

ESR Vegetation Inventory and Releve Analysis Report

Sunset Road Silverbell Road to I-10 (Segment I)

Prepared for:



Submitted to:



Submitted by:

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1.0 INTRODUCTION & PROJECT LOCATION

Segment I of the Sunset Road project will construct Sunset Road from Silverbell Road to Interstate 10 (I-10) Eastbound Frontage Road (EBFR) at existing grade. The project includes a new bridge across the Santa Cruz River and an at-grade intersection with the existing I-10 EBFR.

Sunset Road will be constructed as a three-lane roadway (one lane in each direction of travel with a two-way left-turn lane) with appropriate auxiliary lanes at the intersections with Silverbell Road and the I-10 frontage road.

Wheat Design Group (WDG) conducted a Native Plant Inventory for Segment I in accordance with the PCDOT Memorandum of November 2013, update to Appendix 4D of the Environmentally Sensitive Roadway (ESR) Design Guidelines, in PCDOT's Roadway Design Manual.

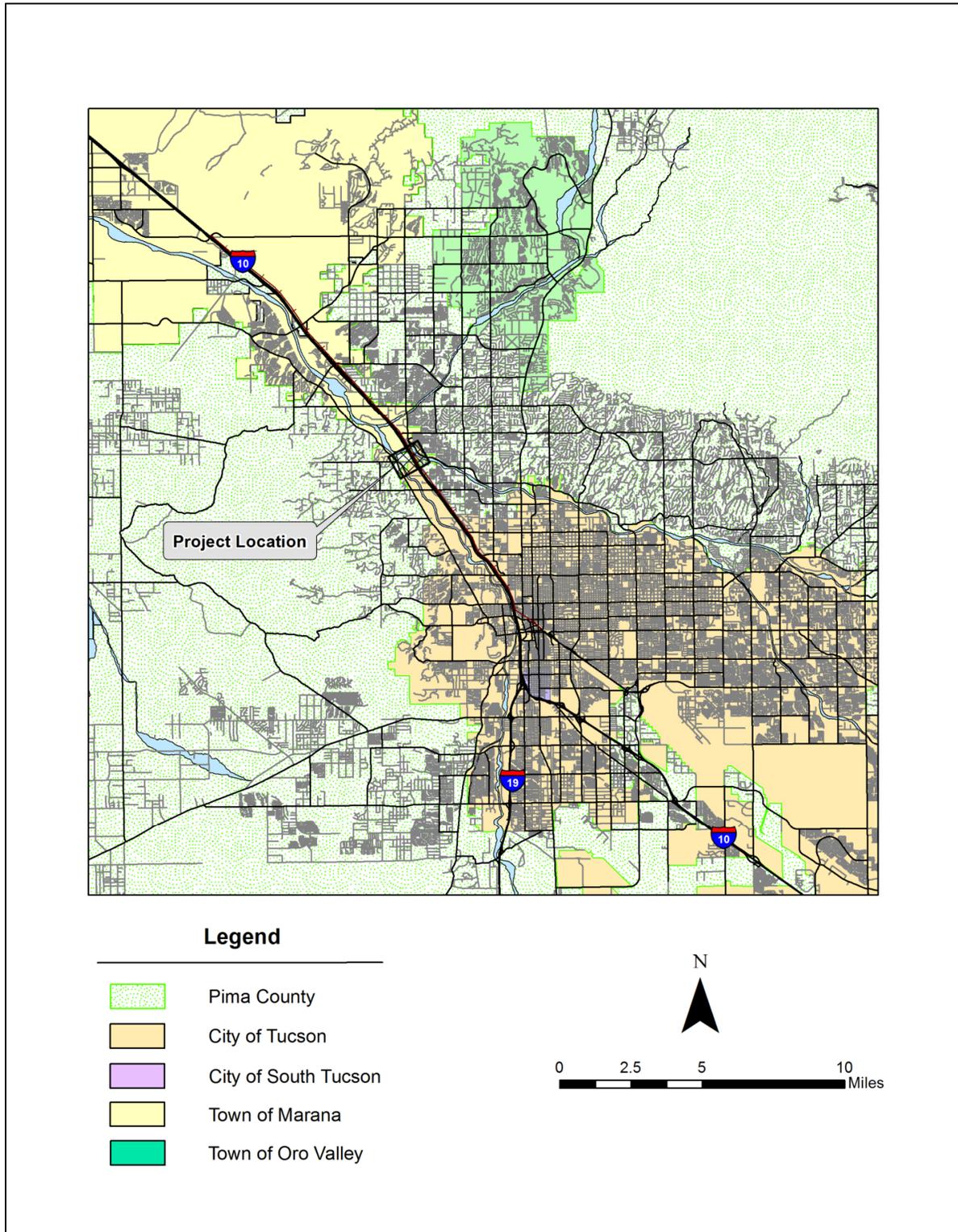
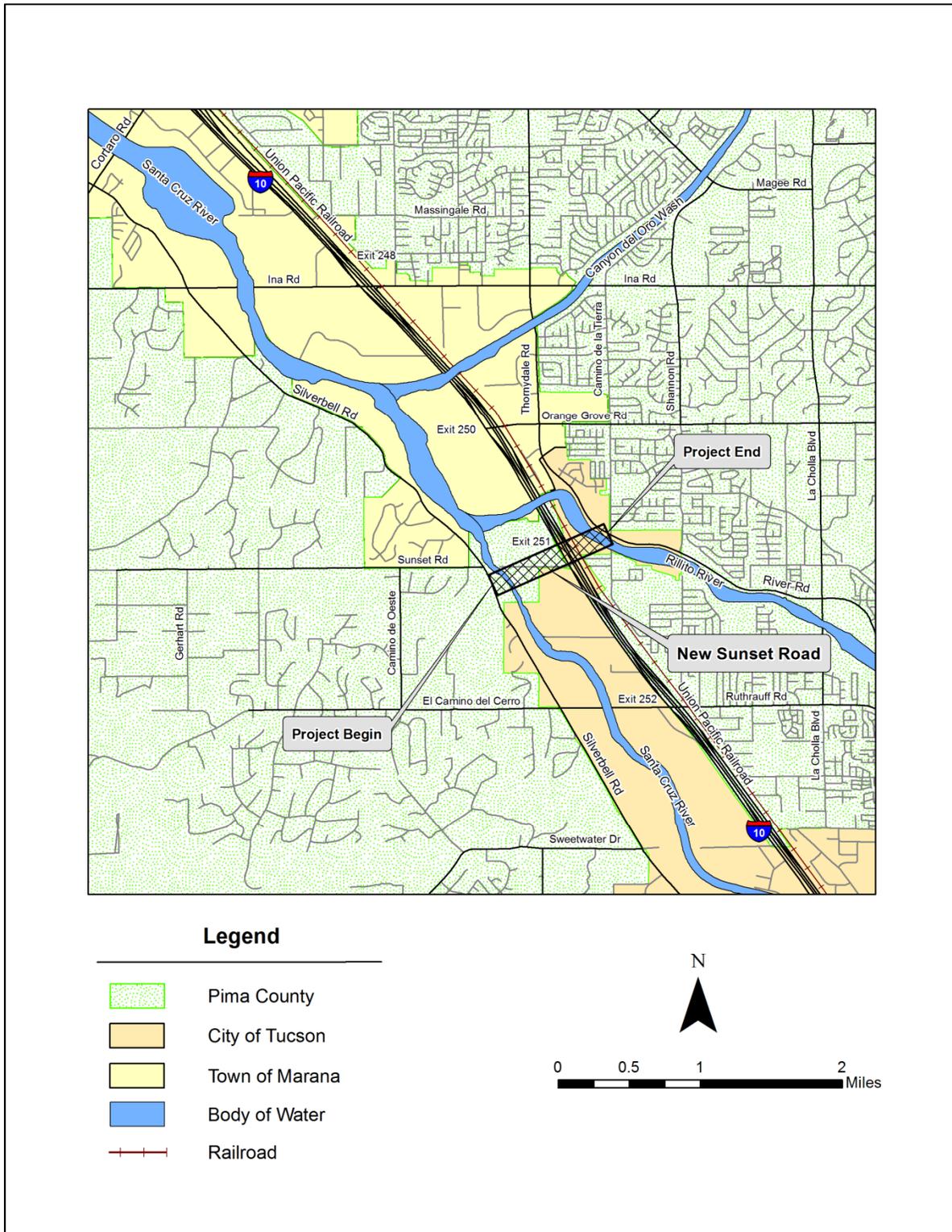


Figure 1 – Project Location Map



2.0 REGULATED RIPARIAN HABITAT

Mesoriparian H and Xeroriparian C Riparian Habitats are present within the project limits. At the time this report was written, the total Mesoriparian H Riparian habitat disturbance and total Xeroriparian C Riparian habitat disturbance within the project limits is not known as the construction limits have not been finalized.

Per the Pima County Regional Flood Control District Regulated Riparian Habitat Ordinance and Mitigation Standards and Implementation Guidelines, a Riparian Habitat Mitigation Plan is required when disturbance is greater than 0.33 acres. It is anticipated that disturbance will exceed 0.33 acres, and that Riparian Mitigation will be required.

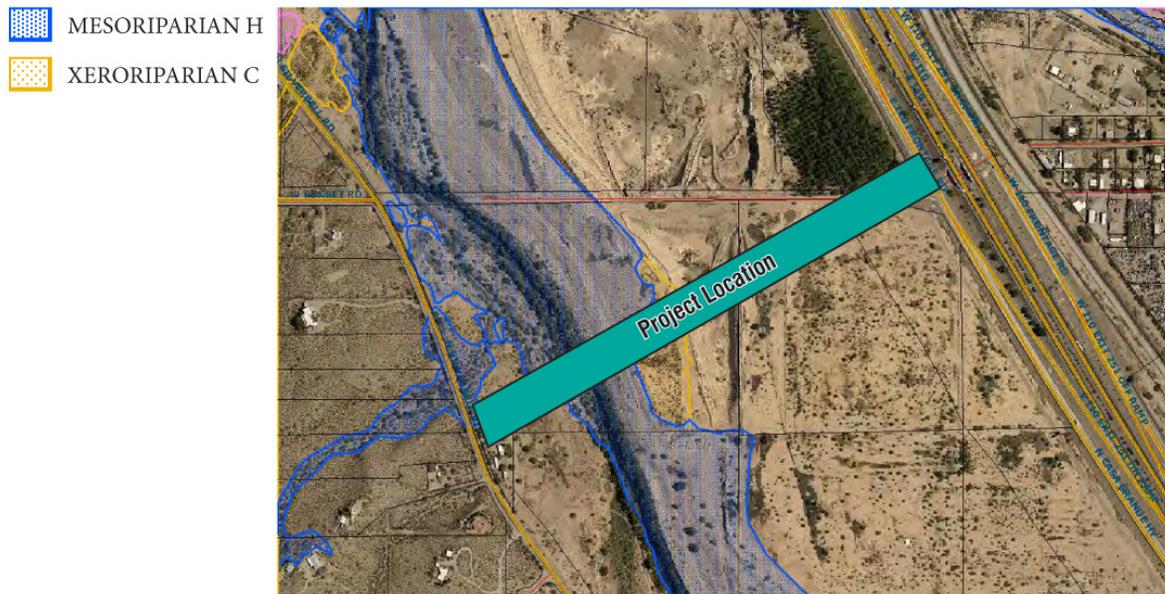


Figure 3 – Pima County GIS Map of Riparian Areas

3.0 NATIVE PLANT INVENTORY

The inventory was conducted per the requirements of the Pima County Environmentally Sensitive Roadway Guidelines as published in the Roadway Design Manual and modified by PCDOT Memorandum dated November 2013.

All areas within the project disturbance limits were inventoried. The project disturbance limits represent the area to be tested for cultural resources by Pima County. This is also the area to be “cleared” for the EAMR. It is anticipated that the actual construction limits will be smaller than the disturbance limits shown. Once construction limits are set, preservation fencing will be shown on plans to protect plants in place outside of construction limits.

Refer to the accompanying Plant Inventory Plans, Sheets NP01 – NP07 for mapped locations of each inventoried plant.

3.1 ESR Mitigation Calculations

Mitigation calculations have not been performed at this time as disturbance area and plantable area (for trees) are not known. Calculations will be performed once appropriate data is available. All required mitigation plantings will be included on the project Planting Plans. Note that no saguaros are present on site.

4.0 RELEVE ANALYSIS

WDG conducted a releve analysis per the requirements of the Pima County Environmentally Sensitive Roadway Guidelines as published in the Roadway Design Manual and modified by PCDOT Memorandum dated November 2013.

A total of nine releve plots were established and used for data collection. Six of the plots were located in desert scrub plant community, while the other three were located in riparian plant communities. The first set of data was collected on December 4, 2013. The second set of releve data was collected from the previously established plots on April 17, 2014

Preliminary releve locations were selected based on aerial assessment of vegetation. Final releve locations were adjusted based upon field conditions (the selected releve area is representative of the site's vegetation). Several releves were located outside of the project limits in order to obtain a more representative plant community sample. Much of the project area has been previously disturbed, and lacks representative vegetation. Circular 20-foot radius releves were sampled. The center of the plot was marked with a stake and plot boundaries were temporarily defined with flagging. Refer to ESR Releve Locations sheet NPS03 for releve locations.

4.1 Releve Data

The following tables for desert scrub and riparian vegetative entities show existing plant density and replanting density for tall pots and container plants.

Latin Name	Common Name	R1	R2	R3	R4	R5	R8	Total Density	Avg Density /Acre	Invasive
Trees										
Prosopis velutina	velvet mesquite	4	3					7	40.23	
Shrubs										
Ambrosia deltoidea	triangleleaf bursage						x	0	0.00	
Baccharis sarothroides	desert broom		x	11 2		1		113	649.43	
Encelia farinosa	brittle bush	x						0	0.00	
Larrea tridentata	creosote	1		1	13	1	22	38	218.39	
Lycium berlandieri	wolfberry					1		1	5.75	
Ziziphus obtusifolia	graythorn						x	0	0.00	
Herbaceous										
Amsinckia intermedia	common fiddleneck						12	12	68.97	
Atriplex linearis	narrow-leaf saltbush		x					0	0.00	
Atriplex polycarpa	cattle saltbush				2	72		74	425.29	
Cryptantha angustifolia	panamint cryptantha		12	20 0				212	1218.3 9	
Datura wrightii	sacred datura							0	0.00	
Dieteria asteroides	fall tansyaster		x					0	0.00	
Isocoma tenuisecta	burroweed		x	35			1	36	206.90	
Lepidium lasiocarpum	shaggyfruit pepperweed				37	40		77	442.53	
Phacelia distans	wild heliotrope						2	2	11.49	
Proboscidea parviflora	devils claw		x					0	0.00	
Sisymbrium spp	wild mustard	x	x	x	x	x	x	0	0.00	i
Solanum elaeagnifolium	silverleaf nightshade	x						0	0.00	
Verbesina encelioides	crownbeard	x						0	0.00	
Grasses										
Sorghum halepense	johnsongrass					1		1	5.75	i
Vulpia octoflora	sixweeks fescue	x	x	x	x	x		0	0.00	

x = present in vicinity

Figure 4 – Desert Scrub Releve Data

Latin Name	Common Name	R6	R7	R9	Total Density	Avg Density/ Acre	Invasive
Trees							
Prosopis velutina	velvet mesquite				0	0.00	
Salix	willow	2	2	3	7	80.46	
Tamarix chinensis	five-stamen tamarisk	1	x		1	11.49	i
Shrubs							
Baccharis sarothroides	desert broom	x		6	6	68.97	
Larrea tridentata	creosote				0	0.00	
Lycium berlandieri	wolfberry				0	0.00	
Ziziphus obtusifolia	graythorn				0	0.00	
Herbaceous							
Ambrosia ambrosioides	canyon ragweed	x		1	1	11.49	
Amsinckia tessellata	bristly fiddleneck		9	100	109	1252.87	
Datura wrightii	sacred datura			x	0	0.00	
Eriogonum deflexum	flatcrown buckwheat		3		3	34.48	
Isocoma tenuisecta	burroweed				0	0.00	
Lapula occidentalis	flatspine stickseed		9	10	19	218.39	
Lepidium lasiocarpum	shaggyfruit pepperweed		9	1	10	114.94	
Nicotiana obtusifolia	desert tobacco			x	0	0.00	
Pectocarya recurvata	curvenut combseed		x		0	0.00	
Phacelia distans	wild heliotrope		1		1	11.49	
Physaria gordonii	bladderpod		1		1	11.49	
Sisymbrium spp	wild mustard	x	x	x	0	0.00	i
Solanum elaeagnifolium	silverleaf nightshade				0	0.00	
Xanthium strumarium	rough cockleburr		14		14	160.92	
Grasses							
Arundo donax	giant reed	x	1		1	11.49	i
Avena fatua	wild oat		8		8	91.95	
Bromus catharticus	rescuegrass		2		2	22.99	
Chlorus virgata	feather fingergrass		36				
Cynodon dactylon	Bermuda grass	x	x	x	0	0.00	i
Hordeum glaucum	smooth barley		1		1	11.49	
Pennisetum ciliare	buffelgrass		22		22	252.87	i
Sorghum halepense	johnsongrass	104	26	113	243	2793.10	i
Vulpia octiflora	sixweeks fescue		x		0	0.00	

x = present in vicinity

Figure 5 – Riparian Releve Data

4.2 Proposed Seed Mixes

The following considerations influenced the seed mix development:

- Two seed mixes are proposed.
 - The Desert Scrub seed mix does not contain tree seed, as it will be used in clear zone areas.
 - The Riparian seed mix does contain tree seed, and is in compliance with the plant list found in Appendix B of the “Regulated Riparian Habitat Mitigation Standards and Implementation Guidelines.” We have been in communication with Marissa Rice, Regional Flood Control Water Resources Division, who has provided guidance on seed species that have done well on nearby projects.

Scientific Name	Common Name	Percent of total	Translation to 20 PLS/acre
Shrubs		32.00%	
<i>Ambrosia deltoidea</i>	Triangle leaf bursage	6.00%	1.20
<i>Atriplex linearis</i>	Narrow-leaf saltbush	5.00%	1.00
<i>Atriplex polycarpa</i>	Cattle saltbush	5.00%	1.00
<i>Calliandra eriophylla</i>	Fairyduster	2.00%	0.40
<i>Encelia farinosa</i>	Brittlebush	4.00%	0.80
<i>Gutierrez sarothrae</i>	Snakeweed	2.00%	0.40
<i>Isocoma tenuisecta</i>	Burrowweed	2.00%	0.40
<i>Larrea tridentata</i>	Creosote	6.00%	1.20
Grasses		50.00%	
<i>Aristida purpurea</i>	Purple threeawn	12.00%	2.40
<i>Bouteloua curtipendula</i> 'Vaughn'	Sideoats grama	9.00%	1.80
<i>Digitaria californica</i>	Arizona cottontop	9.00%	1.80
<i>Sporobolus cryptandrus</i>	Sand Drop Seed	9.00%	1.80
<i>Sporobolus wrightii</i>	Sacaton	11.00%	2.20
Forbs		18.00%	
<i>Baileya multiradiata</i>	Desert marigold	3.00%	0.60
<i>Dyssodia pentachaeta</i>	Golden Dyssodia	3.00%	0.60
<i>Lepidium lasiocarpum</i>	Shaggyfruit pepperweed	3.00%	0.60
<i>Lupinus sparsiflorus</i>	Lupine	3.00%	0.60
<i>Senna covesii</i>	Desert senna	3.00%	0.60
<i>Sphaeralcea ambigua</i>	Desert globemallow	3.00%	0.60
TOTAL		100.00%	20.00

Figure 6 – Proposed Seed Mix – Desert Scrub

Scientific Name	Common Name	Percent of total	Translation to 20 PLS/acre
Trees		15.00%	
<i>Acacia constricta</i>	Whitethorn acacia	3.00%	0.60
<i>Acacia greggii</i>	Catclaw acacia	3.00%	0.60
<i>Celtis reticulata</i>	Canyon hackberry	3.00%	0.60
<i>Chilopsis linearis</i>	Desert willow	3.00%	0.60
<i>Prosopis velutina</i>	Velvet mesquite	3.00%	0.60
Shrubs		19.00%	
<i>Atriplex canescens</i>	Four-winged slatbush	2.00%	0.40
<i>Calliandra eriophylla</i>	Fairy duster	4.00%	0.80
<i>Celtis pallida</i>	Desert hackberry	3.00%	0.60
<i>Ericameria laricifolia</i>	Turpentine bush	3.00%	0.60
<i>Lycium berlandieri</i>	Wolfberry	4.00%	0.80
<i>Ziziphus obtusifolia</i>	Greythorn	3.00%	0.60
Grasses		48.00%	
<i>Bouteloua aristidoides</i>	Needle Grama	8.00%	1.60
<i>Bouteloua curtipendula</i>	Sideoats grama	8.00%	1.60
<i>Bouteloua rothrockii</i>	Rothrock grama	8.00%	1.60
<i>Setaria macrostachya</i>	Plains bristlegrass	8.00%	1.60
<i>Sporobolus airoides</i>	Alkali sacaton	8.00%	1.60
<i>Sporobolus cryptandrus</i>	Sand dropseed	8.00%	1.60
Forbs		18.00%	
<i>Clematis drummondii</i>	Old man's beard	3.00%	0.60
<i>Cucurbita digitata</i>	Fingerleaf gourd	3.00%	0.60
<i>Encelia farinosa</i>	Brittlebush	3.00%	0.60
<i>Glandularia gooddingii</i>	Southwestern mock vervain	3.00%	0.60
<i>Lesquerella gordonii</i>	Bladderpod	3.00%	0.60
<i>Sphaeralcia ambigua</i>	Globemallow	3.00%	0.60
TOTAL		100.00%	20.00

Figure 7 – Proposed Seed Mix – Riparian