

**DATE:** January 30, 2018

**TO:** Chris Cawein, Director  
Natural Resources, Parks and Recreation

**FROM:** Marisa Rice, Manager  
Open Space Lands  
  
Jessie Byrd, Manager  
Native Plant Nursery

**SUBJECT: Proposed Canoa Hills Golf Course Donation – Response to Item 12**

On December 12, 2017, you asked us to address Item 12 in Mr. Huckelberry’s memorandum dated December 7, 2017 (Exhibit A). Item 12 requests an assessment of the existing vegetation and provide restoration objectives for the proposed Canoa Hills Golf Course donation. We visited the Canoa Hills Golf Course on December 21, 2017 to evaluate existing conditions and assess for restoration opportunities. The following is a summary of our findings.

#### **EXISTING CONDITIONS**

##### Available GIS Data

Ephemeral washes upstream of the golf course are mapped Xeroriparian C habitat, while the golf course, developed prior to the mapping, contains no mapped habitat. The Harris Riparian classification is 143.1, Semidesert Grassland, or sometimes referred to as desert grassland, mesquite grassland, or scrub grassland. The Arizona Grasslands and The Nature Conservancy Grasslands layers classify this area as historic grassland with shrub cover greater than 35%. Canoa Hills is not part of the Conservation Lands System. Undisturbed vegetation upstream of the golf course is classified by the SWReGAP digital land cover layer as Sonoran Paloverde-Mixed Cacti Desert Scrub.

##### Existing Site Conditions

The golf course was constructed in historic ephemeral washes, generally taking advantage of the site’s natural topography, although grading occurred to accommodate the golf course design. Improvements include the excavation of several ponds that create topographically low points and berms at several locations that constrict and divert the floodplain and create areas of ponding.

Vegetation communities outside of the constructed course were mostly preserved in place (see Photos 1 and 2) and contain large remnant patches of native vegetation that support a diverse array of species (Table 1 – Existing Plant List). Generally, these areas are topographically higher than the golf course and would provide a local source of native seed over time.



Photo 1. Sonoran Desert Scrub plant community preserved in place.



Photo 2. Semidesert Grassland plant community preserved in place.

While there is an abundant seed source nearby, staff observed minimal recruitment of native perennial plants on the golf course with the exception of a small patch of Cholla cactus and mesquite trees (photos 3 and 4), although it is very likely the mesquite trees are hybridized.



Photo 3. Cholla Cactus Recruitment



Photo 4. Mesquite Tree Recruitment

Staff observed several locations along the path where non-native species have been intentionally planted including the non-native invasive Fountaingrass (Photo 5). We also found patches of various annual and perennial non-native invasive species throughout the site, either along the edge of the golf course or within the preserved in place plant communities (Table 1). The bulk of the perimeter edge of the golf course is residential landscape. Proximity to these residential landscapes could lead to a potential source of seed both native and non-native.



Photo 5. Landscaped area containing Fountaingrass.

The upstream watershed is highly developed by Freeport-McMoRan's Sierrita Mine. Upstream of the golf course, drainages are truncated by the Sierrita Mine tailings, while downstream I-19 acts as a barrier with the exception of two box culvert crossings. The first is three 10' x 7' reinforced concrete box culverts located at the southern end of the course and the second is two 84" corrugated metal pipe culverts located at the northern boundary. There are several smaller culverts, but it is unknown whether they provide a connection east of I-19; the hydrology and hydraulic review will provide insight regarding existing infrastructure. During the inspection, we observed wildlife use of the site including signs of coyote, javelina, deer, raccoon, and various bird species.

The community frequently uses the old golf cart path. In the few hours spent onsite, we passed multiple people walking and biking with several commenting on how much they enjoy using the path.

The golf course contains mostly recently mowed annual vegetation that desiccated after the summer rainy season making it difficult to identify species and plant community structure. Based on the site's history, staff expected to find large patches of Bermudagrass, but was surprised to find very little throughout the site. Instead, we found large areas of Palmer's amaranth (*Amaranthus palmeri*) and native annual grasses. The site has been off irrigation for some years, possibly stressing the Bermudagrass and allowing for displacement by native annuals. Based on vegetation that was present, staff was able to identify five land cover classes (Figure 1):

1. Retired golf course converting to an annual native plant community with low species richness (54 acres; see Photos 6 and 7).
2. Native trees preserved in place with understory converting to an annual native plant community (12.6 acres; see Photo 8).

3. Native plant communities (Desert Scrub/Semidesert Grassland/Xeroriparian) preserved in place (56.2 acres; see Photos 1 and 2).
4. Former ponds (3.1 acres; see Photo 9).
5. Denuded areas including sand traps and tee boxes (4.1 acres; see Photo 10).

Land cover Class 1, retired golf course converting to an annual native plant community with low species richness. This class consists of large patches of either Palmer's amaranth, or annual native grasses, primarily needle grama (*Bouteloua aristidoides*) and sixweeks threeawn (*Aristida adscensionis*), which are typically the first species to colonize a disturbed area. An occasional subshrub or forb/herb was observed, but these areas appear mostly homogenous including just a few species.



Photo 6. Retired golf course converting to annual native grasses.



Photo 7. Retired golf course converting to Palmer's Amaranth

Land cover Class 2, native trees preserved in place with understory in the process of converting to an annual native plant community. This class contains primarily mature velvet mesquite (*Prosopis velutina*) trees with an understory of either Palmer's amaranth or annual native grasses. The understory plant community is similar to Class 1 with a slightly higher plant species richness that includes perennial shrubs. The increased species richness is likely due to tree shading, cycling of nutrients and possibly reduced disturbance.



Photo 8. Land cover Class 2; native trees preserved in place with native understory.

Land cover Class 3, Native plant communities preserved in place. Varying topography throughout the site supports three separate plant communities including Sonoran Desertscrub, Semidesert grassland, and Xeroriparian habitat. The Sonoran Desertscrub is located on the hilltops and slopes (Photo 1), Semidesert grassland (Photo 2) is between the base of slopes and floodplain/riparian areas, and Xeroriparian habitat (Photo 9) is along the wash corridors and areas of ponding. These remnant habitat fragments provide resources for native animals, birds and insects. Native plant communities that have been preserved in place could provide a seed source for plant recruitment or for collection and growth at the Native Plant Nursery.



Photo 9. Example of a Xeroriparian habitat preserved in place.

Land cover Class 4, former ponds. The former ponds are low depressions on the landscape that collect water during storm events and support vegetation that tolerates periodic inundation. Vegetation in the ponds consists mostly of non-native invasive species such as Bermuda grass and tamarisk, and the weedy native Palmer's amaranth. Also present was the native perennial Desertbroom (*Baccharis sarothroides*), a common pioneer species on disturbed soils. We did observe one partially dead Gooding's willow tree, a remnant from when the ponds held water. At two of the ponds, we observed a torn and exposed liner, which may indicate the ponds no longer hold water for extended periods.



Photo 10. Example of land cover Class 4; area was former pond.

Land cover Class 5, denuded areas including sand traps and tee boxes. There was very little vegetation growing in these areas, possibly due to a soil fertility issue from lack of organic matter present. These areas contained coarse sand and it is possible the soil was compacted when originally constructed.



Photo 11. Land cover Class 5, Sand Trap

### **RESTORATION OPPORTUNITIES**

While the disturbed areas contained low species richness, it was promising to find native plants have successfully re-established on their own. Land cover Class 5, sand traps and tee boxes, contained very little vegetation, which may be due to a soil fertility issue. Staff recommends testing soil fertility prior to undertaking restoration efforts. We also observed several areas of active erosion, primarily headcuts along drainage swales (Photo 12).



Photo 12. Headcut with Active Erosion

Staff identified the following restoration objectives:

1. Map and remove non-native invasive species. Methods to remove invasive species may include mechanical, chemical or biological. Staff recommends solarization to treat the few patches of Bermuda grass.
2. Identify soil fertility problems and improve problem areas with soil amendments. The highly disturbed nature of golf courses from long-term management actions such as excessive irrigation, soil amendments, etc., may have modified native soils by increasing soil salinity, leaching out soil minerals, or other adverse effects. As such, staff recommends soil fertility testing prior to undertaking restoration and amending problem areas, if needed.
3. Modify ground topography to slow and infiltrate stormwater. An example would be to cut a sinuous channel in the drainage area to convey water through the site.
4. Use natural channel design techniques (one-rock dams, media lunas, and rock rundowns) to slow and infiltrate stormwater and mitigate erosion.
5. Increase species richness by planting native plants using both container plants and seed mix. Staff recommends a plant palette (Tables 2 and 3) modified from the Canoa Ranch restoration project plant list. Additional actions to help achieve this goal include reducing the amount of Palmer's amaranth during the active growing season using chemical and/or mechanical means and considering the site's topographic variability when installing container plants to locate in areas where they will most likely succeed.

The regeneration of native plants since the golf course closed shows potential for restoration, which could be accomplished using relatively low-tech, low-cost solutions allowing the site to demonstrate how a disturbed land can recover some of the Sonoran Desert ecosystem functions. Strategies for reducing restoration costs could include Pima County working with the Green Valley community to form a “land stewardship” volunteer group to assist with restoration objectives. Work may include mapping and removing invasive species, helping to build simple rock structures to mitigate erosion in partnership with non-profit groups, and/or helping to plant trees and apply seed mix.

MR/JB/tj

Attachments

c: Suzanne Shields, P.E., Director – Regional Flood Control District  
Eric Shepp, P.E., Deputy Director – Regional Flood Control District  
Colby Fryar, P.E., Civil Engineering Manager – Regional Flood Control District  
Julia Fonseca, Environmental Planning Manager – Sustainability and Conservation

# FIGURES

# Figure 1. Canoa Hills Golf Course Donation - Land Cover



**Table 1. Canoa Hills Golf Course Donation - Plants Observed 12/21/2017**

Scientific Name	Common Name	Primary Growth Habit	Nativity	Duration
Abutilon sp.	mallow	Forb/Herb	Native	Perennial
Acacia constricta	whitethorn acacia	Tree	Native	Perennial
Acacia greggii	catclaw acacia	Tree	Native	Perennial
Acourtia nana	dwarf desertpeony	Forb/Herb	Native	Perennial
Allionia incarnata	trailing windmills	Forb/Herb	Native	Annual, Perennial
Aloysia wrightii	Wright's beebrush	Shrub	Native	Perennial
Ambrosia confertiflora	weakleaf burr ragweed	Forb/Herb	Native	Perennial
Aristida adscensionis	sixweeks threeawn	Graminoid	Native	Annual
Aristida purpurea	purple threeawn	Graminoid	Native	Annual, Perennial
Aristida ternipes	spidergrass	Graminoid	Native	Perennial
Atriplex canescens	fourwing saltbush	Shrub	Native	Perennial
Baccharis sarothroides	desertbroom	Shrub	Native	Perennial
Bahia absinthifolia	hairyseed bahia	Forb/Herb	Native	Perennial
Boerhavia scandens	climbing wartclub	Vine	Native	Perennial
Boerhavia sp.	spiderling	Forb/Herb	Native	Annual
Bouteloua aristidoides	needle grama	Graminoid	Native	Annual
Brickellia sp.	brickellbush	Subshrub	Native	Perennial
Calliandra eriophylla	fairyduster	Shrub	Native	Perennial
Carnegiea gigantea	saguaro	Succulent	Native	Perennial
Celtis ehrenbergiana	spiny hackberry	Shrub	Native	Perennial
Chloris virgata	feather fingergrass	Graminoid	Native	Annual
Cocculus diversifolius	snailseed	Vine	Native	Perennial
Cylindropuntia arbuscula	Arizona pencil cholla	Succulent	Native	Perennial
Cylindropuntia fulgida	jumping cholla	Succulent	Native	Perennial
Cylindropuntia spinosior	walkingstick cactus	Succulent	Native	Perennial
Cylindropuntia versicolor	staghorn cholla	Succulent	Native	Perennial
Dasyochloa pulchella	low woollygrass	Graminoid	Native	Perennial
Datura wrightii	sacred thorn-apple	Forb/Herb	Native	Annual, Perennial
Echinocereus engelmannii	Engelmann's hedgehog cactus	Succulent	Native	Perennial
Encelia farinosa	goldenhills	Subshrub	Native	Perennial
Ephedra trifurca	longleaf jointfir	Shrub	Native	Perennial
Ericameria laricifolia	turpentine bush	Subshrub	Native	Perennial
Ferocactus wislizeni	candy barrelcactus	Succulent	Native	Perennial
Fouquieria splendens	ocotillo	Shrub	Native	Perennial
Gutierrezia sp.	snakeweed	Subshrub	Native	Perennial
Ipomoea sp.	morning-glory	Forb/Herb	Native	Annual
Isocoma tenuisecta	burweed	Subshrub	Native	Perennial
Justicia candicans	Arizona water-willow	Shrub	Native	Perennial
Muhlenbergia porteri	bush muhly	Graminoid	Native	Perennial
Opuntia engelmannii	cactus apple	Succulent	Native	Perennial
Opuntia phaeacantha	tulip pricklypear	Succulent	Native	Perennial
Opuntia santa-rita	Santa Rita pricklypear	Succulent	Native	Perennial
Pappophorum vaginatum	whiplash pappusgrass	Graminoid	Native	Perennial
Parkinsonia florida	blue paloverde	Tree	Native	Perennial
Phoradendron californicum	mesquite mistletoe	Subshrub	Native	Perennial
Physalis sp.	groundcherry	Forb/Herb	Native	Annual, Perennial
Prosopis velutina	velvet mesquite	Tree	Native	Perennial
Salix gooddingii	Goodding's willow	Tree	Native	Perennial
Sapindus saponaria	wingleaf soapberry	Tree	Native	Perennial
Setaria leucopila	streambed bristlegrass	Graminoid	Native	Perennial
Setaria macrostachya	large-spike bristlegrass	Graminoid	Native	Perennial
Simmondsia chinensis	jojoba	Shrub	Native	Perennial
Solanum elaeagnifolium	silverleaf nightshade	Subshrub	Native	Perennial
Stephanomeria pauciflora	brownplume wirelettuce	Subshrub	Native	Perennial
Verbesina encelioides	golden crownbeard	Forb/Herb	Native	Annual
Yucca elata	soaptree yucca	Tree	Native	Perennial
Zinnia acerosa	desert zinnia	Subshrub	Native	Perennial
Ziziphus obtusifolia	lotebush	Shrub	Native	Perennial
Acacia farnesiana	sweet acacia	Tree	Non-Native	Perennial
Agave americana	American century plant	Succulent	Non-Native	Perennial
Caesalpinia pulcherrima	bird of paradise	Shrub	Non-Native	Perennial
Eragrostis echinochloidea	African lovegrass	Graminoid	Non-Native	Perennial
Eucalyptus sp.	Eucalyptus	Tree	Non-Native	Perennial
Leucophyllum frutescens	Texas ranger	Shrub	Non-Native	Perennial

<b>Scientific Name</b>	<b>Common Name</b>	<b>Primary Growth Habit</b>	<b>Nativity</b>	<b>Duration</b>
Nerium oleander	oleander	Tree	Non-Native	Perennial
Opuntia engelmannii var. linguiformis	cactus apple	Succulent	Non-Native	Perennial
Panicum antidotale	blue panicum	Graminoid	Non-Native	Perennial
Parkinsonia aculeata	Jerusalem thorn	Tree	Non-Native	Perennial
Pennisetum ciliare	buffelgrass	Graminoid	Non-Native	Perennial
Pennisetum setaceum	crimson fountaingrass	Graminoid	Non-Native	Perennial
Prosopis sp.	non-native mesquite	Tree	Non-Native	Perennial
Rhus lancea	African sumac	Tree	Non-Native	Perennial
Salsola tragus	prickly Russian thistle	Forb/Herb	Non-Native	Annual
Schinus molle	Peruvian peppertree	Tree	Non-Native	Perennial
Tamarix sp.	tamarisk	Tree	Non-Native	Perennial

**Table 2. Canoa Hills - Container Plant List**

	<b>Scientific Name</b>	<b>Common Name</b>
<b>Trees:</b>	<i>Acacia constricta</i>	Whitethorn acacia
	<i>Acacia greggii</i>	Catclaw acacia
	<i>Cercidium floridum</i>	Blue Paloverde
	<i>Chilopsis linearis</i>	Desert Willow
	<i>Parkinsonia florida</i>	Blue Paloverde
	<i>Prosopis velutina</i>	Velvet Mesquite
<b>Shrubs:</b>	<i>Aloysia wrightii</i>	Wright's beebrush
	<i>Anisacanthus thurberi</i>	Desert honeysuckle
	<i>Atriplex canescens</i>	Fourwing saltbush
	<i>Calliandra eriophylla</i>	Fairyduster
	<i>Celtis pallida</i>	Desert hackberry
	<i>Condalia warnockii</i>	Kearney's snakewood
	<i>Cylindropuntia arbuscula</i>	Arizona pencil cholla
	<i>Cylindropuntia fulgida</i>	Chain-fruit cholla
	<i>Cylindropuntia leptocaulis</i>	Christmas cactus
	<i>Cylindropuntia spinosior</i>	Cane cholla
	<i>Ferocactus wislizenii</i>	Candy barrel cactus
	<i>Fouquieria splendens</i>	Ocotillo
	<i>Gossypium thurberi</i>	Thurber's cotton
	<i>Lycium andersonii</i>	Anderson Wolfberry
	<i>Lycium exsertum</i>	Thornbush
	<i>Lycium fremontii</i>	Fremont Wolfberry
	<i>Opuntia engelmannii</i>	Prickley pear
	<i>Rhus aromatica var. trilobata</i>	Three-leafed sumac
	<i>Yucca elata</i>	Soaptree yucca
	<i>Zizyphus obtusifolia</i>	Graythorn
<b>Subshrubs:</b>	<i>Bebbia juncea</i>	sweetbush
	<i>Brickellia californica</i>	California brickellbush
	<i>Encelia farinosa</i>	Brittlebush
	<i>Isocoma tenuisecta</i>	Burroweed
	<i>Psilostrophe cooperi</i>	Whitestem paperflower
	<i>Senna covesii</i>	Desert senna
	<i>Trixis californica</i>	American threefold
	<i>Zinnia acerosa</i>	Desert Zinnia
	<i>Acacia angustissima</i>	Prairie acacia
	<i>Ambrosia deltoidea</i>	Triangleleaf bursage
<b>Forbs:</b>	<i>Abutilon sp.</i>	Mallow
	<i>Asclepias linaria</i>	Pine-leaf milkweed
	<i>Asclepias subulata</i>	Desert milkweed
	<i>Bahia absinthifolia</i>	Dealbata's bahia
	<i>Commicarpus scandens</i>	Climbing wartclub

	Scientific Name	Common Name
	<i>Datura wrightii</i>	Sacred datura
	<i>Dicliptera resupinata</i>	Arizona foldwing
	<i>Proboscidea althaeifolia</i>	Devil's claw
	<i>Ruellia nudiflora</i>	Violet wild petunia
	<i>Senna hirsuta</i>	Slimpod senna
	<i>Sphaeralcea ambigua</i>	Desert globemallow
	<i>Sphaeralcea laxa</i>	Caliche globemallow
<b>Grasses:</b>	<i>Aristida purpurea</i>	Purple three-awn
	<i>Aristida ternipes</i>	Spidergrass
	<i>Bothriochloa barbinoides</i>	Cane beardgrass
	<i>Bouteloua curtipendula</i>	Sideoats grama
	<i>Digitaria californica</i>	Arizona cottontop
	<i>Heteropogon contortus</i>	Tanglehead
	<i>Leptochloa dubia</i>	Green Sprangletop
	<i>Muhlenbergia porteri</i>	Bush muhly
	<i>Pappophorum vaginatum</i>	Spike Pappusgrass
	<i>Setaria leucopila</i>	Streambed bristlegrass
	<i>Setaria macrostachya</i>	Plains bristlegrass
	<i>Sporobolus contractus</i>	Spike dropseed
	<i>Sporobolus cryptandrus</i>	Sand dropseed
	<i>Sporobolus wrightii</i>	Big Alkali Sacaton
	<i>Trichloris crinita</i>	False Rhodesgrass
<b>Vines:</b>	<i>Aristolochia watsonii</i>	Watson's dutchman's pipevine
	<i>Clematis drummondii</i>	Virgin's bower
	<i>Cottsia gracilis</i>	Slender janusia
	<i>Cucurbita digitata</i>	Fingerleaf gourd
	<i>Funastrum cynanchoides</i>	Climbing milkweed
	<i>Marah gilensis</i>	Gila manroot
	<i>Maurandya antirrhiniflora</i>	Roving sailor
	<i>Passiflora mexicana</i>	Mexican passionflower

**Table 3. Canoa Hills - Seed Mix Plant List**

	<b>Scientific Name</b>	<b>Common Name</b>	<b>Duration</b>
<b>Shrubs:</b>	<i>Atriplex canescens</i>	Fourwing saltbush	Perennial
	<i>Larrea tridentata</i>	Creosote bush	Perennial
<b>Subshrubs:</b>	<i>Atriplex elegans</i>	Wheelscale saltbush	Summer Annual
	<i>Atriplex polycarpa</i>	Allscale saltbush	Summer Annual
	<i>Atriplex wrightii</i>	Wright's saltbush	Summer Annual
	<i>Calliandra eriophylla</i>	Fairyduster	Perennial
	<i>Gutierrezia microcephala</i>	Threadleaf snakeweed	Perennial
	<i>Isocoma tenuisecta</i>	Burroweed	Perennial
	<i>Psilostrophe cooperi</i>	Whitestem paperflower	Perennial
	<i>Senna covesii</i>	Desert senna	Perennial
	<i>Trixis californica</i>	American threefold	Perennial
	<b>Forbs:</b>	<i>Allionia incarnata</i>	Trailing four-o'clock
<i>Astragalus arizonicus</i>		Arizona milkvetch	Perennial
<i>Ayenia filiformis</i>		Trans-Pecos ayenia	Perennial
<i>Bahia absinthifolia</i>		Dealbata's bahia	Perennial
<i>Baileya multiradiata</i>		Desert marigold	Annual
<i>Chamaesyce florida</i>		Chiricahua Mountain sandmat	Winter Annual
<i>Chamaesyce hyssopifolia</i>		Hyssopleaf sandmat	Annual/Perennial
<i>Croton pottsii</i>		Leatherweed	Perennial
<i>Datura wrightii</i>		Sacred datura	Annual/Perennial
<i>Dicliptera resupinata</i>		Arizona foldwing	Perennial
<i>Eriastrum diffusum</i>		Miniature woollystar	Winter Annual
<i>Erigeron divergens</i>		Spreading fleabane	Biennial
<i>Eschscholzia californica ssp. mexicana</i>		Mexican gold poppy	Winter Annual
<i>Euphorbia heterophylla</i>		Mexican fireplant	Annual/Perennial
<i>Evolvulus arizonicus</i>		Wild dwarf morning glory	Perennial
<i>Glandularia gooddingii</i>		Goodding's verbena	Perennial
<i>Heliomeris longifolia var. annua</i>		Longleaf false goldeneye	Summer Annual
<i>Ipomopsis longiflora</i>		flaxflowered ipomopsis	Winter Annual
<i>Kallstroemia grandiflora</i>		Arizona poppy	Summer Annual
<i>Lotus humistratus</i>		Foothill deervetch	Winter Annual
<i>Machaeranthera tanacetifolia</i>		Tansyleaf tansyaster	Summer Annual
<i>Mentzelia multiflora</i>		Desert blazing star	Perennial
<i>Oenothera primiveris</i>		Desert evening primrose	Winter Annual
<i>Pectis papposa</i>		Manybristle cinchweed	Summer Annual
<i>Penstemon parryi</i>		Desert penstemon	Perennial
<i>Phacelia arizonica</i>		Arizona phacelia	Winter Annual
<i>Phacelia bombycina</i>		Mangas Spring phacelia	Winter Annual
<i>Phacelia crenulata</i>		cleftleaf wildheliotrope	Winter Annual
<i>Phacelia distans</i>		Distant phacelia	Winter Annual
<i>Physalis pubescens</i>		Husk tomato	Summer Annual
<i>Physaria gordonii</i>	Gordon's bladderpod	Winter Annual	
<i>Plantago ovata</i>	Desert Indianwheat	Winter Annual	
<i>Plantago patagonica</i>	Woolly plantain	Winter Annual	

	Scientific Name	Common Name	Duration
	<i>Proboscidea althaeifolia</i>	Devil's claw	Perennial
	<i>Proboscidea parviflora</i>	Doubleclaw	Summer Annual
	<i>Rafinesquia neomexicana</i>	New Mexico plumeseed	Winter Annual
	<i>Salvia columbariae</i>	Desert chia	Winter Annual
	<i>Sphaeralcea angustifolia</i>	Copper globemallow	Perennial
	<i>Sphaeralcea emoryi</i>	Emory's globemallow	Perennial
<b>Grasses:</b>	<i>Aristida purpurea</i>	Purple threeawn	Perennial
	<i>Aristida ternipes</i>	Spidergrass	Perennial
	<i>Bouteloua barbata</i>	Sixweeks grama	Annual
	<i>Bouteloua curtipendula</i>	Sideoats grama	Perennial
	<i>Bouteloua rothrockii</i>	Rothrock's grama	Perennial
	<i>Chloris virgata</i>	Feather fingergrass	Annual
	<i>Dasyochloa pulchella</i>	Fluffgrass	Perennial
	<i>Eriochloa acuminata var. minor</i>	tapertip cupgrass	Annual
	<i>Heteropogon contortus</i>	Tanglehead	Perennial
	<i>Hilaria mutica</i>	tobosagrass	Perennial
	<i>Muhlenbergia microsperma</i>	Littleseed muhly	Annual
	<i>Muhlenbergia porteri</i>	Bush muhly	Perennial
	<i>Panicum capillare</i>	Witchgrass	Annual
	<i>Panicum obtusum</i>	Vine mesquite	Perennial
	<i>Setaria leucopila</i>	Streambed bristlegrass	Perennial
	<i>Setaria macrostachya</i>	Plains bristlegrass	Perennial
	<i>Urochloa arizonica</i>	Arizona signalgrass	Annual
	<i>Vulpia octoflora</i>	Sixweeks fescue	Annual
<b>Vines:</b>	<i>Clematis drummondii</i>	Virgin's bower	Perennial
	<i>Cottisia gracilis</i>	Slender janusia	Perennial
	<i>Cucurbita digitata</i>	Fingerleaf gourd	Perennial
	<i>Echinopepon wrightii</i>	Wild balsam apple	Summer Annual