 1/4 inch across, borne on the top of the plant; hence one common name for this plant is “white top.” Heart-shaped seed pods have a slender, persistent beak in the upper cleft of seed pods. Two small, flat, reddish-brown seeds are contained in each of the heart-shaped seed pods.

**Origin:** Europe.

**Distribution/Comments:** Hoary cress distribution is limited to the north-central part of Arizona. It easily establishes in moist sites and is difficult to control once established. It has been introduced into urban settings as filler for dry flower arrangements.



#12

## Diffuse knapweed

**Scientific Name:** *Centaurea diffusa* (Lam.)

**Family:** Asteraceae (Sunflower)

**Description:** Diffuse knapweed can grow as an annual, biennial, or short-lived simple perennial forb with multiple branches. It ranges in height from 1 to 3 feet at maturity and can have white, rose, or purple flowers. Yellowish-green bracts are tipped with slender terminal spines that curve outward, are typically light brown with a margin like a comb. Bracts can also be “tipped” like spotted knapweed (#14). Basal leaves are finely divided while the stem leaves are entire and smaller than basal leaves.

**Origin:** Eurasia, the Mediterranean region, the Middle East.

**Distribution/Comments:** Also known as “tumble knapweed,” diffuse knapweed is a serious problem in Young and Flagstaff, Arizona. It is important to keep this plant in check because it has broad ecological amplitude, i.e., it can grow at low and high altitudes in a variety of ecological sites.





## #13

### Russian knapweed

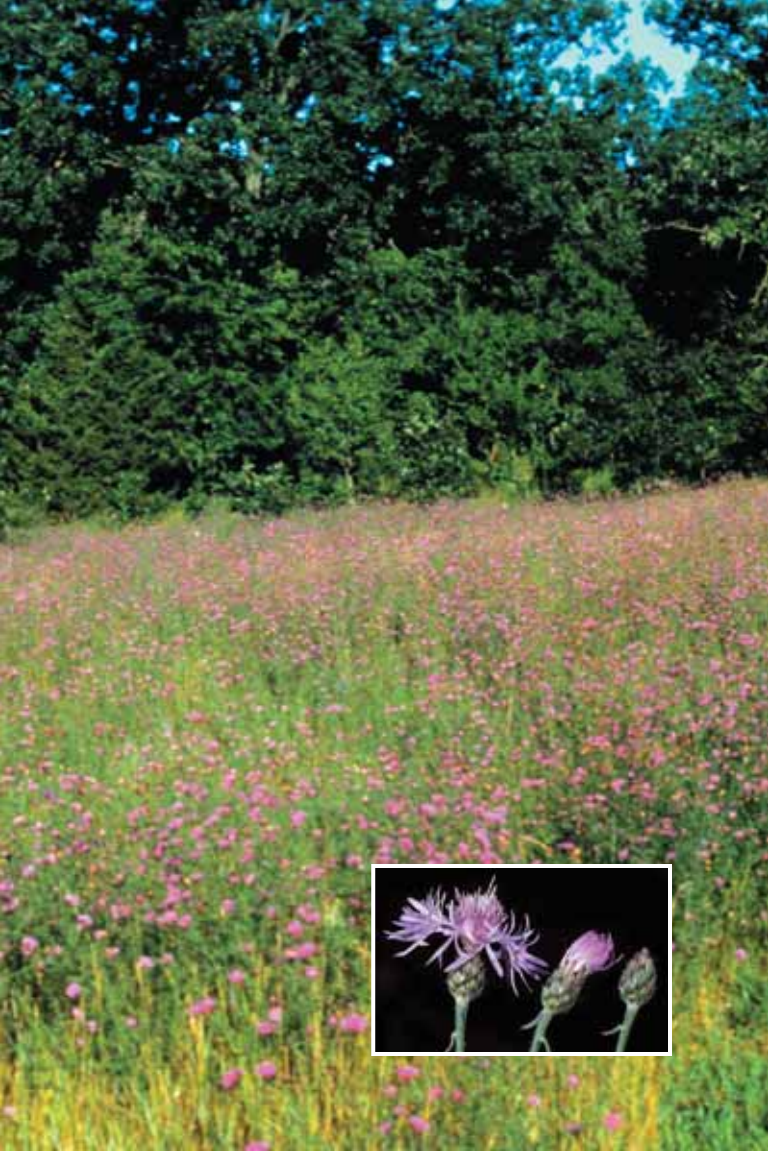
**Scientific Name:** *Acroptilon repens* (L.)

**Family:** Asteraceae (Sunflower)

**Description:** Russian knapweed is a creeping perennial forb that forms dense colonies from a deep (up to 20 to 30 feet) spreading root system. Roots are typically dark brown or black. Above-ground portions of the plant grow up to 4 feet. Lower leaves range from entire to lobed. Upper leaves are smaller, entire, and directly attached to the stem. Cone-shaped, pink to lavender flower heads are up to 1/2 inch in diameter and are borne at the end of leafy branches. Floral bracts are papery thin and smooth, greenish with a rounded or pointed margin.

**Origin:** Eurasia.

**Distribution/Comments:** It is a serious problem in northeastern and southeastern Arizona. Like yellow starthistle, Russian knapweed can cause “chewing disease” in horses. Its deep, perennial root system makes control efforts difficult once established.



## #14

### Spotted knapweed

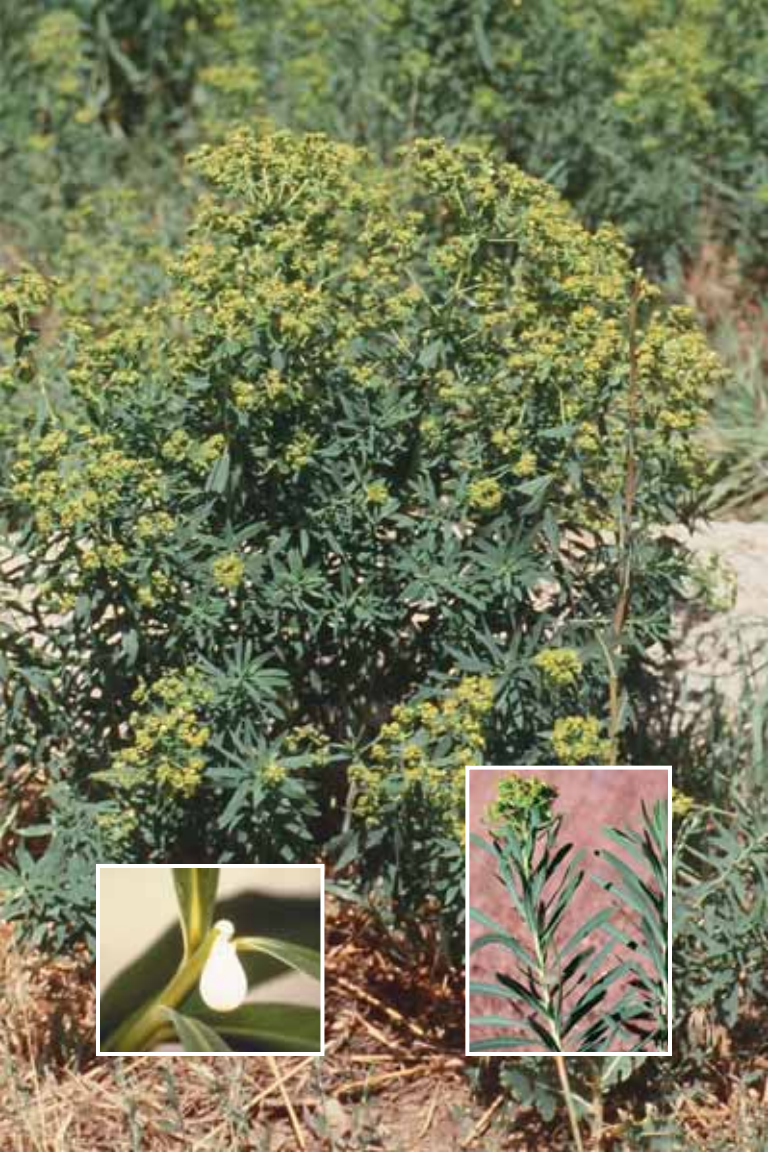
**Scientific Name:** *Centaurea maculosa* (Lam.)

**Family:** Asteraceae (Sunflower)

**Description:** Spotted knapweed is a simple perennial forb that grows 1 to 3 feet tall. It reproduces from seed (primary means of spread) and forms a new shoot each year from a taproot. Basal rosette leaves can be up to 6 inches long and are deeply lobed (similar to diffuse knapweed). Pinkish-purple, lavender, sometimes cream-colored, flower heads are solitary at the end of branches, and are about the same size as diffuse knapweed flowers (#12). Floral bracts are fringed and “comb-like” with stiff dark tips that give, the appearance of “spots.” Bracts have obvious vertical veins below the tips and a reduced central spine.

**Origin:** Eurasia.

**Distribution/Comments:** Spotted knapweed is sometimes confused with diffuse knapweed but control practices are similar for both species. Both species have been confirmed around Flagstaff and are aggressive competitors that displace native vegetation in rangelands, meadows, pastures, wildlife habitat, and recreational areas. One Montana study documented severe soil erosion losses on watersheds infested by spotted knapweed.



#15

## Leafy spurge

**Scientific Name:** *Euphorbia esula* (L.)

**Family:** Euphorbiaceae (Spurge)

**Description:** Leafy spurge is an aggressive, creeping, perennial forb with a root system that can extend into the soil as far as 30 feet. Leaves are 1 to 4 inches long, are linear, alternate, and entire (several times long as wide). Stems are thickly clustered and smooth, and exude a milky latex juice when broken. Small, yellowish-green flowers are enclosed by paired, heart-shaped yellow-green bracts. The fruiting structure is a 3-celled capsule, with each capsule containing a single seed. Capsules rupture at maturity and disperse seeds as far as 15 feet.

**Origin:** Eurasia.

**Distribution/Comments:** This plant has caused severe eye and skin irritations in livestock and in some people. Its encroachment on Wyoming, Montana and Dakota rangelands has cost millions of dollars due to losses in forage for livestock and habitat for wildlife, and as a result of diminishing recreation values on infested lands. It is a serious problem near Flagstaff and Springerville, Arizona.



## #16 Onionweed

**Scientific Name:** *Asphodelus fistulosus* (L.)

**Family:** Liliaceae (Lily)

**Description:** Onionweed is an erect, herbaceous perennial with leaves like onions. However, it does not produce bulbs or have an onion odor. Its root system is a dense mass of fibrous roots. Fruiting structure is a spherical, 3-segmented capsule that is approximately 1/4 inch in diameter. Flowers typically consist of 6 white or pink petals with a red-brown or dark brown mid-vein. Petals are about 1/2 inch long and flower diameter is approximately 1 inch. Flower stems and leaves are fleshy and hollow structures like tubes. Leaves are all basal, narrow, flat on one side, and up to 15 inches long. Height of vegetative growth is less than 18 inches and maximum flower stalk height is 2 1/2 to 3 feet.

**Origin:** Eurasia and the Mediterranean region.

**Distribution/Comments:** Onionweed is a federally listed noxious weed. Arizona populations are known to occur in Sedona, Tombstone, Bisbee and Sierra Vista, along roadsides, and in urban areas.





#17

## Malta starthistle

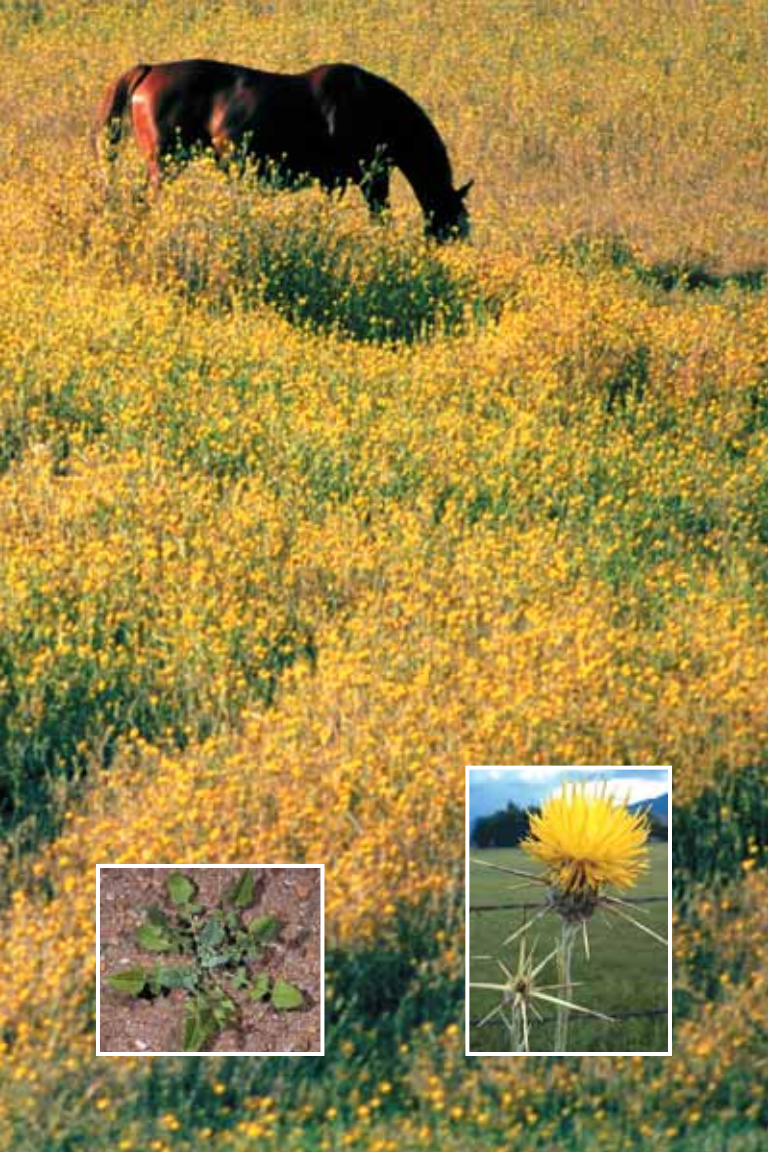
**Scientific Name:** *Centaurea melitensis* (L.)

**Family:** Asteraceae (Sunflower)

**Description:** Malta starthistle is a cool-season annual forb that grows 1 to 3 feet tall. Short-stalked, lobed basal leaves form a rosette. Upper leaves are narrow and pointed. An extension of the leaf blade forms a “wing” down the stem. Stems are erect, branched, rough, and hairy. Yellow flowers develop with floral bracts that are tipped with many slender, but short spines (less than  $\frac{3}{4}$ -inch, cf. yellow starthistle #18) that may appear yellow, brown, or purple in color.

**Origin:** Mediterranean region.

**Distribution/Comments:** Malta starthistle is a close relative of yellow starthistle and readily infests disturbed sites. It is especially problematic along roadsides in and around Tucson, and in the upper Sonoran Desert, semi-desert grasslands, and interior chaparral.



## #18

### Yellow starthistle

**Scientific Name:** *Centaurea solstitialis* (L.)

**Family:** Asteraceae (Sunflower)

**Description:** Yellow starthistle is an aggressive, cool-season annual forb. It germinates during cooler temperatures and grows 2 to 3 feet tall as temperatures warm. Deeply lobed basal leaves form a rosette, while stem leaves are linear or tapered at both ends and attach directly to the stem. An extension of the leaf runs down the stem, giving it a “winged” appearance. Flowers are yellow and are held by bracts that produce stiff, sharp spines that can grow up to 1 inch long (cf. malta starthistle, #17). Seed produced from ray-shaped flowers are dark-colored and lack bristles, while seed from disk flowers are lighter-colored and have a tuft of white bristles.

**Origin:** Mediterranean region.

**Distribution/Comments:** Like Russian knapweed, yellow starthistle can cause “chewing disease” in horses. The Tonto Weed Management Area in Gila County was formed primarily to address the spread of this weed.



#19

## **Bull thistle**

**Scientific Name:** *Cirsium vulgare* (Savi Tenore)

**Family:** Asteraceae (Sunflower)

**Description:** Bull thistle, like musk and scotch thistle, is a biennial forb that forms a rosette in its first year and then bolts and produces seed in its second year. Second-year leaf lobes are double-toothed and end in a spine. Leaves have wavy margins with prickles on the surface and pubescence on the underside. Stems are very pubescent and have dark purple veins. Flower heads produce red or purple flowers that can grow up to 2 inches wide. Bracts are narrow and spine-tipped. Seeds are topped with a pappus. The root system is short and fleshy.

**Origin:** Eurasia.

**Distribution/Comments:** Bull thistle, although widely distributed throughout Arizona, is less aggressive than the other non-native thistles that occur in the state. It typically grows as a few scattered individual plants or populations, primarily at higher, moister sites above 5000 feet.



#20

## Canada thistle

**Scientific Name:** *Cirsium arvense* (L. Scop.)

**Family:** Asteraceae (Sunflower)

**Description:** An erect perennial forb, it grows to 1½ to 4 feet tall, with ridged stems becoming hairy and branching at maturity. Leaves are alternate, lance-shaped, and irregularly lobed with spiny toothed margins. Flowers are usually purple (occasionally white) and typically bloom from June to September. Unlike musk and bull thistle, Canada thistle does not have spines on its flowers or stems. Fruits are small flattened brown achenes with bristly plumes. Horizontal roots may extend 15 feet or more and vertical roots may grow 6 to 15 feet deep. Male and female flowers develop on separate plants. Plants are dioecious, i.e., they develop either male or female flowers, and grow in circular patches that often are one clone and sex.

**Origin:** Eurasia.

**Distribution/Comments:** Generally, vegetative reproduction from its root system contributes to local spread but seeds contribute to long distance dispersal in a variety of ways (i.e., wind, water, attaching to animals, clothing, vehicles and farm equipment, via contaminated crop seed).





## #21

### Musk thistle

**Scientific Name:** *Carduus nutans* (L.)

**Family:** Asteraceae (Sunflower)

**Description:** Musk thistle has been classified as a biennial forb, but it can also grow as an annual. It has a thick tap root from which a rosette of basal leaves emerges. Rosettes grow 3 to 4 feet in diameter. Leaves are hairless and have deep lobes, are dark green with a light green midrib, and a spiny margin. Leaves extend beyond the stem, giving the appearance of a “winged” stem. Large, “powder puff” flower heads (1½ to 3 inches in diameter) can be deep rose, purple violet, or white. Flower head weight bends stems downward which gives the appearance of “nodding” flower heads when the wind blows. One plant can produce up to 20,000 seeds with about a third of those being viable. It grows up to 8 feet tall with adequate soil moisture.

**Origin:** Europe.

**Distribution/Comments:** Musk thistle has broad ecological amplitude, growing in dry open rangeland and in wetlands. The key to controlling biennial invasive thistles (bull, musk, scotch) is to destroy them before they set seed. Spotty infestations occur in northern Arizona.



#22

## Scotch thistle

**Scientific Name:** *Onopordum acanthium* (L.)

**Family:** Asteraceae (Sunflower)

**Description:** Scotch thistle is an aggressive biennial forb that ranges in height from 2 to 12 feet. Stems have broad, spiny wings formed by leaf bases. Rosette leaves are very large (up to 2 feet long and 1 foot wide), spiny, and covered with a dense mat of hairs that give the plant a grayish color. Stem leaves are also hairy, alternate, and coarsely lobed. Flowers are violet to reddish, grow up to 2 inches in diameter, and look like a “shaving brush.” Spiny bracts surround each flower head.

**Origin:** Europe.

**Distribution/Comments:** It is present in every northern county in Arizona. It is an imposing thistle due to its size and formidable spines which negatively impacts livestock forage production, wildlife habitat, and recreational values.



#23

## African sumac

**Scientific Name:** *Rhus lancea* (L.)

**Family:** Anacardiaceae (Cashew)

**Description:** This is an evergreen tree with a single or multi-stemmed trunk. African sumac can grow to a height of 30 feet with a crown of equal size. Leaves are a shiny dark green, 2 to 3 inches long and 1/2 inch wide in groups of 3 resembling that of a willow. Fruit is yellow to red and like a berry containing black seeds. Female plants have minute, light-green flowers borne in dense clusters. Bark is brownish-gray with an orange-mahogany underlayer appearing through fissures.

**Origin:** South Africa.

**Distribution/Comments:** It is widely used in landscaping due to drought tolerance and low maintenance requirements. African sumac establishes easily from seed.



## #24 Camelthorn

**Scientific Name:** *Alhagi pseudalhagi* (Bieb. Desv.)

**Family:** Fabaceae (Pea)

**Description:** Camelthorn is an aggressive creeping perennial shrub with an extensive root system. It is a “nitrogen fixer” that reproduces by seeds and by extensive, deep-penetrating and horizontally spreading roots. Seeds are housed in jointed seedpods that appear maroon to red in color. Greenish stems are typically tipped with slender greenish-yellow spines that grow  $\frac{1}{4}$  to  $1\frac{3}{4}$  inch long. Leaves are alternate, hairless on the upper surface, but pubescent on the underside.

**Origin:** Asia, India, Russia.

**Distribution/Comments:** Camelthorn currently has a scattered distribution throughout the northern counties of Arizona. It is especially problematic near the towns of Winslow and Holbrook where it has caused extensive damage to highways, walkways, and housing foundations. Its creeping root system helps form dense monocultures creating problems for farmers, ranchers, and recreationists.





#25

**Pentzia, African sheepbush**

**Scientific Name:** *Pentzia incana* (Thunb. Kuntze)

**Family:** Asteraceae (Sunflower)

**Description:** *Pentzia* is a 1 to 1½ feet tall, multiple branched, perennial shrub with grayish leaves covered with matted hairs. Leaves are alternate, once pinnatifid, marked with pits, and have revolute margins. The small yellow discoid flowers are in terminal heads enclosed by graduated phyllaries. Inter-phyllaries have scarious margins. Fruits are 5-angled achenes with cup-shaped, scarious crowns of scales. Leaves and stems have a strong pineapple scent when crushed.

**Origin:** South Africa.

**Distribution/Comments:** *Pentzia* is found in isolated areas of central and southern Arizona, particularly in chaparral vegetation types. Like sweet resinbush infestations, *pentzia* infestations are associated with Civilian Conservation Corps work areas who planted these plants to stabilize the soil during the “dust bowl” days in the 1930’s. Detected populations have typically been less than 10 acres in size.



**#26**  
**Russian olive**

**Scientific Name:** *Elaeagnus angustifolia* (L.)

**Family:** Elaeagnaceae (Oleaster)

**Description:** Russian olive can grow as a small, thorny shrub or as a deciduous tree that can grow up to 40 feet tall. All parts of the stems, buds, and leaves have a dense covering of silvery to rusty scales. The bark is smooth and gray when young, but develops ridges and furrows with age. The leaves are 1 to 3 inches long and about 1/2 inch wide, are simple, alternate, and are usually egg or lance-shaped with smooth margins. Flowers are aromatic, creamy-yellow, and bell-shaped. Fruits are like silver berry achenes about 1/2 inch long that appear in clusters usually during late summer and early fall.

**Origin:** Eurasia.

**Distribution/Comments:** Russian olive can be found near streams, fields and open areas in Arizona. Its fruit is readily eaten and disseminated by many species of birds. It has the ability to “fix” nitrogen and is easily established on bare soils and in riparian areas. Establishment and reproduction is primarily by seed although some vegetative propagation also occurs.



#27

## Sweet resinbush

**Scientific Name:** *Euryops subcarnosus* ssp. *vulgaris* (DC)

**Family:** Asteraceae (Sunflower)

**Description:** Sweet resinbush is a low-growing, medium-sized shrub (usually less than 3 feet tall). Its small leaves are about 1 inch long. Each leaf is divided into 3 to 5 narrow lobes that look like tiny turkey tracks. The shrub usually sheds its leaves during dry seasons and blooms in late winter to early spring. Hundreds of small inflorescences similar to daisies may hide the green leaves. The name, sweet resinbush, comes from the sweet, but disagreeable, odor of the flowers and the drops of resin exuded by the woody stems.

**Origin:** South Africa.

**Distribution/Comments:** Sweet resinbush was introduced to central and southern Arizona in the 1930's to provide livestock forage and to control soil erosion. Because this shrub has proven to be highly invasive in semi-arid grassland areas, several projects have been initiated to eradicate or manage it in the southern half of Arizona.

It occurs primarily below the Mogollon Rim in Arizona. Time will tell whether it is able to survive the colder climates in northern Arizona.



**#28**  
**Tree of Heaven**

**Scientific Name:** *Ailanthus altissima*  
(P. Mill. Swingle)

**Family:** Simaroubaceae (Quassia)

**Description:** This fast-growing, deciduous, dioecious tree, grows 50 to 80 feet tall. Its large compound leaves, 1 to 4 feet in length, are composed of 11 to 25 smaller lance-shaped, pointed leaflets that alternate along the stems. Each leaflet has 1 to several glandular teeth near the base. Staminate flowers appear in small terminal clusters and have a very strong, offensive odor. The yellowish-green, 1/4 inch long, pistillate flowers are in dense terminal clusters. The 1 to 1 1/2 inch reddish-brown fruits are twisted, winged, and appear in dense clusters. It reproduces by seed and root suckers.

**Origin:** China.

**Distribution/Comments:** Tree of Heaven is found in towns and along streams throughout much of Arizona. It is a common ornamental in many mining communities (i.e., Bisbee, Jerome).





## #29

### Feathered mosquitofern

**Scientific Name:** *Azolla pinnata* (R. Br.)

**Family:** Salviniaceae (Water fern)

**Description:** Feathered mosquitofern is an annual aquatic, free-floating fern that consists of small (less than 1 inch), triangular-shaped “fronds.” Individual plants clump together and blanket open water in a “velvety” reddish and green color. Fine lateral rootlets appear “feathery” in the water. When fertile, very small (less than 1/8 inch) round sporocarps can be seen on the undersides of the frond branches. Multiplying both vegetatively and by spores, mosquitofern can double its biomass in 5 to 10 days.

**Origin:** Africa, Australia, China, India, Japan, Malaysia, the New Guinea mainland, Philippines, and southeastern Asia.

**Distribution/Comments:** Feathered mosquitofern reduces oxygen levels and degrades water quality in slow moving riparian areas. It is an occasional contaminate in holding tanks where backyard pond plants are sold in Phoenix and Tucson but is not known to have established any population in natural or constructed water resources in Arizona.



## #30

### Floating water primrose

**Scientific Name:** *Ludwigia peploides* (Kunth.)  
*Raven ssp. glabrescens* (Knutze)

**Family:** Onagraceae (Evening primrose)

**Description:** This robust, aquatic, freshwater perennial grows upright as a dense sprawling, tangled mat of vegetation. Its bright yellow, 1 inch flowers usually have 5 petals that bloom throughout the summer. Leaves are “willow-like”, alternate, simple, slightly hairy, and elliptic to obovate with entire margins. Fruits are capsules that contain many tiny yellow ellipsoid seeds. Reproduction is by seed and by vegetative fragments.

**Origin:** South America.

**Distribution/Comments:** Dense mats alter native aquatic ecosystems, provide mosquito habitat, and impede navigation. It is in the Verde River from Clarksdale downstream to the Salt River and also occurs along some stretches of the Salt and Gila River. It can be common in areas where urban, agricultural, and industrial waste water create wetland habitats.



## #31

### Giant cane, giant reed grass, elephant grass

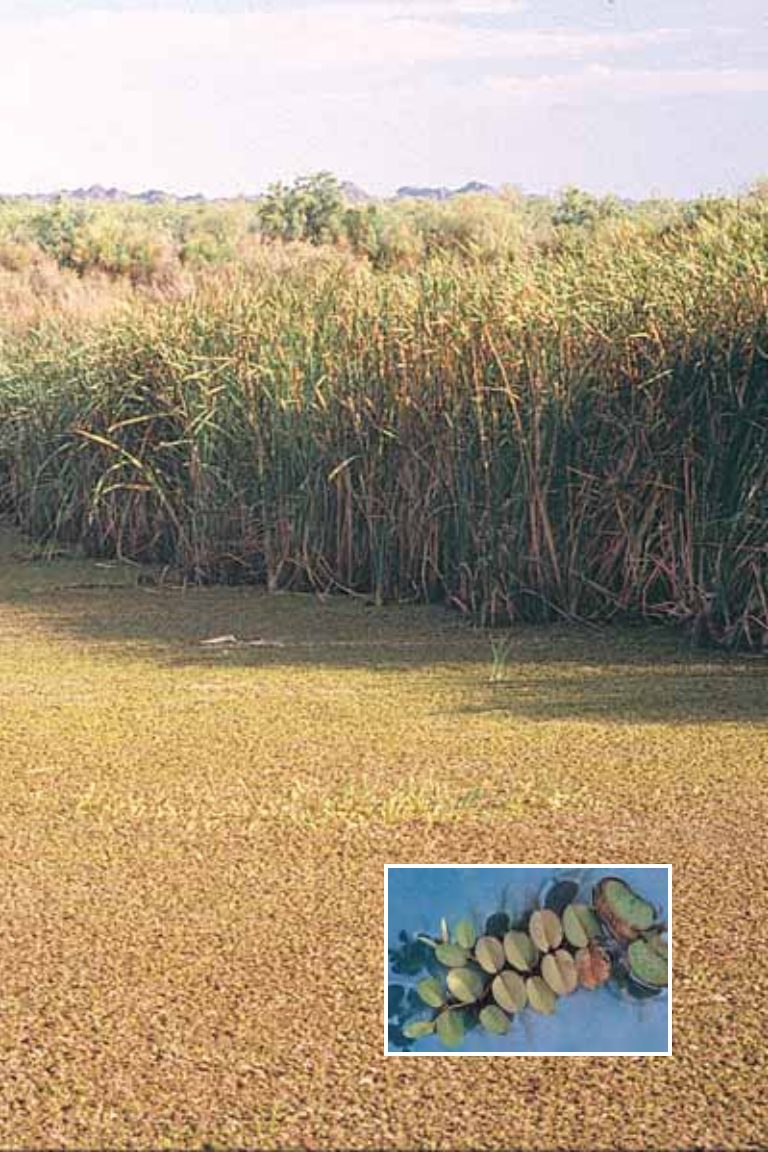
**Scientific Name:** *Arundo donax* (L.)

**Family:** Poaceae (Grass)

**Description:** Giant cane is a multi-branched, perennial “cane” with numerous culms that grow from root clumps that can expand to 10-20 feet in diameter. Creeping rootstocks (rhizomes) grow from clumps and bear fibrous roots which may extend 15 to 20 feet from the clump. Above ground plant parts may grow 6 to 20 feet tall. Broad, linear, fibrous leaves are glabrous or scabrous. Woody culms are 1/2 to 1 1/2 inches in diameter, hollow between internodes, and support leafy branches at nodes and panicles shaped like plumes. Reproduction is primarily vegetative via “spears” from rhizomes or vegetative stem fragments that form new stems and roots. Growth can occur throughout the year depending on location.

**Origin:** Europe.

**Distribution/Comments:** Giant cane grows in scattered populations in moist sites across southern and central Arizona. It is a concern along the Gila, Salt, San Pedro and Verde River systems as well as Aravaipa Creek and Sabino Canyon. It has also been planted as an ornamental in yards and as windbreaks along irrigation ditch banks.



#32

## Giant salvinia

**Scientific Name:** *Salvinia molesta* (Mitch)

**Family:** Salviniaceae (Salvinia)

**Description:** Giant salvinia is a free-floating aquatic fern, consisting of a horizontal stem lying just below the water surface. Nodes along stems produce a pair of ovate to oblong floating leaves, or highly dissected submerged leaves that resembles roots. Stems fragment as colonies enlarge and new plants develop from apical and lateral buds. Dormant buds can withstand periods of stress from low temperatures and drying. It can completely dominate slow-moving or quiet freshwaters during warmer periods of the year.

**Origin:** Southeastern Brazil.

**Distribution/Comments:** Giant salvinia was discovered in the Colorado River in 1999. It has negative impacts on wildlife and fishery habitats, on agriculture, and on recreational activities. Boaters must make certain not to transport this invasive aquatic weed on gear or watercraft. It has been reported as being sold by some nurseries in Phoenix.





## #33 Hydrilla

**Scientific Name:** *Hydrilla verticillata* (L. F.)

**Family:** Hydrocharitaceae (Frog's bit)

**Description:** Hydrilla is a submerged perennial aquatic plant. Stems can reach a length of 30 feet, becoming heavily branched at the water surface. Large clumps can separate from stems at the surface allowing them to be moved by water currents. Leaves are arranged in whorls of 3-8, are small, 1/4 inch wide and up to 1 inch long, with pointed tips. Flowers are inconspicuous and can either have 3 translucent (female) or 3 white-reddish (male) petals. Hydrilla can spread from seed, stolons, rhizomes, tubers, or turions. Tubers form on the ends of rhizomes. Turions are buds that form in leaf axils and fall off to form new plants.

**Origin:** Dioecious (female) plants originated in southern India, while the monoecious (male) plants probably came from Korea.

**Distribution/Comments:** Known populations are limited to 2 golf course ponds, one in Tucson and another in Phoenix. Hydrilla's reproductive potential poses tremendous threats to aquatic habitats and irrigation water flow.



#34

**Parrot feather watermilfoil (parrot feather)**

**Scientific Name:** *Myriophyllum aquaticum*  
(Vell. Verdc.)

**Family:** Haloragaceae (Water milfoil)

**Description:** This freshwater species gets its name from feathery leaves arranged around the stem in whorls of 4 to 6. Emerged leaves look like small fir trees growing above the water surface. Rhizomes function as adventitious roots and provide buoyancy for emergent growth in the summer. Male plants are unknown outside its native range, so no seeds are produced in North American populations. Plants spread exclusively from vegetative fragments. In fall, plants die back to the rhizomes.

**Origin:** South America.

**Distribution/Comments:** This species was introduced worldwide for use in indoor and outdoor aquaria, but has escaped cultivation and has been confirmed in backwater lagoons and canals along the lower Colorado River near Yuma as far north as the Imperial Reservoir. Mat formations provide habitat for mosquitoes. Other adverse impacts include altering native aquatic ecosystems and impeding navigation.

## Glossary of Common Plant Terminology

**Alternate**—Leaves that are arranged singly up the stem; not opposite each other.

**Annual**—A plant that completes its life cycle in one year and reproduces only by seed.

**Auricle**—Lobelike structures at the collar region of a grass leaf blade.

**Awn**—Slender bristle at the tip of grass seed structures.

**Axil**—The angle formed between a leaf and a stem.

**Basal**—At the base of a plant or plant part.

**Biennial**—A plant that completes its life cycle in two years. Usually forms a rosette of basal leaves the first year then sends up fruiting structure the second year. It reproduces only by seed.

**Bract**—Leaflike structure at the base of a flower or leaf.

**Calyx**—All the flower leaves together, normally green in color.

**Clasping leaves**—Leaves whose bases appear to wrap around the stem.

**Crown**—The structure formed where leaves, stems, and roots grow together.

**Dissected**—Deeply and repeatedly divided into smaller parts.

**Entire**—Not toothed or otherwise cut.

**Head**—A group of flowers borne together in a common receptacle.

**Ligule**—The structure at the collar of a grass leaf between the sheath and the stem.

**Linear**—Long and slender.

**Lobed**—A cut into a leaf from the edge toward the center; deeper cut than “toothed.”

**Margin**—The edge of a leaf.

**Membranous**—Thin and flexible, usually not green.

**Midrib**—The center and most often the dominant vein on a leaf.

**Nodding**—A flower that is bent downward or sidewise on the stem.

**Opposite**—Leaves situated directly across the stem from each other.

**Panicle**—A many-branched inflorescence.

**Pappus**—Bristles, scales, awns, or feathery appendage on the seed of members of the sunflower family.

**Perennial**—A plant that lives for more than two years as a result of some form of a vegetative reproductive structure. Spread and reproduction is both sexual (seed) and asexual (vegetative).

**Petiole**—A leaf stalk.

**Pubescence**—The hairs on a leaf, stem, or flower. The degree of pubescence is an important characteristic.

**Rhizome**—A creeping, underground stem.

**Rosette**—A circular, basal cluster of leaves on biennial plants.

**Sheath**—The extension of the leaf that surrounds the stem.

**Serrate**—Saw-toothed.

**Spur**—A hollow appendage on a flower.

**Stolon**—A creeping stem on the surface of the soil.

**Succulent**—Fleshy and juicy.

**Taproot**—A thick, central root having little or no branching.

**Vegetative**—Asexual reproductive structures such as rhizomes, crowns, and stolons that are found in perennial plants.

**Whorled**—Three or more similar structures arranged at a common junction.

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## **Arizona Noxious, Invasive Weed Reporting Form**

**Instructions:** Please copy this form and fill it out as completely as possible with the requested information. If you send more than one plant, include a form for each plant. Send a sample of the weed you want identified along with the form. Send as much of the weed as possible including flowers and/or seeds if available. Remove as much soil as possible from the plant and wrap in a dry paper towel. Please sketch a detailed map so that the location can be easily found. Place plant, towel, and the copied form in a plastic bag and mail to:

**Arizona Department of Agriculture  
Attention: Noxious Weed Coordinator  
1688 West Adams  
Phoenix, Arizona 85007**

Date: \_\_\_\_\_

Surveyor: \_\_\_\_\_

(Name and affiliation)

Phone: \_\_\_\_\_

(Daytime)



## **Arizona Noxious, Invasive Weed Reporting Form**

Weed Species (if known):

Estimate of Infestation (acreage and density):

Specific Location (for example):

- Township, Range, Section description  
(i.e., SW  $\frac{1}{4}$  of the SE  $\frac{1}{4}$ )
- GPS Coordinates (specify lat/long, UTM, etc.)
- Highway and mile marker

Descriptive Location (identifying landmarks, directions to site, or draw map):

Site Description (Roadside, rangeland, pasture, forest, riparian, specific crop, etc.; land ownership, if known):

Other Comments:

## **ORGANIZATIONS THAT CAN PROVIDE INFORMATION ON INVASIVE WEEDS**

United States Forest Service, [www.fs.fed.us](http://www.fs.fed.us)

National Resources Conservation Service,  
[www.nrcs.usda.gov](http://www.nrcs.usda.gov)

Bureau of Land Management, [www.blm.gov](http://www.blm.gov)

Fish & Wildlife Service, [www.fws.gov](http://www.fws.gov)

National Park Service, [www.nps.gov](http://www.nps.gov)

Arizona Department of Agriculture,  
[www.agriculture.state.az.us](http://www.agriculture.state.az.us)

The University of Arizona Cooperative Extension,  
[www.ag.arizona.edu/extension](http://www.ag.arizona.edu/extension)

Arizona Game and Fish Department,  
[www.gf.state.az.us](http://www.gf.state.az.us)

Arizona State Land Department, [www.land.state.us](http://www.land.state.us)

Invaders Database System, [www.invader.dbs.umt.edu](http://www.invader.dbs.umt.edu)

Southwest Exotics Mapping Program,  
[www.usgs.nau.edu/ims/swemp/exotics.html](http://www.usgs.nau.edu/ims/swemp/exotics.html)

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