Clockwise from top: Tamarix parviflora (Saltcedar); fall colors; leaves of tamarix; Tamarix remosissima (Saltcedar) flowers. Leaves photo anonymous. All other photos by John M. Randall, The Nature Conservancy.

SPECIES:
Tamarix:
T.chinensis,
T.parviflora,
T.ramosissima
(Saltcedar)

IMPACTS AND THREATS

Tamarix is a common invasive plant to many river courses. It uses more water than comparable native plant communities. It is tolerant of highly saline habitats, and concentrates salts in its leaves. As leaf litter accumulates under tamarisk plants, the surface soil can become too saline to allow any other plants to establish. It also provides lower wildlife habitat value than native vegetation. During the winter, tamarix has only 39 percent of the density of birds as other native vegetative communities.

There is a large evergreen tree, Tamarix aphylla, which is not as invasive as the deciduous tamarix species. Large (greater than 20 feet) "athel" tamarix should be preserved.

DESCRIPTION AND DIAGNOSTIC CHARACTERISTICS

Form: The target Tamarix species are deciduous, loosely branched messy shrubs up to 10 feet tall. The branchlets are slender with minute scaly leaves. The tiny leaves are pointy ovals, ranging from 0.5 –3.0 mm long. They propagate from buried or submerged stems.

Flower/seed: Flowers are whitish or pinkish and borne on slender long branchlets on the current year's branches and are grouped together in terminal panicles. The flowers are most abundant between April and August, and can produce massive quantities of small seeds.

MANAGEMENT AND ERADICATION TECHNIQUES

Tamarix can be controlled by several methods, but cutting the stem and applying herbicide, known as the cut-stump method, is most often employed. This method is used in stands where other native plants are present. Individual tamarisk plants are cut as close to the ground as possible with chain saws, loppers or axes, then herbicide applied on and around the cut stems within one minute or so. All stem fragments can potentially sprout new plants, so all cuttings must be removed. Use herbicides triclopyr (Garlon4®, PathfinderII®) or imazapyr (Arsenal®). This is most effective in the fall. Retreat any re-sprouts 4 to 12 months following initial treatment.

It is essential to continue to monitor and control tamarisk indefinitely. Follow-up control is likely to require less labor and materials than initial control efforts.

FOR ASSISTANCE, CONTACT JENNIFER BECKER OR JULIA FONSECA OF PIMA COUNTY REGIONAL FLOOD CONTROL DISTRICT AT 520.243.1800.

08/2007

WIPE OUT WEEDS

PIMA COUNTY BOARD OF SUPERVISORS: Ramón Valadez, Chairman, District 2; Ally Miller, District 1; Sharon Bronson, District 3; Ray Carroll, District 4; Richard Elías, District 5
COUNTY ADMINISTRATOR: C.H. Huckelberry

Pima County Regional FLOOD CONTROL DISTRICT

Clockwise from top: Centaurea solstitialis L. (yellow starthistle); dried out starthistle plant at "Q-tip" stage; young starthistle plant; yellow starthistle; and yellow starthistle flower on left and Malta starthistle flower on right. Photos by John M. Randall, The Nature Conservancy.

SPECIES:
Centaurea solstitialis L. (yellow starthistle) &
Centaurea melitensis (Malta starthistle)

IMPACTS AND THREATS

Starthistle infestation in Arizona may be low at present. A single plant can produce up to 150,000 seeds in one year. Seeds begin to germinate in the fall, but can continue to germinate into the spring. Some seed is viable ***8 days*** after flower initiation. Seed can survive for 10 years, but most seeds survive 2-3 years. Dense infestations will displace native plants.

DESCRIPTION AND DIAGNOSTIC CHARACTERISTICS

Form: Yellow Starthistle is a 2 to 5 feet tall winter annual. It has a basal rosette of deeply lobed leaves. Upper leaves are linear, on ridged winged stems. The whole plant is covered in thin cottony fuzz. Seedlings sprout and form rosettes with the rain in the fall or spring, then flower in warm weather. In very cold weather the mature plant may lose its leaves and dry to a silvery-grey skeleton with white cottony seed-heads, resembling "Q-tips."

Flower/seed: Both malta and yellow starthistle flower are bright yellow with a distinctive spiny bud. Both have prominent spines radiating from the flower base, but the spines on yellow starthistle flowers are longer, stiff, and pointed like a cactus spine. Malta spines are shorter, less rigid, with three or four pairs of smaller spines at the base.

MANAGEMENT AND ERADICATION TECHNIQUES

Monitoring and spot eradication of plants when they are discovered can prevent the spread of starthistles. It is possible to substantially reduce the infestation with one year of control, but an established starthistle population will require a longer-term management program.

Management techniques can prevent seed production and control infestations. Mowing and other methods must be properly timed to be effective. Mowing is most effective when plants are cut below the height of the lowest branches and timed with when 2-5 % of the total population of seed heads is in bloom; mowing too early can result in higher seed production. All starthistles are highly susceptible to the herbicides clopyralid (late fall to early spring) and glyphosate (anytime when plants are not in drought stress). Prescribed burns can provide control if implemented after annual plants have dried, but before seed is produced. Burning at other times may enhance survival. To prevent re-infestation, vigilant monitoring and spot eradication may be required indefinitely.

SPECIES:
Pennisetum setaceum (Fountain grass)

IMPACTS AND THREATS
This robust perennial clumping grass is a common landscape ornamental and it is increasingly spreading into natural habitats, especially in washes where it displaces native grasses and other vegetation. Although fountain grass usually doesn't spread as fast as buffelgrass, it also causes habitat-displacing fires and loss of native vegetation.

DESCRIPTION AND DIAGNOSTIC CHARACTERISTICS
Form: Densely clumped growth form with erect stems, usually 1.5 to 4 feet tall. Slender leaves are bright green or purplish, but can be reddish in cooler weather. Plant spreads by seed or root runners.

Flower/seed: Blooms in summer and fall, depending on rain. Tall, 6 to 15 inches long feathery flower heads resemble bottlebrushes with many small off-white, pink or purple flower seeds. Field evidence in Hawaii suggests that seeds may survive for 6 years in the soil seed bank.

MANAGEMENT AND ERADICATION TECHNIQUES
There are two main ways to eradicate fountain grass. Herbicides are usually effective on actively growing portions of plant, but successive re-treatment is commonly necessary to target previously dormant re-growth. Manual removal is effective when the root mass is entirely removed. Disking is not advised as it will expand the infestations by spreading the root nodules. Mowing is not an effective control method, but it can be coupled with herbicide treatment.

Chemical Control: Glyphosate/Roundup® can be effective at killing actively growing, green fountain grass. Follow the label directions; a 2% to 4% solution works well. Spray enough chemical on the plants to coat the leaves, but not so much that it runs off. Add a dye to the chemical solution to help avoid spraying non-target species. Plants must more than 60% green. Mowing and/or watering may force a green-up. Retreat as necessary.

Manual Control: A digging tool like a soil bar (caliche bar) is needed to loosen the soil around the plant so that the entire root base can be removed intact; any root nodules left behind will re-sprout. Wedge the soil bar point into the soil next to the base of plant at an angle; push down on soil bar to start to pry the plant out of the ground. Do this around several sides of the plant until the roots are loosened on all sides. Then pull up on all the leafy material at once, tugging from side to side. If two people are present, the soil bar can be used to pop the whole clump out of the ground while the second person pulls upwards on the plant. Shake loose dirt off roots and place clump in a heavy-duty trash bag.

At right: Pennisetum setaceum (Fountain grass) inflorescence. Photo by Mandy Tu, The Nature Conservancy. Above: Fountain Grass inflorescence. Photo by John M. Randall, The Nature Conservancy.

Clockwise from top: Typical buffelgrass appearance, photo courtesy of Jennifer Becker; Buffelgrass seed heads: mature and dry at left, young at right, photo courtesy of ASDM; Dry, dormant buffelgrass, photo courtesy of the Desert Laboratory; Actively growing and flowering buffelgrass, photo courtesy of ASDM.

SPECIES:
Pennisetum ciliare (Buffelgrass)

IMPACTS AND THREATS
Buffelgrass was introduced in Arizona as a forage crop. It is a fire-loving drought-tolerant perennial that spreads in wet or dry years. It forms dense infestations that crowd out native plants. Active or dormant plants can burn year round, producing very hot fires. A buffelgrass fire will kill most native plants in its path, because the Sonoran Desert isn't adapted to fire. Buffelgrass will produce new leaves and flower spikes very quickly after light rains almost anytime of the year, making it an extremely prolific seed producer.

DESCRIPTION AND DIAGNOSTIC CHARACTERISTICS
Form: Buffelgrass is a shrubby bunch grass 1.5 feet tall, 1 to 3 feet wide. Older plants branch densely, giving it a messy appearance. Tiny whitish hairs can be seen at the base of the leaf where it meets the stem. It can quickly green up after rains, and quickly dry down to a straw colored plant. Plant spreads by seed or root runners.

Flower/seed: Flower heads can be present in different stages throughout much of the year, even when rest of plant appears dormant. Flower looks like a bottle brush. The bent hairs on individual seeds make them look like soft burs. The seeds are a tan color when mature, but they are reddish to purplish when young. Once the seeds fall from the plant, the rachis (central stem where the seeds attach) is very rough to the touch. Field evidence from Arizona suggests that seeds may survive for 3 years.

MANAGEMENT AND ERADICATION TECHNIQUES
There are two ways to eradicate buffelgrass effectively. Herbicides are effective on actively growing portions, but re-treatment is commonly necessary to target re-growth. Manual removal is very effective if the root mass is entirely removed. Disking is not advised as it will expand the infestation by spreading root nodules. Mowing is not an effective control method, but it can be coupled with herbicide treatment. To prevent re-infestation, vigilant monitoring and spot eradication may be required indefinitely.

Chemical Control: Glyphosate/Roundup® can be very effective at killing actively growing, green buffelgrass. Follow the label directions. Spray enough chemical on the plants to coat the leaves, but not so much that it runs off. Add a dye to the chemical solution to avoid spraying non-target species. Plants must more than 50% green, which can happen when rains are good anytime between February and November. Mowing and/or watering may force a green-up. Retreat as necessary.

Manual Control: A digging tool like a soil or caliche bar is needed to loosen the soil around the plant so that the entire root mass can be removed intact; any root nodules left behind will re-sprout. Wedge the soil bar point into the soil next to the base of plant at an angle; push down on soil bar to start to pry the plant out of the ground. Do this around several sides until the roots are loosened on all sides. Then pull up on all the leafy material, tugging from side to side. If two people are present, the soil bar can be used to pop the whole clump out of the ground while the second person pulls upwards on the plant. Shake off loose dirt and place clump in a heavy-duty trash bag.