Rancho Vistoso Xero-Riparian Restoration Project
Maintenance Manual
May 26, 2009

This document is supplemental information to the Rancho Vistoso Xero-Riparian Restoration Project Narrative and Plan. It is intended to assist the landscape maintenance personnel in the field.

The WLB Group WLB PBS&J Vestar

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Plant Identification Sheets

All Year Round - Listed In order of removal priorty

Pennisetum ciliare - Buffelgrass
Pennisetum setaceum - Fountaingrass
Cynodon dactylon - Bermudagrass
Tamarix spp. - Salt cedar
Rhus lancea - African sumac
Parkinsonia aculeata - Mexican Palo Verde
Arundo donax - Giant reed
Nicotiana glauca - Tree tobacco
Bromus rubens - Red brome
Ailanthus altissima - Tree of heaven
Cortaderia selloana - Pampas grass

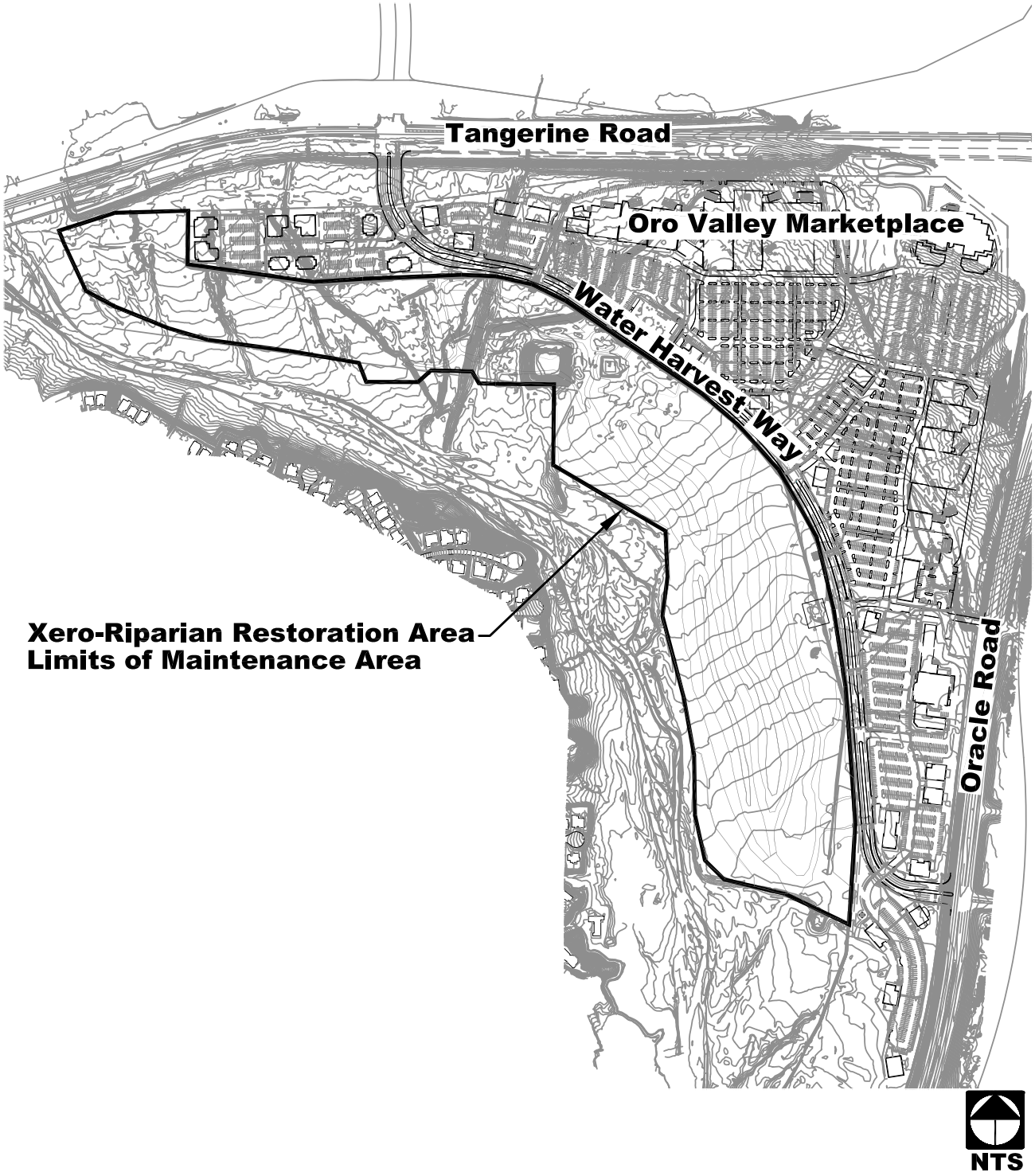
Late Winter - Listed In order of removal priorty

Salsola spp. - Russian thistle
Malva parviflora - Cheeseweed
Brassica tournefortii - Sahara mustard
Sisymbrium irio - London rocket
Sonchus oleraceus - Sowthistle
Erodium cicutarium - Filaree
Amaranthus palmeri - Pigweed - Careless weed

Late Spring / Summer - Listed In order of removal priorty

Sorgum halepense - Johnson grass
Centaurea melitensis - Maltese star thistle
Eragrostis Lehmanniana - Lehman's lovegrass

Site Plan - Limits of Maintenance Work



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Approved Plants

Scientific Name	Common Name
Acacia constricta	Whitethorn Acacia
Acacia greggii	Catclaw
Celtis pallida	Desert Hackberry
Cercidium floridum	Blue Palo Verde
Cercidium microphyllum	Little-Leaf Palo Verde
Chilopsis linearis	Desert Willow
Clematis drummondii	Virgin's Bower
Ferocactus wislizenii	Fish-hook Barrel Cactus
Lycium andersonii	Anderson Wolfberry
Prosopis velutina	Velvet Mesquite
Olneya tesota	Ironwood
Opuntia engelmannii	Engelmann's Prickley Pear
Opuntia spp.	Cholla
Yucca elata	Soap Tree Yucca
Zizyphus obtusifolia	Grey Thorn

Final Seed Mix

Scientific Name	Common Name
Acacia constricta*	Whitethorn
Ambrosia deltoides	Bursage
Aristida purpurea	Purple three-awn
Aristida ternipes	Aristida ternipes
Atriplex canescens	Four-wing saltbush
Baileya multiradiata	Desert Marigold
Bothriochloa barbinodis	Cane beardgrass
Bouteloua aristidoides	Needlegrass grama
Bouteloua curtipendula	Sideoats grama
Bouteloa rothrockii	Rothrock grama
Cassia covesii	Desert senna
Chilopsis linearis	Desert willow
Datura wrightii	Sacred Datura
Digitaria californica	Arizona cottontop
Encelia farinosa	Desert brittlebush
Ericamerica laricifolia	Turpentine bush
Eschscholzia mexicana	Mexican gold poppy
Gutierrezia sarothrae	Snakeweed
Kallstroemia grandiflora	Arizona poppy
Lesquerella gordonii	Bladder pod
Lupinus sparsiflorus*	Desert lupine
Lycium fremontii	Wolfberry
Penstemon parryi	Parry's penstemon
Plantago insularis	Indian wheat
Proboscidea parviflora	Devil's claw
Psilostrophe cooperi	Paper flower
Salvia columbiarae	Desert chia
Setaria macrostachya	Plains bristlegrass
Sporobolus airoides	Alkaki sacaton
Sporobolus crypthandrus	Sand dropseed

*Leguminous species should be inoculated with appropriate mycorrhizal inoculums. inoculate should be added to hydroseed mix at time of application.

Maintenance - Management Strategies

The restoration specialist shall conduct regular inspections in order to develop maintenance guidelines for the landscape contractor. Upon completion, inspections shall be conducted monthly during the first three months, quarterly during the initial two years, and semi-annually thereafter. Following each visit, letter reports outlining the status of the project will be prepared and presented to project developer, landscape contractor, and Pima County.

Maintenance consists of actions taken to ensure that the planted trees, shrubs, and groundcovers become established and provide the necessary cover, density, and diversity to meet the success criteria.

The maintenace includes supplemental planting, checking and maintaining irrigation lines, addressing soil fertility problems, and preventing excessive herbivory, repairing excessive erosion damage, removing weeds in a timely manner, and remedying mosquito and plant disease problems.

Management strategies will need to be adjusted as site conditions change and develop. Management will be most intense during the bi-modal growing season and less intense during the remainder of the year.

The restoration specialist will inspect the site per the approved schedule. The landscape contractor will maintain the site to acheive the 'success criteria'. The restoration specialist and landscape contractor shall meet onsite to review management needs at the regularly scheduled restoration inspection dates and adjust management practices as neccessary.

The restoration specialist will produce a memo for the landscape contractor and client after each inspection detailing specific action items. The restoration specialist and landscape contractor will work together closely to ensure that all recommendations are implemented promptly. The landscape contractor will have access to the restoration specialist for periodic plant identification and management guidelines.

The goal will be to eliminate the invasive species so that the native species present will be allowed to room to grow. Monitoring and management will help provide habitat improvement.

Several invasive non-native plant species are present within the big wash xero-riparian restoration project. These species can be expected to increase in number without the appropriate control measures.

Invasive species often produce enormous quantities of viable seed and can be very difficult to control once established. Therefore monitoring will be the key to management success for early detection and eradication.

Physical control is labor intensive but more often it is the most appropriate method of control. Physical methods of invasive species provides control while desirable species are left in place.

The species, location, and extent of invasive species infestation will largely determine the management tools used to control populations. These methods may include removal by hand or machine, preventative measures, (cutting seed heads off plants and raking and removing seeds as they fall to the ground) and/or applications of herbicides.

Optimum timing of invasive species can be critical. For example, many perennial species, timing of control may not be as critical as for annual species. Annual species controlled before they set seed can limit costly repeat efforts.

Success Criteria

Ongoing monitoring will ensure success in controlling problem species. Successful management / control will require less man power in the long term. The monitoring and management strategies are to be implemented over five years from the intial start date **(05/08/2009)** of the maintenance period. The success of the restoration project will largely depend upon the control of invasive species which compete with native species.

Monitoring is the key tool to for detecting the establishment of high priority invasive species within a given area. Then eradicating high priority species immediately upon detection. (priority species may vary per season)

Success criteria: Are specific to each of the proposed vegetation types to be restored. The restored habitat will be deemed successful when the following criteria are met.

Cover: Native, perennial plants shall provide 20 percent absolute cover after 2 years, and 50 percent cover after 5 years for the *streambank and stream channel areas*. Native, perennial plants shall provide 10 percent absolute cover after 2 years, and 25 percent cover after 5 years for *the upland planting areas*.

Density: Average density of native woody shrubs and trees will be at least 235 individuals per acre for the *streambank and stream channel* plantings, and 130 for the *upland planting areas*.

Exotics: Non-native, perennial groundcovers shall not exceed 10 percent absolute cover. Annual non-native grasses will not be counted in this 10 percent. No non-native woody plants shall be present. This includes but is not limited to Giant Reed, Tamarisk, African Sumac, Mexican Paloverde, Tree of Heaven, and Tree Tobacco.

Diversity: The three restoration areas will have at least 60% of the native species richness relative to the reference sites sampled. Species richness may also be expressed relative to a reference site chosen by Pima County.

Pima County shall deem the restoration project complete and release the developer from its obligations to this restoration site when the success criteria are reached or within five (5) years after the initial construction of the restoration project, whichever comes first. At that point Pima County shall assume the responsibility for the restoration site.

Weed Eradication - Pull Method
If you can easily get the roots out

For many plants, the best way to ensure the plant is killed and will not resprout is to remove the entire plant, including roots.

This is especially important when herbicides will not be used.

This technique can work well for annual plants, immature plants, or for small infestations.

Pulling is not as effective on plants with deep or easily broken roots. Pulling can be done by hand, or with the aid of trowels, hula hoes, trenching shovels, 'Weed Wrenches', root talons, mcleods, pulaskis, shovels, hand picks, soil knives, long pry bars, and many other tools.

The 'Weed Wrench' is a favored tool among experienced workers. It has a set of jaws that clamp tightly onto the stem, providing a strong lever action and allowing fairly large plants to be pulled from the ground.

Digging can cause considerable soil disturbance and soil disturbance invites weeds and invasives to take over.

We suggest minimizing soil disturbance as much as possible and visiting the site on a regular basis to remove new weeds.

No weed whipping allowed, for this may endanger existing natives.

Weed Eradication - Cut Method
If you can't easily get the roots out

For an infestation of any significant size, it is likely that the plants will need to be cut.

For some plants, cutting them off at or near ground level is the best way to kill them.

For others, cutting is just the first step in the removal effort.

Some plants resprout vigorously when cut, replacing one or a few stems with many that can quickly flower and set seed.

An advantage of cutting, over pulling, is that it avoids soil disturbance.

There are lots of different cutting tools that can be used, including pruners, pruning saws, loppers, machetes, chain saws, and bow saws.

Methods of preventing resprouting after cutting: grind the stump in place with a stump-grinding machine.

Cut deep, crisscross grooves in the surface of the stump with a chain saw.

Treat the cut-stump immediately with herbicide (see the 'herbicides' section).

Weed Eradication - Herbicides

Herbicide may be applied only by personnel with a valid pesticide applicator license from the Arizona Department of Agriculture. Herbicide should be applied carefully and it should include a dye. Restoration species should be shielded / avoided.

Foliar spray

Foliage to cover all leaves and usually applied with a backpack sprayer (use low pressure, drift retardants and spray shields to avoid drift). Tends to be ineffective on plants that have leaves with thick, waxy cuticles. Easier to use on small plants. Herbicide spray drift can cause damage to nontarget plants.

Hack and squirt, and stem injection

Herbicide Concentrate or herbicide-water mixtures applied into incisions spaced around woody stems made by an ax, hatchet, machete, brush ax or tree injector. Used on woody species with large, thick trunks.

Cut-stump

Herbicide concentrate or herbicide-watermixture applied immediately (within 3 minutes) to freshly cut-stumps (outer circumference) or stems (entire top surface) with a backpack sprayer, spray bottle, wick, paintbrush or sponge.

Tree Stake Removal

Remove tree stakes fairly early on after the tree is planted (usually within a year), otherwise the tree can become dependent on the stakes.

The sooner the stakes are removed, the less risk there is of damaging the tree and the sooner the tree will develop a strong trunk and a well-established root system. Stakes can usually be removed from trees after the first year. To determine if the tree is ready for stake removal, grasp the trunk and gently shake it to see if the root ball is loose. If it doesn't move, remove the stakes.

Another way to determine if the stakes are needed is to bend the tree and watch the soil surrounding the trunk. Do this gently. Bend the tree as if it were being blown by the wind, see if the soil moves around the trunk. A firmly rooted plant will not move the soil surrounding it or move it only slightly. If the soil moves excessively, replace the stake making sure the stake is driven deeply in the soil so it will not move. Tie the tree to the stake as low on the trunk as possible so that the top of the plant can move while its roots remain motionless.

Disposal or Re-use of Wooden Tree Stakes

Once the tree stakes are removed the following is a list of disposal / re-use for the landscape contractor.

1. Habitat Shelter # 1: Arrange stakes (approximately 8 - 10) on the ground parallel to each other to form the first layer, with 4 - 6 inches of space between them to create tunnels for smaller animals.

For the second level, place stakes at right angles to the first, log-cabin style. Continue criss-crossing stakes to a height of 12 -15 inches. The pile doesn't have to be perfectly neat. Irregularity provides a matrix of internal spaces to shelter a variety of species.

2. Habitat Shelter # 2: Place one tree stake on the ground then place another at 45 degrees, criss-crossing one end. Keep staking the stakes in this arrangement to a height of 12 - 15 inches. The direction of the criss-crossed point should be pointed up stream.

3. Chipper Shredder - Mulching: The use of a chipper shredder to produce a mulch in place. Mulch can aid in soil stabilization, moisture retention, and soil insulation. Mulching conserves soil moisture by reducing the evaporation of water from the soil by wind and sun.

4. The landscape contractor may take possession of the stakes and re-use them on future projects.

5. The landscape contractor may dispose of tree stakes in a legal manner.

Irrigation Schedule

Irrigation for the restoration area is intended to be temporary. The plants are to be irrigated until the plant material is sustained by natural water sources.

The general irrigation schedule is to provide irrigation for the first two years, cutting back on the third year, and no irrigation the fourth and fifth year.

It is the resposibility of the landscape contractor to monitor and provide adequate water to these plants. The irrigation controller should be adjusted every quater (at minimum) for the appropiate season.

The restoration specialist and the landscape contractor shall evaluate the plant sustainablity per the scheduled inspections.

Plant Identification Sheets

All Year Round Control

All Year Round - Listed In order of removal priorty

Pennisetum ciliare - Buffelgrass
Pennisetum setaceum - Fountaingrass
Cynodon dactylon - Bermudagrass
Tamarix spp. - Salt cedar
Rhus lancea - African sumac
Parkinsonia aculeata - Mexican Palo Verde
Arundo donax - Giant reed
Nicotiana glauca - Tree tobacco
Bromus rubens - Red brome
Ailanthus altissima - Tree of heaven
Cortaderia selloana - Pampas grass

Buffelgrass

Pennisetum ciliare

High priority for control

Description

Plant Type: Warm season shrubby, perennial, bunchgrass that can spread by seed or root runners. Flowers and sets seed quickly after rainy periods.

Flower: Bristly flower heads 1 to 5 inches long, can be purple, grey, or yellowish turning a golden-brown color when dry. Flower heads can reproduce in as little as six weeks.

Leaves: Leaf blades are bluish-green in color, 3-12 inches long, with soft hairs on the upper surface. More brown to straw colored during dry periods.

Height: 6-36 inches tall and equally wide. It forms dense thickets and a dense root system that exclude natives.

Management

Preferred method of control:
Complete removal of the plant. All plant pieces; stems, crown, including roots, should be manually removed at the first sighting of small infestations. Plants need to be bagged and discarded from site.

Timing:
There is zero tolerence for this species. Removal must be year round. Hand pulling and a herbicide must be used on this plant. It can best be controlled when growing vigorously with herbicides such as glyphosate (Roundup / Kleenup).

Fountain grass

Pennisetum setaceum

High priority for control

Description

Plant Type: Perennial bunchgrass that appears lush in warm weather when moisture is present.

Flower: Purple to white inflorescenses are distinctively long and feathery. Can flower and set seed after rainy periods. Can seed several times a year.

Leaves: Long, slender, arching leaves are typically green in winter and may be brown in summer. Leaf coloration depends on water availability.

Height: Grows up to 3-4 feet tall.

Management

Preferred method of control:
Complete removal of the plant. All plant pieces; stems, crown, including roots, should be manually removed at the first sighting of small infestations. Plants need to be bagged and discarded from site.

Timing:
There is zero tolerence for this species. Removal must be year round. Hand pulling and a herbicide must be used on this plant. It can best be controlled when growing vigorously with herbicides such as glyphosate (Roundup / Kleenup).

Fountain grass

Pennisetum setaceum

Bermuda grass

Cynodon dactylon

High priority for control

Bermuda grass

Cynodon dactylon

Description

Plant Type: Warm season perennial grass that reproduces by stolons, rhizomes, and seeds. Creeps along the ground forming a dense mat.

Flower: The seed heads, 1 to 3 inches long, are arranged in a cluster of 3-7 spikes at the top of a reddish stem.

Leaves: Blades are smooth and pointed with a grey-green color.

Height: Usually 1-6 inches long

Management

Preferred method of control:
controlled by manual removal or herbicides. All plant parts, including roots, should be manually removed at the first sighting of small infestations.

Timing:
Control year round by manually removing, and applying herbicides when the plant is actively growing. Repeated herbicide applications will be necessary.

It can best be controlled when growing vigorously with herbicides such as glyphosate (Roundup / Kleenup).

Salt cedar

Tamarix spp.

High priority for control

Description

Plant Type: Deciduous, semi-evergreen shrub or tree with irregularly spreading-ascending, elongate branches.

Flower: Pink to white flower clusters (spikes) at the tips of the branches. Flowers from March to September.

Leaves: Blue-green leaves are tiny, scale-like, and excrete salt.

Height: 15-20 feet tall with equal spread.

Management

Preferred method of control:
Hand pulling is an effective strategy when small. A 'Weed Wrench' may be effective with larger plants. Remove entire root system and dicard from site.

Timing:
Remove year round.
The cut-stump application and a foliar spray of glyphosate will be necessary once individuals become established.

African sumac

Rhus lancea

High priority for control

Description

Plant Type: African sumac is a large evergreen tree / woody shrub. Propagates by seed and volunteers readily.

Flower: Small, inconspicuous, creamy whitish-green flowers.

Leaves: Leaves are palmately compound in groups of three, 2-4 inches long, shiny, and dark green.

Height: Single or multi-stemmed tree, 15-25 feet tall.

Management

Preferred method of control:
Hand pulling is an effective strategy when small. A 'Weed Wrench' may be effective with larger plants. Remove entire root system and dicard from site.

Timing:
Remove year round.
The cut-stump application and a foliar spray of glyphosate will be necessary once individuals become established.

Mexican Palo Verde

Parkinsonia aculeata

High priority for control

Description

Plant Type: Large evergreen, semi deciduous tree with smooth yellow-green bark with thorny twigs and branches. Volunteers readily.

Flower: Flowers are 1 inch wide and have 5 petals. The top petal is bright yellow.

Leaves: Leaves are green and bipinnately compound with 10 to 40 pairs of elliptical leaflets on 6 to 9 inch long, needle-like midribs.

Height: 15-20 feet tall with equal spread.

Management

Preferred method of control:
Hand pulling is an effective strategy when small. A 'Weed Wrench' may be effective with larger plants. Remove entire root system and dicard from site.

Timing: Remove year round.
The cut-stump application and a foliar spray of glyphosate will be necessary once individuals become established.

Mexican Palo Verde

Parkinsonia aculeata

Giant reed

Arundo donax

High priority for control

Description

Plant Type: Perennial grass, forms stands that resembles bamboo. Giant reed spreads primarily by rhizome fragments.

Flower: Plume-like inflorescence with pale brownish spikelets up to 2 feet long. Blooms spring to early fall.

Leaves: The green leaf blades are up to 3 feet long and 2-3 inches wide.

Height: Very tall (up to 15' to 20')

Management

Preferred method of control:
Hand-pulling is effective for plants less than 6½ feet tall, as long as all plant parts (especially rhizomes) are completely removed from site.

Timing:
Control year round with a combination of herbicide, (glyphosate) and cutting the plume at the time of flowering - (spring to fall).

All plant parts need to be bagged and discarded from site.

Tree tobacco

Nicotiana glauca

High priorty for control

Description

Plant Type: Annual, biennial, or sometimes a short-lived slender perennial shrub or small tree. Plant parts are considered poisonous.

Flower: Small yellow tubular flowers are 2 inches long by 1/2 inches wide at branch ends. Prolific seeder. Blooms April to August.

Leaves: Large, bluish grayish-green, oval to lance-shaped leaves are up to 7 inches long.

Height: Grows from 2 to18 feet high (typically one trunk).

Management

Preferred method of control:
Hand pullling and/or selective hoeing prior to flowering and seed set.

Timing:
During spring/summer it can be controlled by glyphosate based herbicides.

A 'Weed Wrench' or the cut-stump method maybe necessary for larger plants.

Red brome

Bromus rubens

High priority for control

Description

Red brome is a cool season annual, thrives in winter and spring and dies back in the heat of summer

Plant Type: Tufted annual bunchgrass.

Flower: brush-like inflorescences are green and become reddish-purple when mature.

Leaves: short, narrow, flat, with veins prominent on both surfaces.

Height: 4 to 20 inches tall.

Management

Preferred method of control:
Manual removal of plants through pulling and hoeing can be effective if done before seeds mature.
Can be controlled by herbicides such as glyphosate (Roundup / Kleenup) when small.
Plants need to be discarded from site.

Timing:
Begin control during late winter-early spring before seed set.

This is considered to be one of the most invasive plants in the Sonoran Desert.

Red brome

Bromus rubens

Tree of Heaven

Ailanthus altissima

Description

Plant Type: Rapidly growing upright deciduous tree with smooth light brown / gray bark becoming rough with dark ridges over time.

Flower: Nonshowy yellow green flowers; female trees develop large drooping clusters of reddish brown winged seed.

Leaves: Summer foliage is alternate, pinnately compound, 18" to 24" long, with dark green tropical-looking leaf. Herbaceous / woody stems have a rancid smell.

Height: Can easily reach 20 plus feet in a short period time.

Management

Preferred method of control:
Hand pulling is an effective strategy when small. A 'Weed Wrench' may be effective with larger plants. Remove entire root system and dicard from site.

Timing:
Remove year round.
The cut-stump application and a foliar spray of glyphosate will be necessary once individuals become established.

Tree of Heaven

Ailanthus altissima

Pampas grass

Cortaderia selloana

Description

Plant Type: Pampas grass is a shrubby, perennial, bunchgrass that can flower and set seed after rainy periods.

Flower: large pink-whitish plume like flowers.

Leaves: leaves are gray or bluish-green with narrowly tapering tips with saw-toothed edges (razor sharp), 1/2 inch to 1inch wide up to 10 feet long.

Height: can grow 8-12 feet tall.

Management

Preferred method of control:
Hand-pulling and herbicides are the best control options.
It can be controlled by herbicides such as 2,4-d or glyphosate (Roundup / Kleenup).

Timing:
Not yet problematic in Arizona.
Pampas grass is a species not yet in the area, but mangers should insure it does not become established.

Plant Identification Sheets

Late Winter / Early Spring Control

Late Winter - Listed In order of removal priorty

Salsola spp. - Russian thistle
Malva parviflora - Cheeseweed
Brassica tournefortii - Sahara mustard
Sisymbrium irio - London rocket
Sonchus oleraceus - Sowthistle
Erodium cicutarium - Filaree
Amaranthus palmeri - Pigweed - Careless weed

Russian thistle-Tumble Weed

Salsola spp.

High priority for control

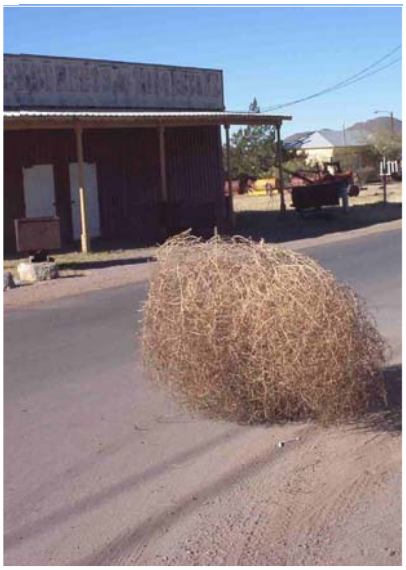
Description

Plant Type: A very bushy, branchy, spiny winter-spring annual broadleaf shrub. Grows into large, round bushes that will dry and then and tumble in the wind dispersing thousands of seeds.

Flower: Small pinkish to greenish-white, petal-less flowers.

Leaves: Leaves are narrow, alternate, and become stiff and spine-tipped in mature plants. Stems are often reddish.

Height: 3-36 inches tall, diameter often exceeds its height.



Management

Preferred method of control:
Hand-pulling / hoeing prior to flowering and seed set is the best method of control. Post seed-set, the entire plant must be removed from site.

It can be controlled by herbicides such as 2,4-d or glyphosate (Roundup / Kleenup) when small.

Timing:
Begin control during winter months.

Russian thistle-Tumble Weed

Salsola spp.

Cheeseweed

Malva parviflora

High priority for control

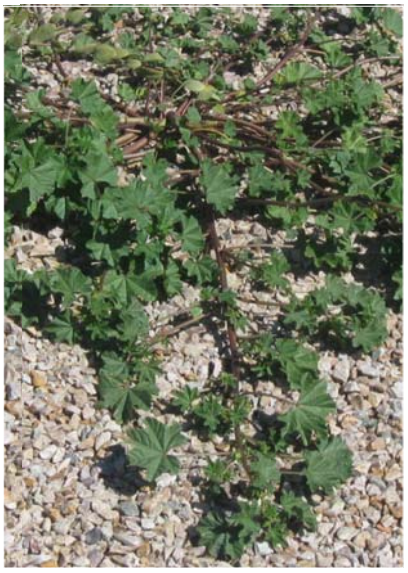
Description

Plant Type: An annual that occurs in cooler, wetter months.

Flower: Small, white to light pink petals of the flower are about a 1/5 inch long. Produces a green flatten button like seed.

Leaves: Leaves are dark green, 5 to 7 rounded lobes / wavy margins,up to two and a half inches wide with crinkled appearance.

Height: 2-3 feet tall



Management

Preferred method of control: Hand-pulling / hoeing prior to flowering and seed set is the best method of control.

Selective herbicides such as 2,4-d provide limited control. Glyphosate is ineffective in controlling this plant.

Timing: Manual control is best when plants are young. Begin control during winter months.

Sahara mustard

Brassica tournefortii

Description

Plant Type: Late winter / spring-blooming annual, forming rosettes generally 6-12 inches in diameter.

Flower: Light yellow,1/4 inch wide flowers have 4 petals and are followed by 2 inch long seedpods.

Leaves: The leaves are green, pinnately lobed, have toothed margins, and are mainly in a basal rosette. Leaves smell of cabbage or turnips when crushed.

Height: Up to 3 feet tall.

Management

Preferred method of control:
Selective hoeing prior to flowering and seed set. It can be controlled by herbicides such as glyphosate or triclopyr. Mature plants must be hand pulled and removed from site.

Timing:
Begin control during winter months. Blooms from January to April.

Sahara mustard

Brassica tournefortii

London rocket

Sisymbrium irio

Description

Plant Type: Cool season annual, thrives in winter-spring and dies back in the heat of summer. Thrives in disturbed sites with poor soil.

Flower: Flowers are small with four pale yellow petals that occur in a cluster on top of long green stem. Has 2" long, slender, seed pods. Blooms from December to May.

Leaves: Leaves are green, triangular, mainly basal, and pinnately lobed.

Height: Grows up to 3 feet.

Management

Preferred method of control:
Selective hoeing prior to flowering and seed set. It can be controlled by herbicides such as glyphosate (Roundup). Post seed-set, the entire plant must be removed from site.

Timing:
Begin control during winter months. Blooms from December to May.

Sow thistle

Sonchus oleraceus

Description

Plant Type: Cool season herbaceous annual, thrives in winter and spring and dies back in the heat of summer. Thrives in disturbed sites with poor soil.

Flower: Dandelion-like flower heads are followed by fuzzy, puffy, white ball shaped seedhead.

Leaves: Large leaves are alternate. Each leaf is stiff, shiny, toothed and sometimes pinnately lobed with a triangular tip.

Height: Grows up to 3-5 feet.

Management

Preferred method of control:
Selective hoeing prior to flowering and seed set. It can be controlled by herbicides such as glyphosate (Roundup).

Timing:
Begin control during winter months. Blooms from January to April.

Filaree

Erodium cicutarium

Description

Plant Type: Prostrate cool season (early spring) annual that develops as a flat rosette with fern-like leaves.

Flower: Flowers clusters occur on a umbrella-like flower stalk. Flowers are 1/2 inch wide with 5 bright pink to purple petals. Flowers February to May. Seeds can survive 1 to 3 years in soil.

Leaves: Individual leaflets are divided and arranged oppositely from one another. Leaflets are deeply lobed, and range from 1 to 8 inches long.

Height: Flowering stems grow out from rosettes and may reach up to 12 inches tall.

Management

Preferred method of control:
Selective hoeing prior to flowering and seed set or by chemical means.

Timing:
Herbicides may be applied in the late winter when plants are actively growing.

It can be controlled by herbicides such as glyphosate (Roundup).

Filaree

Erodium cicutarium

Carelessweed-Pigweed

Amaranthus palmeri

Description

Plant Type: Cool season annual.

Flower: Long, slender, flower inflorescences spikes, with reddish-green stems.

Leaves: Green lanceolate / egg-shaped.

Height: 3-6 feet tall.

Management

Preferred method of control:
Hand-pulling / hoeing prior to flowering and seed set is the best method of control.

It can be controlled by herbicides such as glyphosate (Roundup / Kleenup) when small.

Timing:
Begin control during winter months.

Plant Identification Sheets

Late Spring / Early Summer Control

Late Spring / Summer - Listed In order of removal priorty

Sorgum halepense - Johnson grass
Centaurea melitensis - Maltese star thistle
Eragrostis Lehmanniana - Lehman's lovegrass

Johnson grass

Sorghum halepense

High priority for control

Description

Plant Type: Very aggressive, tall, coarse, warm season perennial grass with stout rhizomes.

Flower: Large, loosely branched, purplish, hairy panicles. Spikelets occur in pairs or threes and each has a conspicuous awn. Produces an abundance of reddish-brown seed.

Leaves: Leaves are smooth, 2 feet long, 1 inch wide, and have a white midvein; pubescent on the upper surface. Stems are pink to rusty red near the base.

Height: Grows in dense clumps or nearly solid stands and can reach 6-8 feet in height.

Management

Preferred method of control:
Complete removal of the plant. All plant pieces; stems, crown, including roots, should be manually removed at the first sighting of small infestations. Plants need to be bagged and discarded from site. Very difficult to eradicate once established.

Timing:
There is zero tolerance for this species. Removal must be year round. Hand pulling and a herbicide (glyphosate) must be used on this plant. Repeat applications will be necessary.

Johnson grass

Sorgum halepense

Maltese star thistle

Centaurea melitensis

Description

Plant Type: Erect winter bushy annual.

Flower: Bright yellow 1/2 inch wide flowers are surrounded by 'cob-webby' bracts. Thistle-like flower heads have distinctive sharp spines. Blooms primarily in late spring early summer.

Leaves: Grayish-green foliage, form a basal rosette and are deeply lobed, approximately 6 inches long.

Height: Grows up to 3' tall.

Management

Preferred method of control:
Spot eradication (manual removal) is effective for small infestations. Mature plants must be hand pulled and removed from site.

It can be controlled by herbicides such as 2,4-D or glyphosate

Timing:
Control in spring. Flowers will produce viable seeds in eight days, therefore eradication of the plants before flowering will prevent seed production.

Maltese star thistle

Centaurea melitensis

Lehman's lovegrass

Eragrostis lehmanniana

High priority for control

Description

Plant Type: Warm-season, perennial bunchgrass.

Flower: Stems often have elbow-like bends with soft feathery inflorescences borne on numerous seed stalks. The pedicel (the stalk to which each seed is attached) is generally shorter than the length of the seed. Open, spreading; 3 to 6 inches long, each of the branches tipped with a small gray seedhead.

Leaves: Short, curved leaves, which are about 1/16 inch wide and 2 to 6 inches long, somewhat stiff.

Height: Grows up to 20-24 inches tall.

Management

Preferred method of control:
Control strategies include hand-pulling for small infestations and /or hoeing for larger stands.

Timing:
In spring It can be controlled by contact herbicides such as glyphosate (Roundup / Kleenup). Applications should be done in its early life cycle for best results.