USDA Natural Resources
Conservation Service

Ecological site R041XB211AZ
Saline Bottom 8-12" p.z.

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General information

Provisional. A provisional ecological site description has undergone quality control and quality assurance review. It contains a working state and transition model and enough information to identify the ecological site.

Figure 1. Mapped extent

Areas shown in blue indicate the maximum mapped extent of this ecological site. Other ecological sites likely occur within the highlighted areas. It is also possible for this ecological site to occur outside of highlighted areas if detailed soil survey has not been completed or recently updated.

MLRA notes

Major Land Resource Area (MLRA): 041X–Madrean Archipelago

AZ 41.2 – Chihuahuan – Sonoran Desert Shrubs

Elevations range from 2600 to 4000 feet and precipitation ranges from 8 to 12 inches per year. Vegetation includes mesquite, palo verde, catclaw acacia, soaptree yucca, creosotebush, whitethorn, staghorn cholla, desert saltbush, Mormon tea, burroweed, snakeweed, tobosa, black grama, threeawns, bush muhly, dropseed, and burrograss. The soil temperature regime is thermic and the soil moisture regime is typic aridic. This unit occurs within the Basin and Range Physiographic Province and is characterized by numerous mountain ranges that rise abruptly from broad, plain-like valleys and basins. Igneous and metamorphic rock classes dominate the mountain ranges and sediments filling the basins represent combinations of fluvial, lacustrine, colluvial and alluvial deposits.

Associated sites

R041XC312AZ	**Loamy Bottom 12-16" p.z.**
R041XC313AZ	**Loamy Upland 12"-16" p.z.**
R041XC319AZ	**Sandy Loam Upland 12-16" p.z.**

Similar sites

R041XB211AZ	**Saline Bottom 8-12" p.z.**

Table 1. Dominant plant species

Tree	Not specified
Shrub	(1) *atriplex obovata*
Herbaceous	(1) *sporobolus airoides*

Physiographic features

This site occurs in the lowest elevations of the Madrean Basin and Range province in southeastern Arizona. It occurs on alluvial fans flanking the Gila and San Simon Rivers. It benefits on a sporadic basis from extra moisture received as runoff from the contributory watershed areas.

Table 2. Representative physiographic features

Landforms	(1) Alluvial fan (2) Flood plain (3) Flood-plain playa
Flooding duration	Very brief (4 to 48 hours) to brief (2 to 7 days)
Flooding frequency	Occasional to frequent
Ponding duration	Very brief (4 to 48 hours) to brief (2 to 7 days)
Ponding frequency	Rare to occasional
Elevation	792–1,219 m
Slope	0–3%
Aspect	Aspect is not a significant factor

Climatic features

Precipitation ranges from 8-12 inches annually. More than half falls during Jul-Sep in brief, but often heavy, thunderstorms. The rest of the moisture comes as light rain or snow that falls slowly for a day or more, but rarely lasts more than a day. May and June are normally the driest months. Humidity is generally very low.

Temperatures are mild throughout most of the year. Freezing temperatures are common at night Dec-Feb; brief 0 F may be observed some nights. During June, July & August, some days may exceed 100 F.

In years of average or greater winter precipitation, annual grasses and forbs occur abundantly in the interspaces.

Table 3. Representative climatic features

Frost-free period (average)	240 days
Freeze-free period (average)	0 days
Precipitation total (average)	0 mm

Influencing water features

There are no water features on this site.

Soil features

These soils are of various depth and textures. They have all formed in strongly saline and/or alkaline, basin floor

alluvium. Plant-soil moisture relationships are fair to poor due to infrequent flooding.

Soils mapped on this site include: SSA-666 Cochise county Northwest part MU 50 Hantz; SSA-671 Cochise county Douglas-Tombstone part MU 85 Hantz SiL saline-sodic.

Table 4. Representative soil features

Surface texture	(1) Clay loam (2) Silty clay loam (3) Silty clay
Family particle size	(1) Clayey
Drainage class	Somewhat poorly drained to well drained
Permeability class	Moderately slow to very slow
Soil depth	152 cm
Surface fragment cover <=3"	0–5%
Surface fragment cover >3"	0–1%
Available water capacity (0-101.6cm)	9.14–15.24 cm
Calcium carbonate equivalent (0-101.6cm)	1–20%
Electrical conductivity (0-101.6cm)	4–20 mmhos/cm
Sodium adsorption ratio (0-101.6cm)	6–60
Soil reaction (1:1 water) (0-101.6cm)	7.4–8.4
Subsurface fragment volume <=3" (Depth not specified)	0–5%
Subsurface fragment volume >3" (Depth not specified)	0–1%

Ecological dynamics

The plant communities found on an ecological site are naturally variable. Composition and production will vary with yearly conditions, location, aspect, and the natural variability of the soils. The Historical Climax Plant Community represents the natural potential plant communities found on relict or relatively undisturbed sites. Other plant communities described here represent plant communities that are known to occur when the site is disturbed by factors such as fire, grazing, or drought.

Production data provided in this site description is standardized to air dry weight at the end of the summer growing season. The plant communities described in this site description are based on near normal rainfall years.

NRCS uses a Similarity Index to compare existing plant communities to the plant communities described here. Similarity index is determined by comparing the production and composition of a plant community to the production of a plant community described in this site description. To determine Similarity Index, compare the production (air dry weight) of each species to that shown in the plant community description. For each species, count no more than the maximum amount shown for the species, and for each group, count no more than the maximum amount shown for the group. Divide the resulting total by the total normal year production shown in the plant community description. If rainfall has been significantly above or below normal, use the total production shown for above or below normal years. If field data is not collected at the end of the summer growing season, then the field data must be corrected to the end of the year production before comparing it to the site description. The growth curve can be used as a guide for estimating production at the end of the summer growing season.

State and transition model

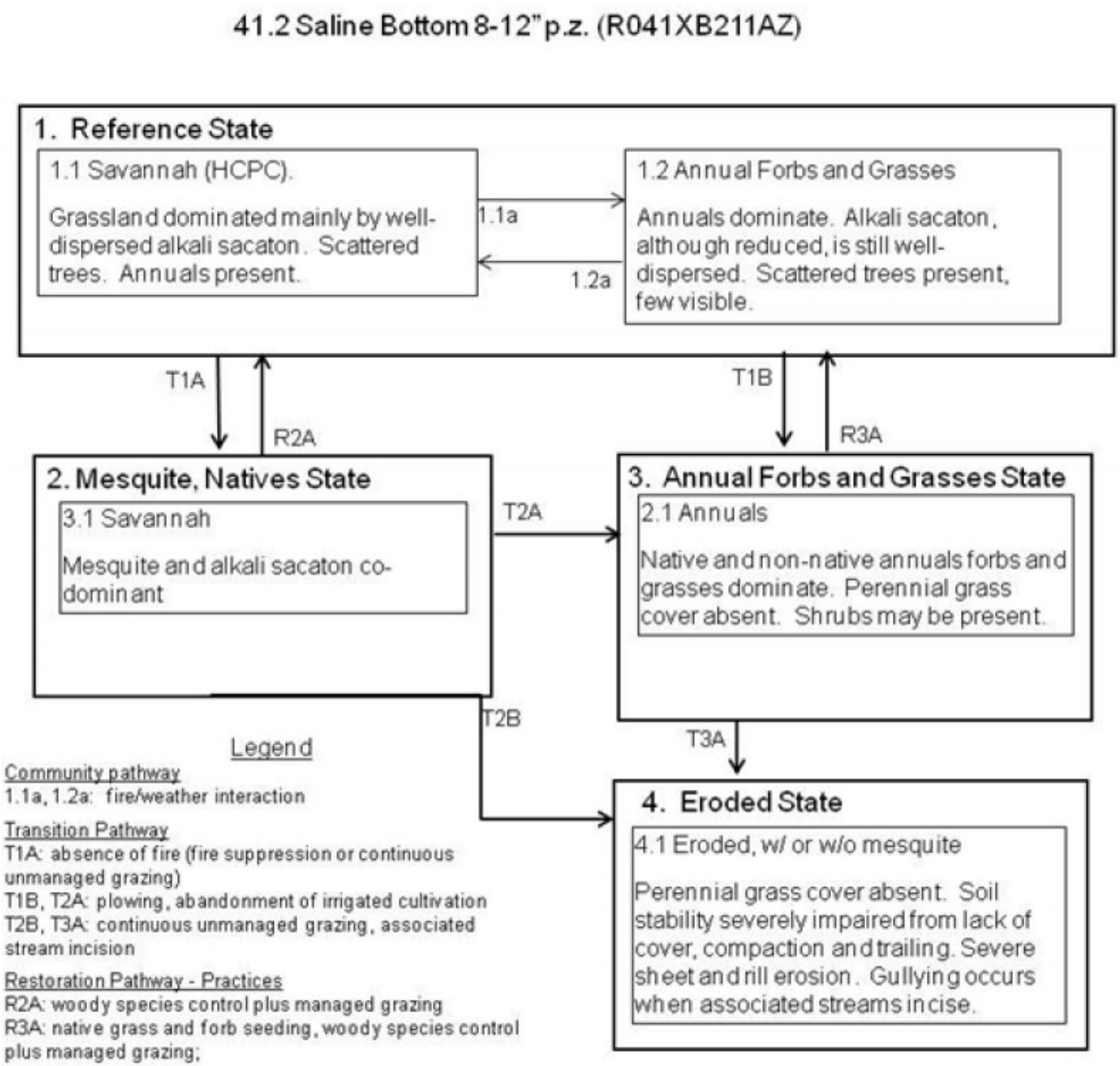

Figure 4. 41-2 Saline Bottom STM Diagram

State 1
Reference

Community 1.1
Savannah (HCPC)

The potential plant community is dominated by a warm perennial grass; alkalai sacaton. Scattered trees give the site a savannah appearance. Several species of shrubs and perennial and annual forbs are unique to this site. This site is not flooded on a regular basis. Production will vary from what rainfall can produce in one year, to several times that when the site floods in another year. In large areas of this site there will be places where water concentrates and larger areas where runoff occurs. Flooding in "El Nino" years will be widespread and of long duration. As the plant community deteriorates from continuous heavy grazing and/or repeated burning alkalai sacaton can decrease in cover. Mesquite can increase to densities of 20-30 percent canopy without a noticeable decline in grass under-story. Tree size varies with soil texture and depth. Areas of the site flanking the Willcox playa are not subject to gully erosion as base level is controlled by the closed drainage system. However, areas which flank stream floodplains are subject to severe gully erosion if the base level of the stream is lowered and the grass

cover is depleted by improper management. Natural fire was a feature of this and helped maintain the shrub free aspect of the potential plant community.

Table 5. Annual production by plant type

Plant Type	Low (Kg/Hectare)	Representative Value (Kg/Hectare)	High (Kg/Hectare)
Grass/Grasslike	455	1121	1961
Forb	7	34	140
Tree	6	11	112
Shrub/Vine	6	22	106
Total	**474**	**1188**	**2319**

Figure 6. Plant community growth curve (percent production by month). AZ4134, 41.3 12-16" p.z. other sites. Growth begins in the spring, semi-dormancy occurs during the May through June drought, most growth occurs during the summer rains..

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0	0	5	10	0	0	30	35	15	5	0	0

Community 1.2
Annual Forbs and Grasses

Pathway 1.1a
Community 1.1 to 1.2

Natural fire controls canopy growth of mesquite and whitethorn acacia. Annual forbs and grasses populate the exposed plant interspaces among alkali sacaton.

Conservation practices

Prescribed Burning
Upland Wildlife Habitat Management
Prescribed Grazing

Pathway 1.2a
Community 1.2 to 1.1

In the 10-20 year interval between natural fire events, alkali sacaton resumes dominance of plant community. Mesquite re-sprout after fire to return savannah aspect to landscape.

Conservation practices

Upland Wildlife Habitat Management
Prescribed Grazing

State 2
Mesquite, native grass

Community 2.1
Mesquite, native grass

Mesquite increases in the absence of fire for long periods of time. Alkalai sacaton can maintain good cover with up to 25% canopy of mesquite in occasionally flooded situations.

State 3
Annual grasses and forbs

Community 3.1
Annual grasses and forbs

This state occurs where the native plant community has been plowed and the site brought under cultivation (irrigated agriculture) and subsequently abandoned. Native and non-native annual forbs and grasses dominate the plant community. Shrubs like desert broom, jimmyweed and burroweed can be present.

State 4
Eroded, w/wo mesquite

Community 4.1
Eroded, w/wo mesquite

This state occurs where the site has been depleted of grass cover either due to cultivation or due to the interactions of fire, drought and continuous grazing. Base level changes of associated stream systems will cause gulling of the site in this condition. Areas of this state around the Willcox playa will not have gullies due to the base level control of the playa, but will have severe sheet and rill erosion due to lack of plant cover, soil compaction and trailing. This state can have moderate to high amounts of mesquite present. Erosion networks cause large amounts of water to be rapidly drained from the site.

Transition T1A
State 1 to 2

Long fire-free periods, fire suppression or due to grazing/consumption of fine fuel, allows mesquite unhindered growth.

Transition T1B
State 1 to 3

Conversion to and subsequent abdonment of irrigated cultivation.

Restoration pathway R2A
State 2 to 1

Returning fire to the ecosytem will not control mesquite in this State. Mechanical or chemical woody species management is needed. Grazing management and prescribed fire will maintain herbaceous community after brush control is applied.

Conservation practices

Brush Management
Prescribed Burning
Upland Wildlife Habitat Management
Prescribed Grazing

Transition T2A
State 2 to 3

Conversion to and subsequent abdonment of irrigated cultivation.

Transition T2B
State 2 to 4

Long-term unmanaged grazing affects soil site stability and hydrologic functioning. Animal trailing and soil surface compaction compound the affect of plant community changes (increased trees/decreased perennial grass community) to increase surface water run-off rather than infiltration.

Transition T3A
State 3 to 4

Long-term unmanaged grazing affects soil site stability and hydrologic functioning. Animal trailing and soil surface compaction compound the affect of plant community changes (increased shrub/decreased perennial grass community) to increase surface water run-off rather than infiltration.

Restoration pathway R3A
State 3 to 4

No restoration pathway known at this time. Perhaps development of enhanced native seeding techniques will occur.

Conservation practices

Brush Management
Mulching
Grazing Land Mechanical Treatment
Range Planting
Recreation Area Improvement
Recreation Land Grading and Shaping
Upland Wildlife Habitat Management
Prescribed Grazing
Road/Trail/Landing Closure and Treatment

Additional community tables

Table 6. Community 1.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production (Kg/Hectare)	Foliar Cover (%)
Grass/Grasslike					
1	**Dominant perennial grass**			448–1681	
	alkali sacaton	SPAI	*Sporobolus airoides*	448–1681	–
2	**Miscellaneous perennial grasses**			6–168	
	big sacaton	SPWR2	*Sporobolus wrightii*	0–84	–
	saltgrass	DISP	*Distichlis spicata*	1–56	–
	vine mesquite	PAOB	*Panicum obtusum*	0–34	–
	scratchgrass	MUAS	*Muhlenbergia asperifolia*	0–28	–
	creeping muhly	MURE	*Muhlenbergia repens*	0–28	–
	spidergrass	ARTE3	*Aristida ternipes*	0–17	–
	spidergrass	ARTEG	*Aristida ternipes var. gentilis*	0–17	–
	blue grama	BOGR2	*Bouteloua gracilis*	0–17	–
	tobosagrass	PLMU3	*Pleuraphis mutica*	0–17	–
	knotgrass	PADI6	*Paspalum distichum*	0–11	–
	hairy grama	BOHI2	*Bouteloua hirsuta*	0–11	–
	Rothrock's grama	BORO2	*Bouteloua rothrockii*	0–11	–

	sedge	CAREX	*Carex*	0–6	–
	flatsedge	CYPER	*Cyperus*	0–6	–
	Parish's threeawn	ARPUP5	*Aristida purpurea var. parishii*	0–6	–
	burrograss	SCBR2	*Scleropogon brevifolius*	0–6	–
	plains bristlegrass	SEVU2	*Setaria vulpiseta*	0–6	–
	spike dropseed	SPCO4	*Sporobolus contractus*	0–6	–
	sand dropseed	SPCR	*Sporobolus cryptandrus*	0–6	–
3	**Annual grasses**			1–112	
	feather fingergrass	CHVI4	*Chloris virgata*	1–28	–
	prairie threeawn	AROL	*Aristida oligantha*	1–28	–
	needle grama	BOAR	*Bouteloua aristidoides*	0–17	–
	tapertip cupgrass	ERACA	*Eriochloa acuminata var. acuminata*	0–17	–
	mucronate sprangletop	LEPA6	*Leptochloa panicea*	0–17	–
	sticky sprangletop	LEVI5	*Leptochloa viscida*	0–17	–
	Mexican sprangletop	LEFUU	*Leptochloa fusca ssp. uninervia*	0–11	–
	Arizona brome	BRAR4	*Bromus arizonicus*	0–6	–
	tufted lovegrass	ERPE	*Eragrostis pectinacea*	0–6	–
	little barley	HOPU	*Hordeum pusillum*	0–6	–
	sixweeks threeawn	ARAD	*Aristida adscensionis*	0–6	–
	delicate muhly	MUFR	*Muhlenbergia fragilis*	0–6	–
	littleseed muhly	MUMI	*Muhlenbergia microsperma*	0–6	–
	witchgrass	PACA6	*Panicum capillare*	0–6	–
	Mexican panicgrass	PAHI5	*Panicum hirticaule*	0–6	–
	Bigelow's bluegrass	POBI	*Poa bigelovii*	0–6	–
	poverty dropseed	SPVA	*Sporobolus vaginiflorus*	0–6	–
	Arizona signalgrass	URAR	*Urochloa arizonica*	0–6	–
	sixweeks fescue	VUOC	*Vulpia octoflora*	0–6	–
Forb					
4	**Perennial forbs**			6–56	
	fingerleaf gourd	CUDI	*Cucurbita digitata*	1–17	–
	Missouri gourd	CUFO	*Cucurbita foetidissima*	0–17	–
	weakleaf bur ragweed	AMCO3	*Ambrosia confertiflora*	1–17	–
	alkali marsh aster	ALPA14	*Almutaster pauciflorus*	0–6	–
	scarlet spiderling	BOCO	*Boerhavia coccinea*	0–6	–
	spiny chloracantha	CHSP11	*Chloracantha spinosa*	0–6	–
	coyote gourd	CUPA	*Cucurbita palmata*	0–6	–
	beeblossom	GAURA	*Gaura*	0–6	–
	southwestern mock vervain	GLGO	*Glandularia gooddingii*	0–6	–
	small matweed	GUDE	*Guilleminea densa*	0–6	–
	Indian rushpea	HOGL2	*Hoffmannseggia glauca*	0–6	–
	lacy tansyaster	MAPI	*Machaeranthera pinnatifida*	0–6	–
	camphor pluchea	PLCA7	*Pluchea camphorata*	0–6	–
	canaigre dock	RUHY	*Rumex hymenosepalus*	0–6	–

	earleaf fanpetals	SITR	*Sida tragiifolia*	0–6	–
	silverleaf nightshade	SOEL	*Solanum elaeagnifolium*	0–6	–
	silky sophora	SONU	*Sophora nuttalliana*	0–6	–
	gooseberryleaf globemallow	SPGR2	*Sphaeralcea grossulariifolia*	0–6	–
	spear globemallow	SPHA	*Sphaeralcea hastulata*	0–6	–
	dwarf desertpeony	ACNA2	*Acourtia nana*	0–2	–
	clasping milkweed	ASAM	*Asclepias amplexicaulis*	0–1	–
5	**Annual forbs**			1–84	
	common sunflower	HEAN3	*Helianthus annuus*	0–56	–
	common sunflower	HEAN3	*Helianthus annuus*	0–56	–
	San Pedro matchweed	XAGY	*Xanthocephalum gymnospermoides*	0–34	–
	Nuttall's povertyweed	MONU	*Monolepis nuttalliana*	0–34	–
	salt heliotrope	HECU3	*Heliotropium curassavicum*	0–28	–
	wheelscale saltbush	ATEL	*Atriplex elegans*	0–28	–
	carelessweed	AMPA	*Amaranthus palmeri*	0–28	–
	wheelscale saltbush	ATEL	*Atriplex elegans*	1–28	–
	Wright's saltbush	ATWR	*Atriplex wrightii*	0–28	–
	salt heliotrope	HECU3	*Heliotropium curassavicum*	0–28	–
	seaside heliotrope	HECUO	*Heliotropium curassavicum var. oculatum*	0–28	–
	western tansymustard	DEPI	*Descurainia pinnata*	1–28	–
	Nuttall's povertyweed	MONU	*Monolepis nuttalliana*	0–28	–
	San Pedro matchweed	XAGY	*Xanthocephalum gymnospermoides*	0–28	–
	intermediate pepperweed	LEVIM	*Lepidium virginicum var. medium*	0–17	–
	hairy desertsunflower	GECA2	*Geraea canescens*	0–17	–
	longleaf false goldeneye	HELOA2	*Heliomeris longifolia var. annua*	0–17	–
	longleaf false goldeneye	HELOL	*Heliomeris longifolia var. longifolia*	0–17	–
	camphorweed	HESU3	*Heterotheca subaxillaris*	0–17	–
	goosefoot	CHENO	*Chenopodium*	0–17	–
	Wright's saltbush	ATWR	*Atriplex wrightii*	0–17	–
	goosefoot	CHENO	*Chenopodium*	0–17	–
	carelessweed	AMPA	*Amaranthus palmeri*	0–17	–
	bristly fiddleneck	AMTE3	*Amsinckia tessellata*	0–17	–
	intermediate pepperweed	LEVIM	*Lepidium virginicum var. medium*	0–17	–
	western tansymustard	DEPI	*Descurainia pinnata*	0–17	–
	longleaf false goldeneye	HELOA2	*Heliomeris longifolia var. annua*	0–17	–
	hairy desertsunflower	GECA2	*Geraea canescens*	0–11	–
	slender goldenweed	MAGR10	*Machaeranthera gracilis*	0–11	–
	tanseyleaf tansyaster	MATA2	*Machaeranthera tanacetifolia*	0–11	–
	golden crownbeard	VEEN	*Verbesina encelioides*	0–11	–
	cryptantha	CRYPT	*Cryptantha*	0–11	–

	golden crownbeard	VEEN	*Verbesina encelioides*	0–11	–
	purslane	PORTU	*Portulaca*	0–6	–
	desert Indianwheat	PLOV	*Plantago ovata*	0–6	–
	shaggyfruit pepperweed	LELA	*Lepidium lasiocarpum*	0–6	–
	sleepy silene	SIAN2	*Silene antirrhina*	0–6	–
	crestrib morning-glory	IPCO2	*Ipomoea costellata*	0–6	–
	Thurber's morning-glory	IPTH	*Ipomoea thurberi*	0–6	–
	spurge	EUPHO	*Euphorbia*	0–6	–
	slender goldenweed	MAGR10	*Machaeranthera gracilis*	0–6	–
	tanseyleaf tansyaster	MATA2	*Machaeranthera tanacetifolia*	0–6	–
	New Mexico thistle	CINE	*Cirsium neomexicanum*	0–6	–
	fewflower beggarticks	BILE	*Bidens leptocephala*	0–6	–
	Coulter's spiderling	BOCO2	*Boerhavia coulteri*	0–6	–
	crested anoda	ANCR2	*Anoda cristata*	0–6	–
	New Mexico thistle	CINE	*Cirsium neomexicanum*	0–6	–
	Coulter's spiderling	BOCO2	*Boerhavia coulteri*	0–6	–
	aridland goosefoot	CHDE	*Chenopodium desiccatum*	0–6	–
	sleepy silene	SIAN2	*Silene antirrhina*	0–6	–
	purslane	PORTU	*Portulaca*	0–6	–
	seaside heliotrope	HECUO	*Heliotropium curassavicum var. oculatum*	0–6	–
	longleaf false goldeneye	HELOL	*Heliomeris longifolia var. longifolia*	0–6	–
	crestrib morning-glory	IPCO2	*Ipomoea costellata*	0–6	–
	Thurber's morning-glory	IPTH	*Ipomoea thurberi*	0–6	–
	shaggyfruit pepperweed	LELA	*Lepidium lasiocarpum*	0–6	–
	sacred thorn-apple	DAWR2	*Datura wrightii*	0–2	–
	spurge	EUPHO	*Euphorbia*	0–2	–
	green carpetweed	MOVE	*Mollugo verticillata*	0–2	–
	manybristle chinchweed	PEPA2	*Pectis papposa*	0–2	–
	woolly plantain	PLPA2	*Plantago patagonica*	0–2	–
	desert unicorn-plant	PRAL4	*Proboscidea althaeifolia*	0–2	–
	doubleclaw	PRPA2	*Proboscidea parviflora*	0–2	–
	spreading fanpetals	SIAB	*Sida abutifolia*	0–2	–
	Wright's thistle	CIWR	*Cirsium wrightii*	0–2	–
	southwestern pricklypoppy	ARPL3	*Argemone pleiacantha*	0–2	–
	southwestern pricklypoppy	ARPL3	*Argemone pleiacantha*	0–2	–
	green carpetweed	MOVE	*Mollugo verticillata*	0–2	–
	curlytop gumweed	GRNUA	*Grindelia nuda var. aphanactis*	0–2	–
	Coulter's horseweed	LACO13	*Laennecia coulteri*	0–2	–
	woolly plantain	PLPA2	*Plantago patagonica*	0–2	–

	woolly plantain	PLPA2	*Plantago patagonica*	0–2	
	desert unicorn-plant	PRAL4	*Proboscidea althaeifolia*	0–2	–
	doubleclaw	PRPA2	*Proboscidea parviflora*	0–2	–
	spreading fanpetals	SIAB	*Sida abutifolia*	0–2	–
	vervain	VERBE	*Verbena*	0–2	–
	Wright's thistle	CIWR	*Cirsium wrightii*	0–1	–
	sacred thorn-apple	DAWR2	*Datura wrightii*	0–1	–
	American wild carrot	DAPU3	*Daucus pusillus*	0–1	–
Shrub/Vine					
6	**Miscellaneous shrubs**			6–84	
	fourwing saltbush	ATCA2	*Atriplex canescens*	1–28	–
	Mojave seablite	SUMO	*Suaeda moquinii*	0–28	–
	Griffiths' saltbush	ATGR2	*Atriplex griffithsii*	0–17	–
	cattle saltbush	ATPO	*Atriplex polycarpa*	0–17	–
	iodinebush	ALOC2	*Allenrolfea occidentalis*	0–17	–
	shadscale saltbush	ATCO	*Atriplex confertifolia*	0–6	–
	mule-fat	BASA4	*Baccharis salicifolia*	0–6	–
	rubber rabbitbrush	ERNAL	*Ericameria nauseosa ssp. consimilis var. leiosperma*	0–6	–
	pale desert-thorn	LYPA	*Lycium pallidum*	0–6	–
	broom dalea	PSSC6	*Psorothamnus scoparius*	0–6	–
	southern goldenbush	ISPL	*Isocoma pluriflora*	0–2	–
	fringed twinevine	FUCYC	*Funastrum cynanchoides ssp. cynanchoides*	0–2	–
	Drummond's clematis	CLDR	*Clematis drummondii*	0–2	–
	longleaf jointfir	EPTR	*Ephedra trifurca*	0–2	–
	lotebush	ZIOB	*Ziziphus obtusifolia*	0–2	–
	broom snakeweed	GUSA2	*Gutierrezia sarothrae*	0–1	–
	burroweed	ISTE2	*Isocoma tenuisecta*	0–1	–
	desertbroom	BASA2	*Baccharis sarothroides*	0–1	–
7	**Succulents**			0–22	
	candy barrelcactus	FEWI	*Ferocactus wislizeni*	0–6	–
	cactus apple	OPEN3	*Opuntia engelmannii*	0–6	–
	hedgehog cactus	ECHIN3	*Echinocereus*	0–1	–
Tree					
8	**Trees**			6–112	
	western honey mesquite	PRGLT	*Prosopis glandulosa var. torreyana*	6–112	–
	velvet mesquite	PRVE	*Prosopis velutina*	0–28	–
	western soapberry	SASAD	*Sapindus saponaria var. drummondii*	0–17	–
	catclaw acacia	ACGR	*Acacia greggii*	0–17	–

Animal community

Alkalai sacaton usually does not green up until the first summer rains in July, so the green season is the summer rainy season. Grazing must be concentrated in the summer to effectively utilize the forage resource. Areas of the

site should be fenced exclusively for best management of alkalai sacaton. Herbaceous forage on the site will be deficient in digestible protein in the fall-winter-spring period. Burning or mowing can be used to freshen old growth alkalai sacaton. Burning should only be used in years with good winter-spring rainfall and should be done in late February to early March. Spring re-growth should not be grazed until the first summer rains. Several species of atriplex occur on the site but in such small quantities that the site is not valuable as winter forage area.

Free water is available some of the year in playa areas, natural charcos, and discontinuous gullies. This factor, in combination with the mixture of wooded areas and open grassland, make the site home to a variety of wildlife, and important for a variety of migratory waterfowl including sandhill cranes.

Hydrological functions

This site occurs as grassy alluvial fans flanking the Willcox playa and as grassy floodplains along streams. It acts to absorb water and catch sediment from large flood events.

Recreational uses

Hunting, hiking, horseback riding, bird watching, photography

Wood products

In areas where mesquite has increased to moderate canopy levels (15-30%) there can be considerable fuel-wood available.

Inventory data references

Range 417s include 3 in good condition and 4 in fair condition.

Type locality

Location 1: Cochise County, AZ	
Township/Range/Section	T13S R25E S31
General legal description	Willcox Playa

Contributors

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Rangeland health reference sheet

Interpreting Indicators of Rangeland Health is a qualitative assessment protocol used to determine ecosystem condition based on benchmark characteristics described in the Reference Sheet. A suite of 17 (or more) indicators are typically considered in an assessment. The ecological site(s) representative of an assessment location must be known prior to applying the protocol and must be verified based on soils and climate. Current plant community cannot be used to identify the ecological site.

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Date	08/07/2013
Approved by	Byron Lambeth
Approval date	

Composition (Indicators 10 and 12) based on	Annual Production

Indicators

1. **Number and extent of rills:** None. However, this site can have a few rills (discontinuous, 30-50 feet long) when an associated feature such as an adjacent road drains water from the site.

2. **Presence of water flow patterns:** Water flow paths occupy 40-50% of the surface area. They are discontinuous, 20-50 feet in length and show signs of strengthening with recent drought.

3. **Number and height of erosional pedestals or terracettes:** Pedestals are common on alkalai sacaton and mound saltbush. They are between 1-2 inches in height. Terracettes are uncommon on the site.

4. **Bare ground from Ecological Site Description or other studies (rock, litter, lichen, moss, plant canopy are not bare ground):** Bare ground from the pace frequency transect (300 pts) done on site was 63%. Gravel cover was 0% and basal cover of live perennial grasses was 5%. Vegetation occurs in patches with bare areas up to 5-8’ diameter. Bare areas are generally connected.

5. **Number of gullies and erosion associated with gullies:** None

6. **Extent of wind scoured, blowouts and/or depositional areas:** None

7. **Amount of litter movement (describe size and distance expected to travel):** Fine litter size classes are moving a few feet in bare areas and water flow areas. Coarse litter staying in place under grass and shrubs.

8. **Soil surface (top few mm) resistance to erosion (stability values are averages - most sites will show a range of values):** Values from a soil slake test average 3.3. About 50% of the ratings were 1-3s and 50% of the ratings were 4-6s.

9. **Soil surface structure and SOM content (include type of structure and A-horizon color and thickness):** An1 horizon is a sandy clayloam, 1 inch thick with weak medium and thin platy structure and low organic matter. The An2 horizon (bisquit caps on columnar structure) is sandyloam with vesicular structure. Colors are 7.5 YR 7/2 dry and 7.5 YR 4/4 moist.

10. **Effect of community phase composition (relative proportion of different functional groups) and spatial distribution on infiltration and runoff:** A shrub, mound saltbush, and perennial grasses dominate the site. Alkalai sacaton grass canopy is 16.7% and mound saltbush canopy is 14% on this site. Annual forbs/grass canopy fluctuates with rainfall. Vegetation presents in a patchy distribution. Bare areas act as a watershed supplementing soil moisture of perennial vegetation patches.

11. **Presence and thickness of compaction layer (usually none; describe soil profile features which may be mistaken for compaction on this site):** None present, average depth of penetration from an ARS field penetrometer with a 2.2 kg. sliding hammer, set at 20 inches fall height, is 6.4 cm. The dense (massive structure) siltyclay Btknz1 horizon at 3 inches can feel like a compacted layer.

12. **Functional/Structural Groups (list in order of descending dominance by above-ground annual-production or live foliar cover using symbols: >>, >, = to indicate much greater than, greater than, and equal to):**

    Dominant: perennial grasses = shrubs >

    Sub-dominant: annual grasses > annual forbs > perennial forbs > trees > succulents

    Other:

    Additional:

13. **Amount of plant mortality and decadence (include which functional groups are expected to show mortality or decadence):** Mortality estimated at about 20% on perennial grasses, likely due to drought and grazing.
    Mortality on shrubs is estimated at 10%, also likely due to drought and grazing.

14. **Average percent litter cover (%) and depth (in):** Litter cover ranged from 13-32%. Litter was generally confined to vegetation patches.

15. **Expected annual annual-production (this is TOTAL above-ground annual-production, not just forage annual-production):** 422 lbs/ac. in a below average year; 1060 lbs/ac. in an average year; 2070 lbs/ac. in an above average year. Production of summer annual grasses can exceed expected on years with above average seasonal precipitation.

16. **Potential invasive (including noxious) species (native and non-native). List species which BOTH characterize degraded states and have the potential to become a dominant or co-dominant species on the ecological site if their future establishment and growth is not actively controlled by management interventions. Species that become dominant for only one to several years (e.g., short-term response to drought or wildfire) are not invasive plants. Note that unlike other indicators, we are describing what is NOT expected in the reference state for the ecological site:** mesquite, tumbleweed and cocklebur

17. **Perennial plant reproductive capability:** Not impaired.