

Landscape Guidelines

The El Rio landscape guidelines were developed to provide suggestions showcasing the diversity of plant material that can be used to reinforce the low water use native planting habitats that are prevalent within, and adjacent to, the Gila River's riparian ecosystem. The landscape guidelines were developed to provide the El Rio project area a unique native plant habitat and overall aesthetic that offers appropriate transitions from the riparian ecosystem to a more robust upland landscape.



Avondale





5.1 El Rio Corridor Plant Palettes

The El Rio Design Guidelines and Planning Standards has provided an opportunity to define the Gila River as a signature corridor within the communities of Avondale, Buckeye, Goodyear and unincorporated areas of Maricopa County. The development of these guidelines will help to reinforce this place as a calling card for the region and to establish the El Rio corridor as a catalyst for change. This effort can be reflected in the El Rio corridor plant palette selections. The El Rio corridor plant palette offers an opportunity to accentuate the natural beauty of the region while providing the diversity and flexibility of plant material selections that can transition from the native Gila River habitat to a more structured development aesthetic.

The cities of Avondale, Goodyear, Buckeye and unincorporated Maricopa County recognize that the landscape has a direct correlation to the wildlife that is dependent on a healthy river ecosystem. The purpose of these guidelines is to provide a conceptual framework for a landscape aesthetic treatment specific to the El Rio area that would enhance the corridor while also providing the diversity of planting that will benefit native and migrating wildlife.

There are high quality and sensitive habitats within the project area, which will be identified as part of the FCDMC El Rio Vegetation Management Plan for the Lower Gila River in Maricopa County, Arizona and the City of Buckeye's In-lieu fee program.

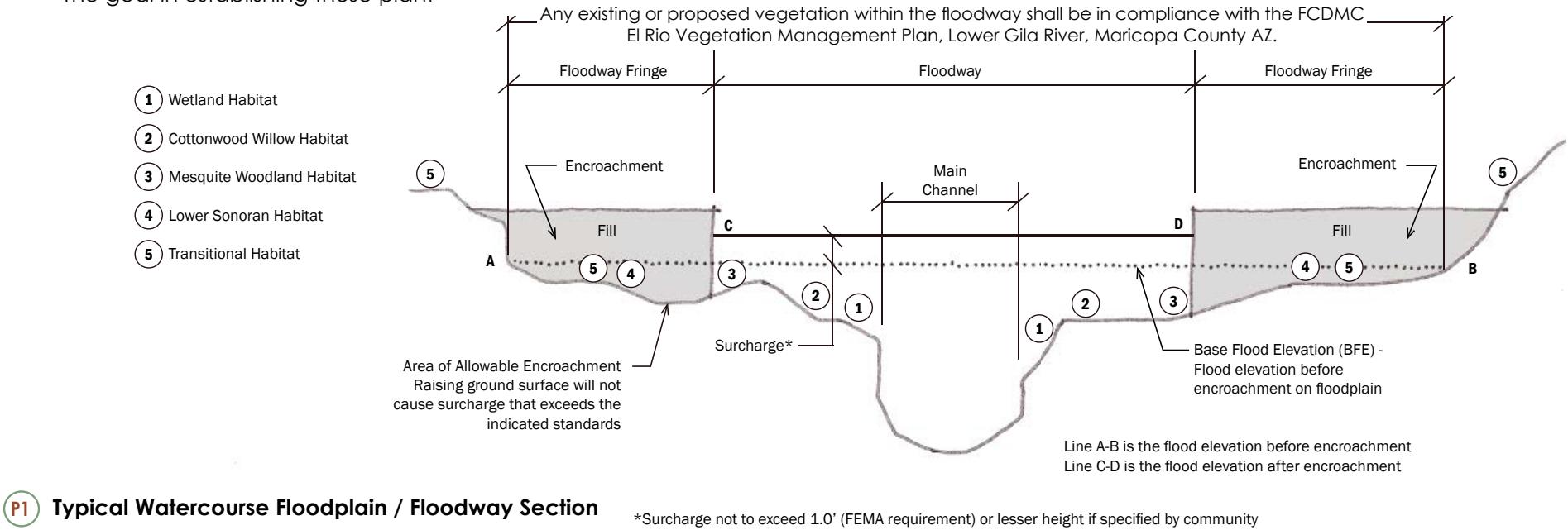
Illustration P1 shows the typical watercourse floodplain / floodway section that graphically depicts the areas where the plant habitats described within these guidelines would have the greatest potential to flourish. It would be in the floodway fringe area where development potential exists and where the lower Sonoran and transitional plant palettes described later in this section may be most applicable. However the plant palettes provided herein would allow adjacent development to implement any of the plant habitats described within this document, all dependent upon specific site location, and the proximity to, or availability of, water.

These landscape guidelines were developed to provide the Cities of Avondale, Buckeye, Goodyear, and areas of unincorporated Maricopa County with a diversity of plant palettes that are flexible and easily modified for implementation. The goal in establishing these plant

habitats and associated palettes is to allow any streetscape, trailhead, trail corridor, drainage corridor, or adjacent development associated with the El Rio project area the ability to blend and visually connect their specific design with that of the FCDMC El Rio Vegetation Management Plan for the Lower Gila River in Maricopa County, Arizona.

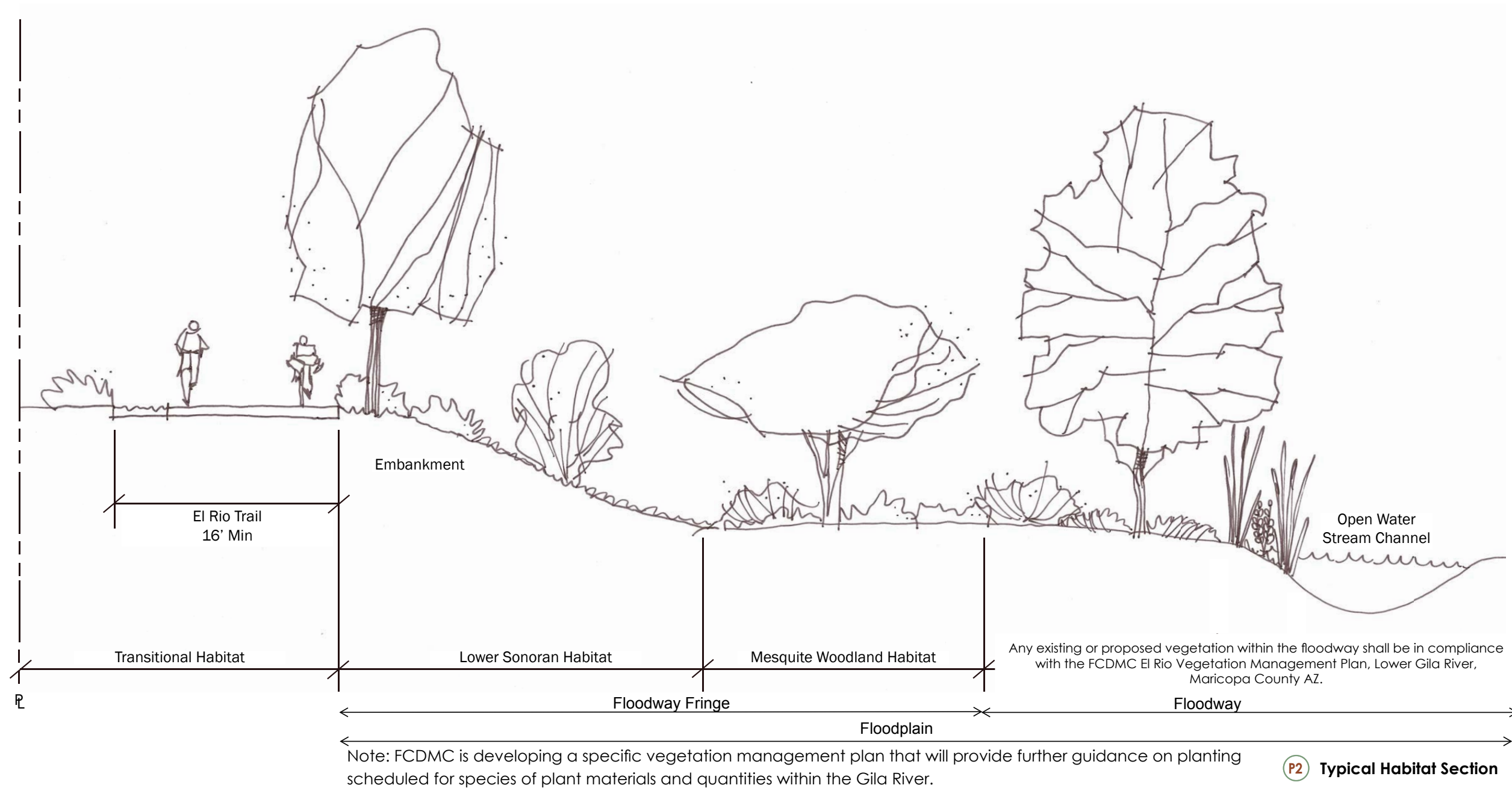
The result of establishing these flexible plant habitats as a framework creates a baseline for comparison to any planting designs within the project area. These guidelines can easily be modified and adopted beyond established rights-of-way and used for any surrounding development. The goal is to maintain a common aesthetic experience for public and private developments that maintains a relationship to the El Rio Design Guidelines and Planning Standards and highlights the importance of the Gila River to each city's and Maricopa County development.

The Cities of Avondale, Buckeye, Goodyear and unincorporated areas of Maricopa County will encourage private development to incorporate these design themes within the El Rio area. Utilizing elements of the El Rio design theme will reinforce the cohesive development aesthetic for the El Rio corridor while also providing vitally important wildlife habitats. However, should adjacent private developments implement a different identity and character for their specific properties, the El Rio river corridor will sufficiently retain its own identity and visual character through the use of these plant palettes and landscape guidelines.



P1 Typical Watercourse Floodplain / Floodway Section

Landscape Guidelines



The illustration P2 depicts typical plant habitat zones associated with a Sonoran Desert river environment. The development and implementation of the habitat types shown is dependent upon location and design intent and will be dictated by the FCDMC El Rio Vegetation

Management Plan, for the Lower Gila River, in Maricopa County. It is provided as a conceptual idea that could be utilized as part of a river restoration project. It is also provided as a template for any publicly accessible wetland or river ecosystem demonstration projects that may be

implemented within the project area. These habitats and their respective plant species and densities are described later in this document but would be done fully recognizing the influence of the FCDMC El Rio Vegetation Management Plan, for the Lower Gila River, in Maricopa County.



Wetland Habitat

Wetland planting habitats depicted in this report should be used in either public and/or private developments that want to try and capitalize on existing or developed open water areas within the floodway fringe of the El Rio Design Guidelines and Planning Standards area. This habitat will showcase the beauty and diversity of a wetland habitat. The implementation of this habitat could be part of a landscape that is focused on rehabilitation, repurposing of a former sand and gravel operation within the floodway fringe area, or showcasing a wetland habitat as a key element of a private development landscape.

Wetland plantings are dependent upon water surface levels being available and maintained. The normal maximum water surface elevation in a wetland area can be assumed to be 0 feet (relative elevation). Water level controls may need to be installed that are connected to a pump station or other water level control device. The pump will turn on when the water drops to a relative elevation of -1 feet and will automatically turn off when the water rises to 0 feet. The wetland communities will occur at elevations below 0 feet, which will correspond with a hydroperiod of continuously saturated to continuously inundated. The cottonwood/willow habitat (discussed later in this report) will begin at 0 ft and will extend upward in elevation

in areas above the continuous saturation zone.

The wetland communities should consist of a mosaic of vegetated shallow marsh, deep marsh, submerged/floating zone, and open water areas. The floodway fringe wetland planting areas should be configured to leave access points for maintenance activities and the application of vector control measures. This blend of wetland features should be designed to balance habitat value, water consumption, vector control, and operation and maintenance requirements. There should be the ability to raise and lower the water level in each pond or wetland to aid in plant establishment and vector control. It is understood that the project area has a high existing groundwater table that will make draining these ponds difficult. The specific wetland communities are discussed in greater detail on the following pages for use in any floodway fringe area as the floodway treatments would be controlled by the FCDMC El Rio Vegetation Management Plan, for Lower Gila River, in Maricopa County.

Shallow Marsh and Deep Marsh Zones

Vegetation communities in riparian areas are typically found growing on alluvial features that roughly parallel the river channel, or in disturbed landscapes, on or around open pockets of water. Two wetland plant communities – shallow marsh and deep marsh – could be established on and around existing open water areas in the floodway fringe portions of the project area. The shallow marsh vegetation zone will be established from 0 to -1 feet in relative elevation, where 0 feet is the normal maximum water surface elevation. The hydrologic regime in the shallow marsh should be continuously saturated to shallowly inundated up to a depth of 1 foot. The deep marsh vegetation zone should be established in the relative elevation range of -1 to -2.5 feet. The hydrologic regime in the deep marsh should be continuous inundation with water depths extending from the ground surface to 2 feet in depth.

Both the shallow marsh and deep marsh zones should be planted with a variety of native emergent and riparian species to provide structure and function to the wetland, provide some improvement in water quality, provide wildlife habitat and provide enhanced aesthetics. These proposed plant species are listed in Table 5-1. Multiple species of bulrush will be the target plant species in the permanently inundated areas; however, cattails will likely encroach and may eventually dominate in shallow persistent waters unless active control measures are implemented.

Emergent marsh zones should be strategically sized and located in the wetland basins to reduce the potential for mosquito breeding. For example, the emergent marsh zone edge should be accessible for larvicide and/or herbicide applications if required, and should be bordered by sufficiently deep water to maintain communities of larval eating fish.

Submerged Floating Zones

The submerged/floating zone should be established in the relative elevation range of -2 to -3 feet and will be continuously inundated with water at depths of 1.5 to 3.5 feet. The submerged floating zone will serve to diversify wetland habitat, provide a dry-season refuge for fish and other aquatic fauna, convey high flows with minimal frictional losses, and increase residence time for ancillary water quality improvement. Most of the submerged/floating zone should be planted with submerged plants and floating plants, however, the upper reaches of this zone should be planted with giant bulrush – an emergent wetland plant. Giant bulrush should initially be established in water depths that are relatively shallow (i.e., <1 feet), however, once established will flourish and expand to deeper waters. The planting list for this zone is noted on Table 5-1.

Table 5-1 represents a preliminary list of proposed plant species by zone. This list has been compiled from the planting plans developed for the Rio Salado and Tres Rios projects and reflects the results of a qualitative field-assessment of successful

Table 5-1 Proposed Plant Species by Zone	
Botanical Name	Common Name
Shallow Marsh	
<i>Sagittaria latifolia</i>	Broadleaf arrowhead
<i>Schoenoplectus acutus</i>	Hardstem bulrush
<i>Schoenoplectus americanus</i>	Three-square bulrush
<i>Veronica anagallis-aquatica</i>	Water speedwell
Deep Marsh	
<i>Sagittaria latifolia</i>	Broadleaf arrowhead
<i>Schoenoplectus acutus</i>	Hardstem bulrush
<i>Schoenoplectus californicus</i>	Giant bulrush
Submerged/Floating Zone	
<i>Schoenoplectus californicus</i>	Giant bulrush
<i>Hydrocotyl verticillata</i>	Whirled marsh pennywort
<i>Ceratophyllum demersum</i>	Coontail
<i>Potamogeton nodosus</i>	Long leaf pondweed

plantings at these two related projects.

Emergent plantings in the shallow marsh and deep marsh will be dominated by bulrush (*Schoenoplectus* sp.) but will also include other species such as arrowhead (*Sagittaria latifolia*.) and water speedwell (*Veronica anagallis-aquatica*). Emergent zone propagules should be installed at an average density of about 4,000 plants per acre (approximately 3 feet on center).

The submerged/floating vegetation zone should be designed as a combination of vegetation and open water zone. This zone will be planted with mat-forming vegetation, emergent species that are tolerant of deeper water, and submerged aquatic species. The planted species

should be installed at an average density of about 4,000 plants per acre (approximately 3 feet on center), whereas propagules of the floating plants will be distributed in the open water.



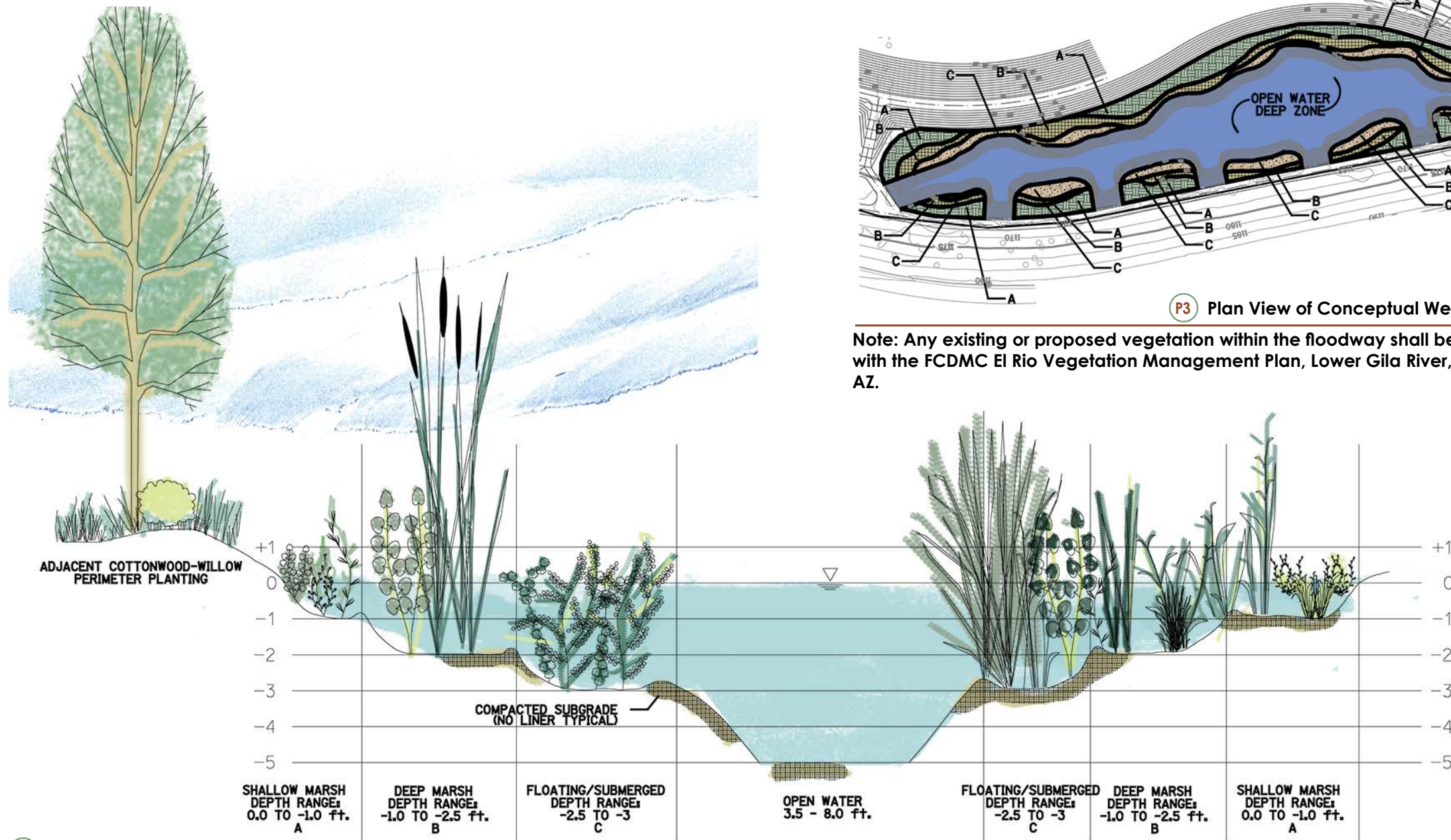
Wetland Plant Legend (see note below)

PATTERN TYPE	PLANT TYPE	SELECTED SPECIES AND SCIENTIFIC NAME
	WETLAND MARSH: EMERGENT & SPREADING PLANTS	
A	SHALLOW MARSH DEPTH RANGE: 0.0 TO -1.0 ft.	SCIRPUS AMERICANUS, SCIRPUS ACUTUS, SAGITTARIA GREGGII, SAGITTARIA LATIFOLIA, ALISMA TRIVIALE
B	DEEP MARSH DEPTH RANGE: -1.0 TO -2.5 ft.	SCIRPUS CALIFORNICUS, SCIRPUS VALIDUS
C	FLOATING/SUBMERGED DEPTH RANGE: -2.5 TO -3	HYDROCOTYLE SP., LUDWEGIA PALUSTRIS, POLYGONUM HYDROPIPEROIDES, POTAMOGETON SP., RORIPPA NASTURTIUM-AQUATICUM, VERONICA SP.
	OPEN WATER: DEEP ZONE	



P3 Plan View of Conceptual Wetland Planting Plan

Note: Any existing or proposed vegetation within the floodway shall be in compliance with the FCDMC El Rio Vegetation Management Plan, Lower Gila River, Maricopa County AZ.



P4 Wetland Habitat Typical Section

Typical wetland planting section for floodway fringe areas. Any existing or proposed vegetation within the floodway shall be in compliance with the FCDMC El Rio Vegetation Management Plan, Lower Gila River, Maricopa County AZ.

Cottonwood/Willow Habitat

The cottonwood/willow habitat plant palette can provide a habitat that serves as a transition between a wetland habitat and a more xeric habitat. As with the wetland habitat, the cottonwood/willow plant palette allows both public and private development to capitalize on existing or developed open water areas within the designated floodway fringe areas of the El Rio Design Guidelines and Planning Standards area. This habitat can serve as a transition from a wetland open water habitat to a more forested tree canopy habitat. The implementation of this habitat could be part of a floodway fringe landscape that is focused on the rehabilitation and/or repurposing of a former sand and gravel operation, or showcasing a cottonwood/willow habitat as a key element of a development. The need for a higher groundwater table and the ability to recreate a “flood” of an area of cottonwood/willow to assist with regeneration and establishment of these two main species may limit the use of this



habitat within a private development area. However, the plant palette beyond the main species of cottonwood and willow provides plant diversity that can be utilized in creating a transitional plant palette for both public and private developments in the floodway fringe areas.

The cottonwood/willow habitat can serve as a transitional habitat from the wetland aquatic zones to the drier mesquite woodlands and as a link between wetlands. As the name implies, dominant canopy species include cottonwoods (*Populus fremontii*) and willows (*Salix goddingii* and *S. exigua*). Other important canopy species include ash (*Fraxinus velutina*) and elderberry (*Sambucus mexicana*) in mesic areas and mesquite (*P. velutina* and *P. pubescens*) in drier areas. Cottonwood/willow habitats within the project corridor and any water conveyance channel would use water from existing groundwater and potential storm water flows conveyed by a series of created rills and other methods fed by the wetland ponds or reservoirs. Reshaping the ground surface around the existing open water areas can provide an area for interconnected small channels that would create a wetted perimeter of soils that will aid in the establishment and continued growth of cottonwood and willow plantings. This aspect will also help create saturated groundwater conditions conducive to long term growth and survivability.

The succession of cottonwood/willow habitat should have an initial, low vegetation stage consisting of 0 to 7 years of growth following planting, followed by a medium height stage of 7 to 14 years, and



a mature stage lasting from 20 to 100 years.

These trees can be planted both from containers and as pole plantings. Pole plantings are done at a higher density than would be found in nature, but will allow for a natural progression of habitat development as stronger plants mature and dominate the area. Willows and cottonwoods have been used extensively for riparian restoration projects because they are easily established. Poles or cuttings can be obtained from commercial nurseries or from native stands located near the project site.

Commercial sources for cottonwood and willow cuttings are also available on a seasonal basis. If the plant stock comes from a commercial supplier, the supplier needs to ensure that the plant materials are from a local ecotype and/or were gathered or had their origins from within the same watershed or been hybridized and have proven attributes that allow them to survive and flourish in the lower Sonoran Desert habitat frequented by prolonged drought and heat with a water source that tends to be highly saline.



COTTONWOOD/WILLOW HABITAT TREE SCHEDULE

	BOTANICAL NAME	COMMON NAME	QUANTITY PER ACRE
	BACCHARIS SALICIFOLIA	SEEP WILLOW	97
	FRAXINUS VELUTINA	VELVET ASH	5
	POPULUS FREEMONTII	COTTONWOOD	18
	PROSOPIS PUBESCENS	SCREWBEAN MESQUITE	11
	PROSOPIS VELUTINA	VELVET MESQUITE	22
	SALIX GOODINGII	GOODING'S WILLOW	37
	SAMBUCUS MEXICANA	ELDERBERRY	18

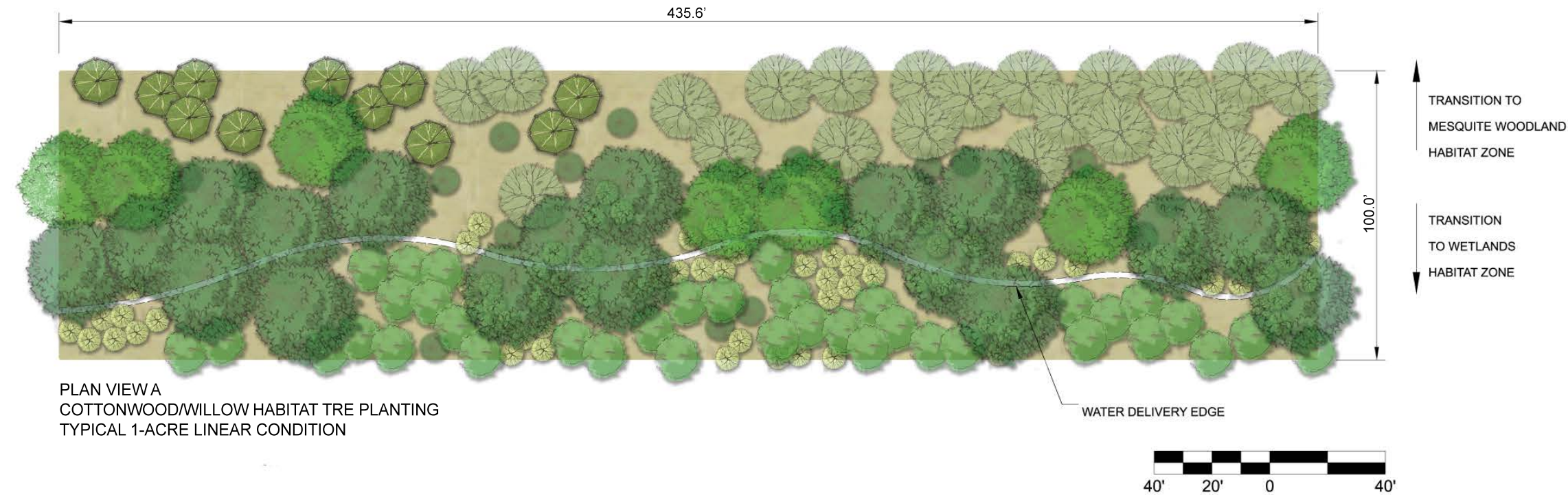
SHRUB SCHEDULE (SHRUB SYMBOLS NOT SHOWN)

BOTANICAL NAME	COMMON NAME
ATRIPLEX CANESCENS	FOUR WING SALTBRUSH
CELTIS RETICULATA	NET-LEAF HACKBERRY
HYMENOCLEA MONOGYRA	BURROBUSH
HYMENOCLEA SALSOTA	BURROBUSH
PLUCHEA SERICEA	ARROWWEED
SALIX EXIGUA	SANDBAR WILLOW

THE COTTONWOOD/WILLOW HABITAT TREE PLANTING MODULE DEPICTED ON THIS LAYOUT REPRESENTS A TYPICAL ONE-ACRE TREE DENSITY OF A LINEAR COTTONWOOD/WILLOW HABITAT ZONE. THIS MODULE SCENARIO SHOWS A TRANSITION FROM A WETLANDS HABITAT ZONE TO A MESQUITE WOODLANDS HABITAT ZONE. IN A NON-TRANSITIONAL AREA, THE MESQUITE TREE QUANTITIES WOULD BE REPLACED BY COTTONWOOD TREES. GOODING'S WILLOW AND SEEP WILLOW WOULD ALSO OCCUR IN GREATER DENSITY IN A NON-TRANSITIONAL COTTONWOOD/WILLOW AREA.

FORBS/GRASSES SCHEDULE (FORBS/GRASSES SYMBOLS NOT SHOWN- SHALL BE INCLUDED AS A SEED MIX)

BOTANICAL NAME	COMMON NAME	BOTANICAL NAME	COMMON NAME	BOTANICAL NAME	COMMON NAME	BOTANICAL NAME	COMMON NAME
AMBROSIA AMBROSIOIDES	CANYON RAGWEED	CLEMATIS DRUMMONDII	VIRGIN'S BOWER	HORDEUM ARIZONICUM	ARIZONA BARLEY	MUHLENBERGIA RIGENS	DEER GRASS
AMSINCKIA TESSELLATA	FIDDLE-NECK	CYPERUS ODORATUS	SEDGE	JUNCUS BUFONIUS	RUSH	PHRAGMITES COMMUNIS	REED
ANEMOPSIS CALIFORNICA	YERBA MANSA	DATURA WRIGHTII	DATURA	LOTUS HUMISTRATUS	DEERVETCH	PLATYSTEMON CALIFORNICUS	CREAM-CUPS
ARISTIDA ADSCENSIONIS	SIX-WEEK THREE AWN	DISTICHLIS SPICATA	SALT GRASS	LOTUS SALSUGINOSUS	DEERVETCH	SPOROBOLUS AIROIDES	ALKALI SACATON
ARISTIDA PURPUREA	PURPLE THREE AWN	ELYMUS GLAUCUS	WILD-RYE	MARAH GILENSIS	VINE (WILD) CUCUMBER		
BROMUS ARIZONICUS	ARIZONA BROME	FILAGO SPECIES	FILAGO	MIMULUS GUTTATUS	YELLOW MONKEYFLOWER		
CLEOME LUTEA	SPIDER-FLOWER	GNAPHALIUM PALUSTRE	CUDWEED	MIMULUS PILOSUS	MONKEYFLOWER		



Typical cottonwood/willow planting plan for floodway fringe areas. Any existing or proposed vegetation within the floodway shall be in compliance with the FCDMC El Rio Vegetation Management Plan, Lower Gila River, Maricopa County AZ.

Mesquite Woodland Habitat

The mesquite woodland habitat plant palette can provide a floodway fringe habitat that serves as a transition between the cottonwood/ willow habitat and a more xeric habitat. This habitat and its associated species harbors a diversity of very xeric type plantings. It offers the opportunity to serve as a common planting theme for those areas that transition to a more water intensive landscape treatment. As with wetland and cottonwood/ willow, this plant habitat implementation could occur or be part of a floodway fringe landscape that is focused on the transition areas between the El Rio trail system and adjacent development. The broad spreading mesquite species and the thorny nature of this planting palette may limit the use of this habitat within a private development area to those areas of viewing and transition rather than active use. However, the plant palette provides plant diversity that can be utilized in creating a transitional plant palette for both public and private developments as there may be transition zones between the El Rio Trail corridor and public or private development where this habitat could thrive. The mesquite woodland habitat (bosques) were once quite common in the desert southwest as the primary woody cover on the upper floodplains of the river valleys and across the desert floors. This woodland was reduced in

coverage by agriculture and by the harvesting of wood products, primarily fuelwood. Mesquite seedlings and saplings can be planted to restore the majority of the sites to woodlands. These woodlands protect the soil, provide habitat for birds, especially doves, and the mesquite pods provide food for many native animals. It is noteworthy that, historically, these pods were used by native peoples in their diets. The long term goal should be to establish sustainable mesquite woodlands to serve as wildlife habitat. These bosques, consisting primarily of mesquite trees, also include a diverse understory of vegetation that provides habitat for a wide variety of species.



Landscape Guidelines





MESQUITE WOODLAND
TREE SCHEDULE

	BOTANICAL NAME	COMMON NAME	QUANTITY PER ACRE
	BACCHARIS SALICIFOLIA	SEEP WILLOW	90
	PARKINSONIA FLORIDUM	BLUE PALO VERDE	7
	CHILOPSIS LINEARIS	DESERT WILLOW	7
	POPULUS FREEMONTII	COTTONWOOD	4
	PROSOPIS PUBESCENS	SCREWBEAN MESQUITE	18
	PROSOPIS VELUTINA	VELVET MESQUITE	32
	PROSOPIS GLANDULOSA VAR. TORREYANA	HONEY MESQUITE	31
	SAMBUCUS MEXICANA	ELDERBERRY	11

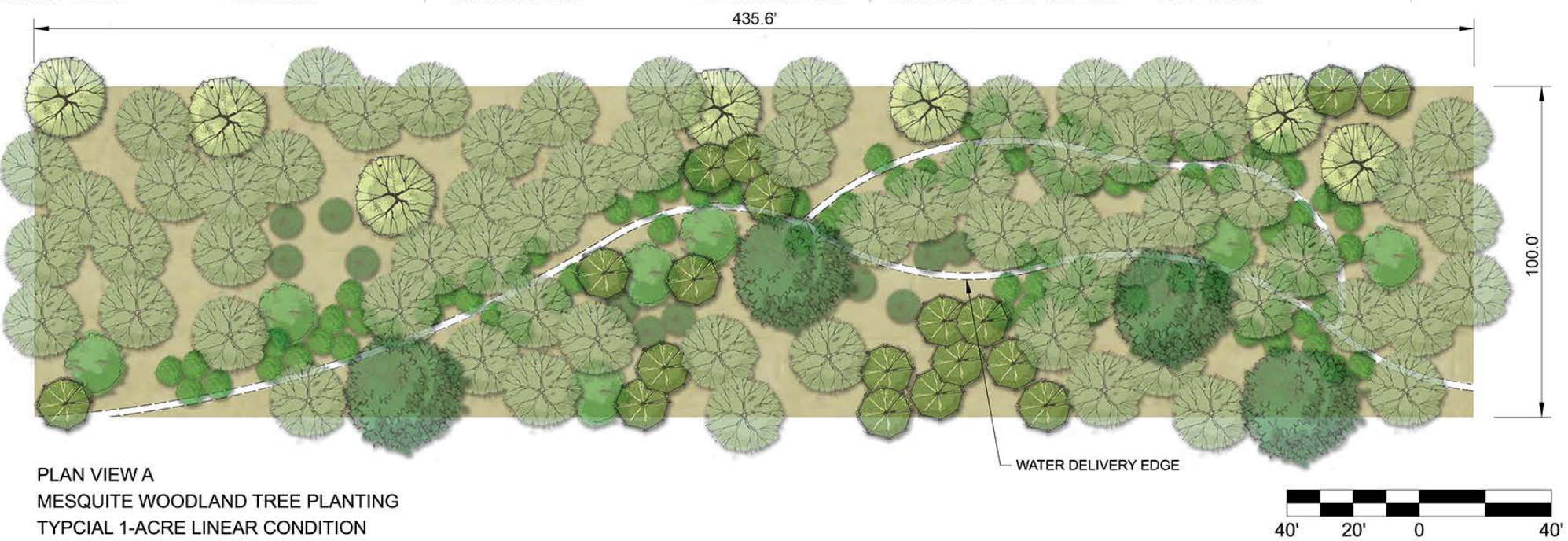
SHRUB SCHEDULE (SHRUB SYMBOLS NOT SHOWN)

BOTANICAL NAME	COMMON NAME	BOTANICAL NAME	COMMON NAME
ACACIA CONSTRICTA	WHITETHORN ACACIA	HYMENOCLEA SALSOTA	BURROBUSH
ACACIA GREGGII	CATCLAW ACACIA	HYPTIS EMORYI	DESERT LAVENDER
ATRIPLEX CANESCENS	FOUR-WING SALTBU	LYCUIM SPECIES	DESERT THORN
ATRIPLEX LENTIFORMIS	QUAILBUSH	LYCUIM FREMONTII	WOLFBERRY
CELTIS PALLIDA	DESERT HACKBERRY	PULCHEA SERICEA	ARROWWEED
CELTIS RETICULATA	NET-LEAF HACKBERRY	SPHAERALCEA AMBIGUA	DESERT MALLOW
ENCELIA FARINOSA	BRITTLEBUSH	TRIXIS CALIFORNICA	TRIXIS
HYMENOCLEA MONOGYRA	BURROBUSH	ZIZYPHUS OBTUSIFOLIA	GRAYTHORN

THE MESQUITE WOODLAND TREE PLANTING MODULE DEPICTED ON THIS LAYOUT REPRESENTS A TYPICAL ONE-ACRE TREE DENSITY OF A LINEAR MESQUITE WOODLAND ZONE. THIS MODULE SCENARIO SHOWS A MIXTURE OF MESQUITE TYPES - BOTH VELVET MESQUITE AND SCREWBEAN MESQUITES. IN A STANDARD HABITAT ZONE, HOWEVER, ONE MESQUITE WILL EXIST AS A MORE DOMINANT MESQUITE TYPE, DEPENDING ON THE SITE-SPECIFIC CONDITIONS OF A GIVEN AREA.

FORBS/GRASSES SCHEDULE (FORBS/GRASSES SYMBOLS NOT SHOWN- SHALL BE INCLUDED AS A SEED MIX)

BOTANICAL NAME	COMMON NAME	BOTANICAL NAME	COMMON NAME	BOTANICAL NAME	COMMON NAME	BOTANICAL NAME	COMMON NAME
ABRONIA VILOSA	SAND VERBENA	CLEMATIS DRUMMONDII	VIRGIN'S BOWER	JUNCUS BUFONIUS	RUSH	PANICUM OBTUSIFOLIUM	CURLY MESQUITE
ARISTIDA ADSCENSIONIS	SIX-WEEK THREE AWN	DATURA WRIGHTII	DATURA	LEPIDIUM THURBERI	PEPPERGRASS	PENSTEMON PARRYI	PARRY'S PENSTEMON
AMARANTHUS PALMERI	CARELESS WEED	DISTICHLIS SPICATA	SALT GRASS	LOTUS HUMISTRATUS	DEERVETCH	PHACELIA SPECIES	WILD HELIOTROPE
AMSINCKIA TESSELLATA	FIDDLE-NECK	EMMENANTHE PENDULIFLORA	WHISPERING BELLS	LOTUS SALSUGINOSUS	DEERVETCH	PLEURAPHIS RIGIDA	BIG GALLET
ARISTOLOCHIA WATSONI	INDIAN-ROOT	ERIOGONUM INFLATUM	DESERT TRUMPET	LUPINUS ARIZONICUS	LUPINE	POA BIGELOVII	BLUEGRASS
BAILEYA MULTIRADIATA	DESERT MARIGOLD	ERIONEURON PULCHELLUM	FLUFF GRASS	MUHLENBERGIA MICROSPERMA	ANNUAL MUHLY	PSILOTRYPHE COOPERI	PAPER FLOWER
BOUTELOUA CURTIPENDULA	SIDE-OAT GRAMA	ESCHSCHOLZIA MEXICANA	MEXICAN POPPY	MUHLENBERGIA PORTERI	DEERGRASS	SALVIA COLUMBARI	CHIA
BOUTELOUA GRACILIS	BLUE-GRAMA	FESTUCA ARIZONICA	FESCUE	OENOTHERA DELTOIDES	EVENING PRIMROSE	SENECIO LEMMONII	GROUNDSEL
BROMUS ARIZONICUS	ARIZONA BROME	FESTUCA PACIFICA	FESCUE	OPUNTIA SPINOSIOR	CANE CHOLLA	SPOROBOLUS AIROIDES	ALKALI SACATON
CAMMISONIA SPECIES	SUNCUPS	FILAGO SPECIES	FILAGO	OPUNTIA ENGELMANNII	ENGLEMANN'S PRICKLY PEAR	VERBESINA ENCELOIDES	COWPEN DAISY
CHAENACTIS SPECIES	PINCUSHION	GEREA CANESCENS	DESERT SUNFLOWER	ORTHOCARPUS PURPURASCENS	OWL'S CLOVER		



PLAN VIEW A
MESQUITE WOODLAND TREE PLANTING
TYPICAL 1-ACRE LINEAR CONDITION
Typical mesquite woodland planting plan for floodway fringe areas. Any existing or proposed vegetation within the floodway shall be in compliance with the FCDMC El Rio Vegetation Management Plan, Lower Gila River, Maricopa County AZ.

Lower Sonoran Habitat

The lower Sonoran habitat plant palette is very much related to the mesquite woodland habitat and completes the transition in a floodway fringe habitat from wettest to the more xeric habitat. This habitat and its associated species provide a diversity of very xeric type plantings. It offers the opportunity to serve as a common planting theme for those floodway fringe areas where a dryer more desert approach is applicable. As with the other habitats presented, this plant habitat implementation could occur as part of a landscape that is focused on some of the transition areas between the El Rio Trail system and adjacent development. The color of the palo verde and ironwood species and the thorny nature of this planting palette may limit the use of this habitat within a private development area to those areas of viewing and transition rather than active use. However, the plant palette provides plant diversity that can be utilized in a streetscape, creating a transitional plant palette for both public and private developments as there may be transition zones between the El Rio Trail corridor and public or private development where this habitat could thrive.

The inclusion of the lower Sonoran plant habitat represents a part of the Great American Desert of western North America, extending from the northern part of the United States deep into Mexico, a nearly continuous continental arid region separated from the Pacific Ocean and the Gulf of Mexico except in the states of Sonora and Baja California in northwestern



Mexico. This region contains over 3000 different plant species. We have taken the phrase lower Sonoran to define the habitat that is often characteristically found just beyond the mesquite woodland and bosque habitats and tends to be a drier, more xeric condition. The planting concept for any lower Sonoran planting in a floodway fringe area would be characterized by palo verde and mesquite species with the occasional punctuation of a desert ironwood. The shrub and understory planting that should be placed by a seed mix within this habitat have a very wide variety of plants that would thrive in these more xeric conditions.



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LOWER SONORAN
TREE SCHEDULE

	BOTANICAL NAME	COMMON NAME	QUANTITY PER ACRE
	PARKINSONIA FLORIDUM	BLUE PALO VERDE	7
	PARKINSONIA MICROPHYLLUM	LITTLE LEAF PALO VERDE	11
	OLNEYA TESOTA	IRONWOOD	7
	PROSOPIS PUBESCENS	SCREWBEAN MESQUITE	11
	PROSOPIS VELUTINA	VELVET MESQUITE	7

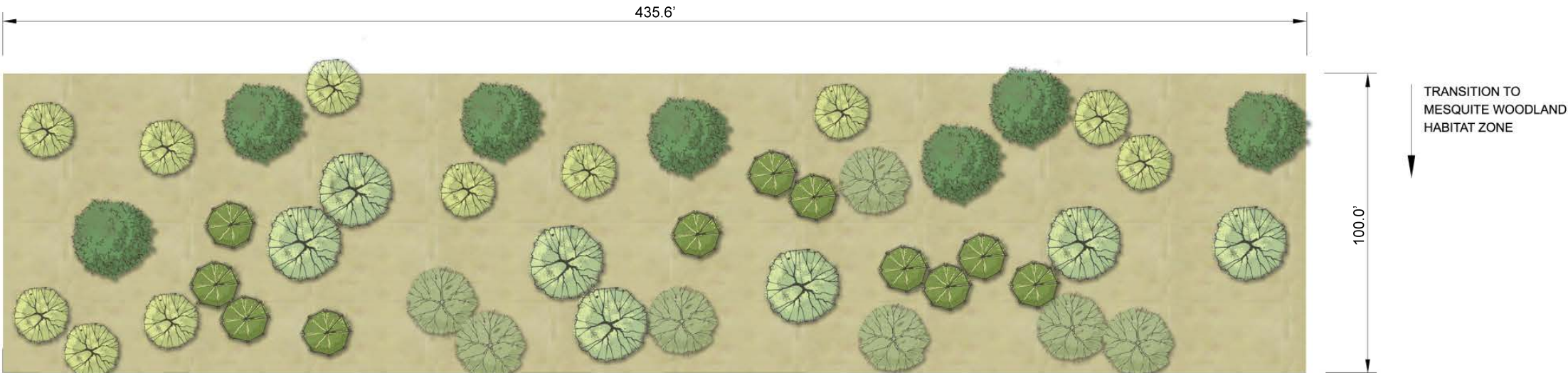
SHRUB SCHEDULE (SHRUB SYMBOLS NOT SHOWN)

BOTANICAL NAME	COMMON NAME	BOTANICAL NAME	COMMON NAME	BOTANICAL NAME	COMMON NAME
ACACIA CONSTRICTA	WHITETHORN ACACIA	FOUQUIERIA SPLENDENS	OCOTILLO	OPUNTIA ENGELMANNII	ENGELMANN'S PRICKLY PEAR
ACACIA GREGGII	CATCLAW ACACIA	JUSTICIA CALIFORNICA	CHUPAROSA	OPUNTIA FULGIDA	CHAIN-FRUIT CHOLLA
AGAVE CHRYSACANTHA	GOLDEN FLOWER AGAVE	LARREA TRIDENTATA	CREOSOTE	OPUNTIA LEPTOCAULIS	DESERT CHRISTMAS CACTUS
AMBROSIA DUMOSA	WHITE BURSAGE	LOTUS RIGIDUS	DESERT ROCK PEA	SIMMONDSIA CHINENSIS	JOJOBA
ATRIPLEX CANESCENS	FOUR-WING SALTBU	LYCUIM EXSERTUM	DESERT THORN	SPHAERALCEA AMBIGUA	GLOBEMALLOW
ATRIPLEX LENTIFORMIS	QUAILBUSH	MIRABILIS BIGLOVII	FOUR-O-CLOCK	TRIXIS CALIFORNICA	TRIXIS
CALLIANDRA ERIOPHYLLA	NATIVE FAIRY DUSTER	OPUNTIA ACANTHOCARPA	BUCKHORN CHOLLA	VIGUIERA PARISHII	GOLDENEYE
SENNA COVESII	DESERT CASSIA	OPUNTIA BASILARIS	BEAVERTAIL CACTUS	YUCCA BACCATA	BANANA YUCCA
CELTIS PALLIDA	DESERT HACKBERRY	OPUNTIA BIGLOVII	TEDDY BEAR CHOLLA	ZIZYPHUS OBTUSIFOLIA	LOTEBUSH
ENCELIA FARINOSA	BRITTLEBUSH	OPUNTIA CHLOROTICA	PANCAKE PEAR		

FORBS/GRASSES SCHEDULE (FORBS/GRASSES SYMBOLS NOT SHOWN- SHALL BE INCLUDED AS A SEED MIX)

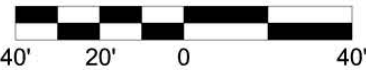
BOTANICAL NAME	COMMON NAME	BOTANICAL NAME	COMMON NAME	BOTANICAL NAME	COMMON NAME
ACACIA CONSTRICTA	WHITETHORN ACACIA	ENCELIA FARINOSA	BRITTLEBUSH	SIMMONDSIA CHINENSIS	JOJOBA
ACACIA GREGGII	CATCLAW ACACIA	LARREA TRIDENTATA	CREOSOTE	SPHAERALCEA AMBIGUA	DESERT MALLOW
AMBROSIA DUMOSA	BURSAGE	LYCIUM EXSERTUM	DESERT THORN	ZIZYPHUS OBTUSIFOLIA	LOTEBUSH
ATRIPLEX CANESCENS	FOUR-WING SALTBU	OLNEYA TESOTA	IRONWOOD		
ATRIPLEX LENTIFORMIS	QUAILBUSH	OPUNTIA ACANTHOCARPA	BUCKHORN CHOLLA		
BOUTELOUA CURTIPENDULA	SIDE-OAT GRAMA	OPUNTIA BASILARIS	BEAVERTAIL CACTUS		
CALLIANDRA ERIOPHYLLA	FAIRY DUSTER	OPUNTIA ENGELMANNII	ENGELMANN'S PRICKLY PEAR		
SENNA COVESII	DESERT CASSIA	PHACELIA CREMULATA	WILD HELIOTROPE		
CELTIS PALLIDA	DESERT HACKBERRY	PROSOPIS PUBESCENS	SCREWBEAN MESQUITE		
PARKINSONIA FLORIDUM	BLUE PALO VERDE	PROSOPIS VELUTINA	VELVET MESQUITE		

THE LOWER SONORAN TREE PLANTING
MODULE DEPICTED ON THIS LAYOUT
REPRESENTS A TYPICAL ONE-ACRE TREE
DENSITY OF A LINEAR UPPER SONORAN
ZONE.



PLAN VIEW A
LOWER SONORAN TREE PLANTING
TYPICAL 1-ACRE LINEAR CONDITION

Typical lower sonoran planting plan for floodway fringe areas. Any existing or proposed vegetation within the floodway shall be in compliance with the FCDMC El Rio Vegetation Management Plan, Lower Gila River, Maricopa County AZ.

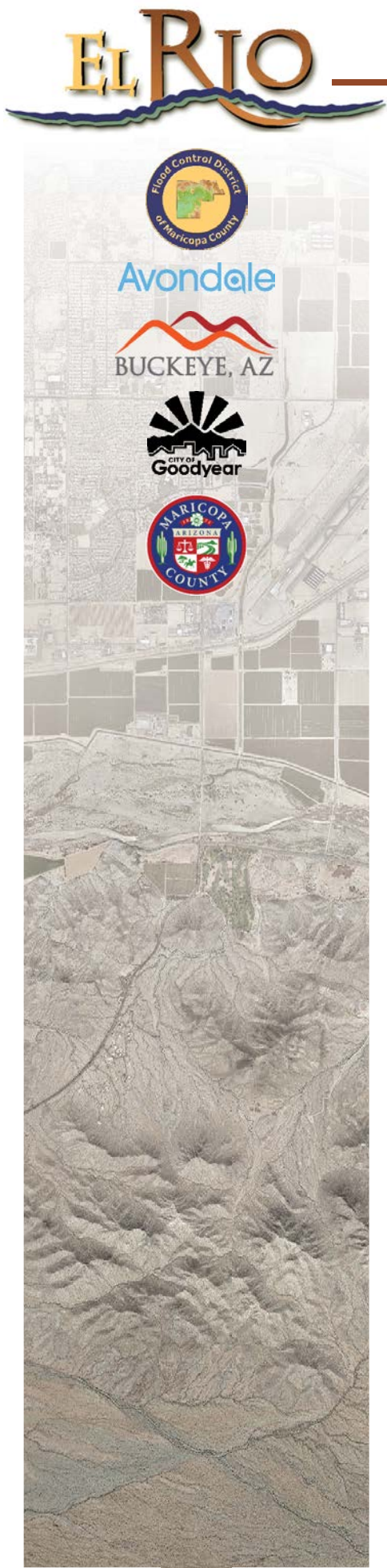




Transition Zone Habitat

The floodway fringe transition zone planting design offers a great deal of flexibility when evaluating its use adjacent to existing or proposed private development. The transition zone planting layout has been created to facilitate the gradual transition from either public or private development areas that may have had a focus on a higher water use, less native plant palette, to the more xeric and native river corridor planting design associated with the Gila River. The floodway fringe transition zone plant materials are shown to include a mixture of both native and non-native low water use species. The guidelines were developed to allow the use of more non-native, but desert adapted, plantings closer to any adjacent development, and as a transition to the more native desert El Rio Trail plant palette. Moving away from both the private development "Edge" and the El Rio Trail, the planting will begin to reflect a species change to more of a lower Sonoran native desert plant palette.





TRANSITION ZONE
TREE SCHEDULE

	BOTANICAL NAME	COMMON NAME	QUANTITY PER ACRE
	CHILOPSIS LINEARIS	DESERT WILLOW	5
	DAHLBERGIA SISSOO*	INDIAN ROSEWOOD	11*
	PROSOPIS HYBRID	THORNLESS MESQUITE	6
	PROSOPIS VELUTINA	VELVET MESQUITE	3
	PARKINSONIA X 'DESERT MUSEUM'	DESERT MUSEUM PALO VERDE	7
	OLNEYA TESOTA	IRONWOOD	3
	X CHITALPA TASHKENTENSIS	CHITALPA	4

*Use of this tree species near concrete slabs may require the use of root intrusion barrier

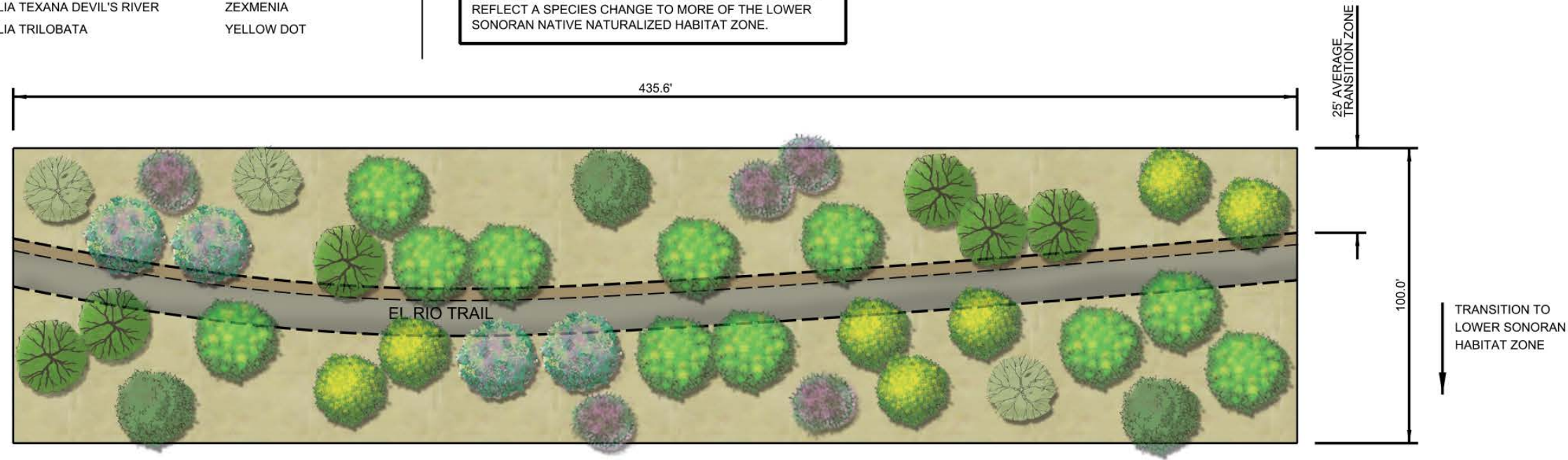
GROUNDCOVER SCHEDULE (GROUNDCOVER SYMBOLS NOT SHOWN)

BOTANICAL NAME	COMMON NAME
ACACIA REDOLENS	PROSTRATE ACACIA
CONVOLVULUS CNEORUM	BUSH MORNING GLORY
DALEA GREGGII	TRAILING INDIGO
HYMENOXYLS ACAULIS	ANGELITA DAISY
LANTANA MONTEVIDENSIS	TRAILING LANTANA
LANTANA SP. 'NEW GOLD'	NEW GOLD LANTANA
OENOTHERA BERLANDIERI	MEXICAN EVENING PRIMROSE
ROSMARINUS OFFICINALIS PROSTRATUS	PROSTRATE ROSEMARY
WEDELIA TEXANA DEVIL'S RIVER	ZEXMENIA
WEDELIA TRILOBATA	YELLOW DOT

THE TRANSITION ZONE TREE PLANTING OFFERS A GREAT DEAL OF FLEXIBILITY FOR ADJACENT DEVELOPMENT. THE TRANSITION ZONE PLANTING LAYOUT IS TO FACILITATE THE GRADUAL TRANSITION FROM PRIVATE DEVELOPMENT LANDSCAPE TO THE MORE XERIC AND NATIVE RIVER CORRIDOR PLANTING. THE SCENARIO SHOWN INCLUDES A MIXTURE OF BOTH NATIVE AND NON NATIVE SPECIES WITH A HEAVIER EMPHASIS ON THE NON NATIVE SPECIES CLOSER TO THE EL RIO TRAIL AND THE ADJACENT PRIVATE DEVELOPMENT. MOVING AWAY FROM THE PRIVATE DEVELOPMENT EDGE AND THE TRAIL THE TRANSITION ZONE PLANTING WOULD REFLECT A SPECIES CHANGE TO MORE OF THE LOWER SONORAN NATIVE NATURALIZED HABITAT ZONE.

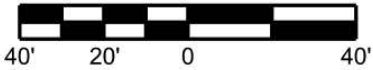
SHRUB & ACCENT SCHEDULE (SHRUB/ACCENT SYMBOLS NOT SHOWN)

BOTANICAL NAME	COMMON NAME	BOTANICAL NAME	COMMON NAME	BOTANICAL NAME	COMMON NAME
AGAVE SP.	AGAVE	FOUQUIERIA SPLENDENS	OCOTILLO	TECOMA SP.	TECOMA SPECIES
ASCLEPIAS SUBULATA	DESERT MILKWEED	JUSTICIA CALIFORNICA	CHUPAROSA	YUCCA SP.	YUCCA
BAILEYA MULTIRADIATA	DESERT MARIGOLD	LARREA TRIDENTATA	CREOSOTE		
BOUGAINVILLEA VAR.	BUSH BOUGAINVILLEA	LEUCOPHYLLUM SP.	TEXAS SAGE		
BOUTELOUA GRACILIS	BLUE GRAMMA GRASS	MUHLENBERGIA SP.	GRASS SPECIES		
CALLIANDRA ERIOPHYLLA	PINK FAIRY DUSTER	OPUNTIA ACANTHOCARPA	BUCKHORN CHOLLA		
DASYLIRION LONGISSIMUM	MEXICAN GRASS TREE	OPUNTIA ENGELMANNII	ENGELMANN'S PRICKLY PEAR		
DASYLIRION WHEELERI	DESERT SPOON	PENSTEMON PARRYI	PENSTEMON		
DODONEA VISCOSA	HOPBUSH	SIMMONDSIA CHINENSIS	JOJOBA		
ENCELIA FARINOSA	BRITTLEBUSH	SPHAERALCEA AMBIGUA	GLOBEMALLOW		



PLAN VIEW A
TRANSITION ZONE TREE PLANTING
TYPICAL 1-ACRE LINEAR CONDITION

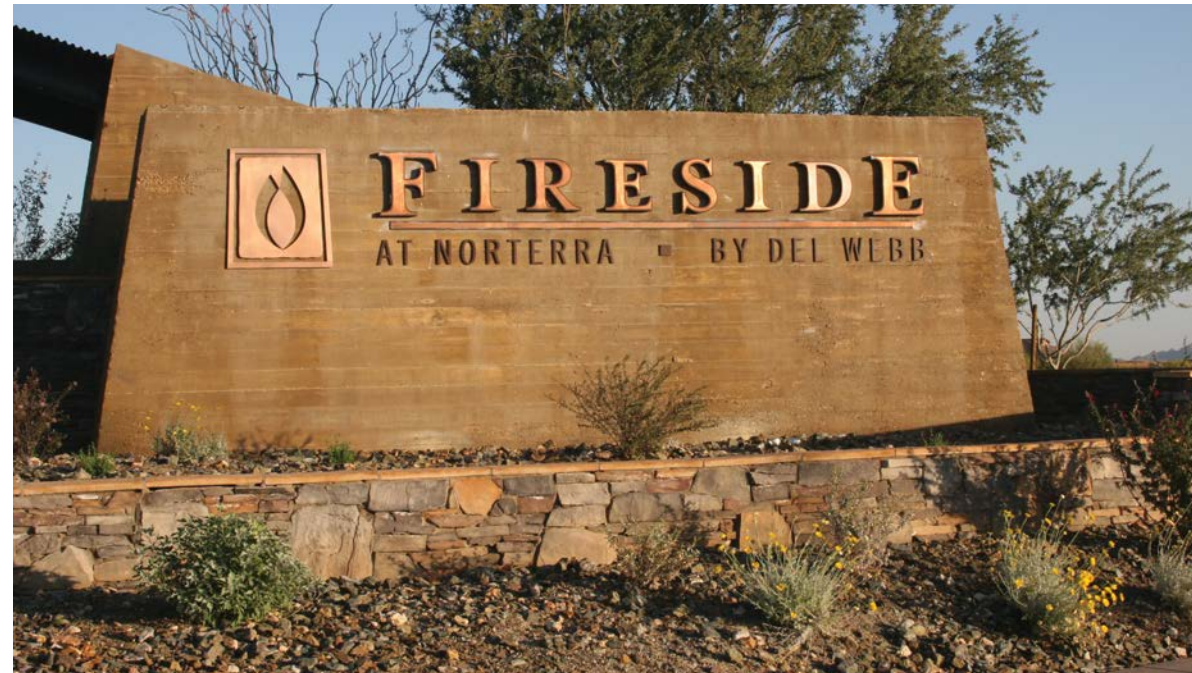
Typical transitional zone tree planting plan for floodway fringe areas. Any existing or proposed vegetation within the floodway shall be in compliance with the FCDMC El Rio Vegetation Management Plan, Lower Gila River, Maricopa County AZ.



Beyond the Planting Palettes

The aesthetic for the El Rio plan includes the use of native plant materials as transitional design features to the more traditional private development design. This aspect of the El Rio Design Guidelines and Planning Standards should be fine-tuned by each public entity reviewing any proposal considering designs at a detailed level of creativity and evaluated on a case-by-case basis. This would be the arena that would include selecting colors, materials, and textures that will complement and work with the more native plant palette that defines El Rio. The aesthetics also help to define and give substance to the style complementing the objects that make up the design theme as depicted in the signage and graphics described within this report. The elements most often found in association with a streetscape and or in the areas transitioning between private development and the El Rio Trail may include the following elements.

View Walls – These can be used between the El Rio Trail and the “Edge” as defined earlier in this section. Walls can also be incorporated into medians and streetscape designs to provide vertical separation between traffic lanes. Walls can provide a variety of unique vertical surfaces that can help to accentuate the overall El Rio aesthetic and theme. In addition, walls can be used as artistic elements in the landscape that can be accentuated at night though the use of energy efficient lighting systems. The walls should capitalize on the aesthetic vocabulary established



in the signage section of this report accentuating the use of unfinished board and batten concrete walls along with river run rock as accent features in, and associated with, any wall. Utilizing a wall in a median will require close scrutiny by the reviewing agency on the overall width of any median and visibility triangles so that a wall can be safely included in a design. The use of walls in a streetscape right-of-way is encouraged to support and supplement the overall aesthetic and El Rio theme but will be dependent upon the setting and location of the streetscape and any city requirements. Any walls associated with El Rio can provide low screening, block undesirable views, or provide visual interest where there may be the tendency for monotonous uniformity. The walls for El Rio could include but not be limited to their use as:

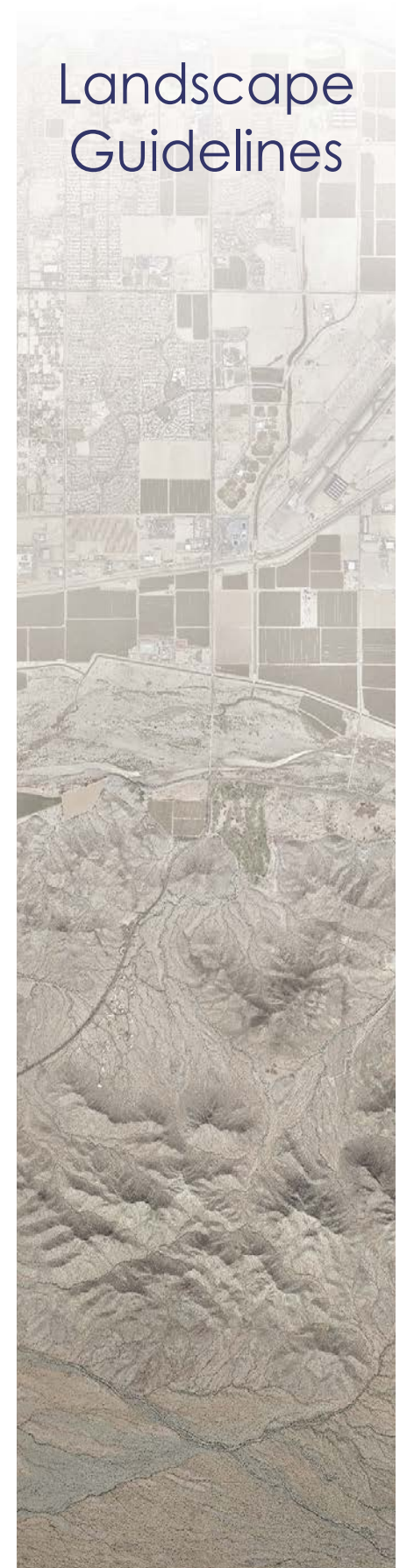
1. Subdivision walls

2. Intersection Enhancement
3. Screening of utilities and service equipment areas
4. Enhance areas of pedestrian activity
5. Combine with seating or act as seat walls
6. Separate and/or protect sidewalks from lanes of traffic
7. Vertical surfaces along the right-of-way that could be opportunities for business identification or residential signage
8. Walls next to seating or pedestrian activity areas that become posting areas for local news and area events
9. Commercial/Retail entries
10. Subdivision signs
11. Public facility entrances



Architectural sculpture elements – The El Rio theme, as described earlier in this report, is built upon respecting the unique archeological record and history of this area while respecting the branding and logo previously completed. The use and introduction of any architectural and or sculptural elements should build from the theme and only be allowed and concentrated in areas of heavy use and visual prominence. These areas include, but are not limited to: intersections, trailheads, public seating areas, bridge crossings of the Gila River, and city identified gateways. They can be incorporated into streetscape amenities, like bus stops, or become stand-alone focal points for public art displays, but should have an aesthetic that is in keeping with the theme and signage standards developed within this report. Any artistic expressions, either integrated into the streetscape elements or as individual artist's creations, can enrich the experience of

Landscape Guidelines





public spaces and can mark or signal El Rio as a unique and special environment.

Streetscape and Median Planting – The development of streetscape and median plantings to complement either public right-of-way or private development will be dependent upon the classification of the street and the overall width and dimension of any associated right-of-way and median area. In general, if there are landscape areas and medians within the El Rio Design Guidelines and Planning Standards, they should complement and reflect the importance of water storage and conveyance in every aspect of their design. This can be achieved by making adjacent landscape areas and medians recessed below adjacent sidewalk and pavement grades. The use of bioretention, bioinfiltration cells, and working with the roadway design team to incorporate curb inlets into the landscape areas including the median to serve as first flush water capture, are all critical elements that can demonstrate the importance of water in our desert environment. The depth and extent of these bioswales and first-flush basins in a landscape area or median will depend on the street designation of each

respective city, the right-of-way available and the median width. The medians and landscape areas should display a planting palette that emphasizes the desert and low water use adapted selections that are shown in the earlier plant palettes. The densities of these plantings would be dictated by available area, but would emphasize, as a minimum target, 80% native/low water use adapted plantings done en masse, with 20% allowed for specialty plantings to accentuate entries, intersections of importance or other specialty areas designated or allowed by the local municipality.

As guiding principles associated with any street work in the El Rio Design Guidelines and Planning Standards the street designs should embrace the principles and concepts of "Complete Streets", "Green Streets" and "Low Impact Development (LID)". Information on these concepts and principles of design is vast, and growing rapidly, but as a starting point, information on these approaches can be found at the following web sites:

<http://nacto.org/usdg/>

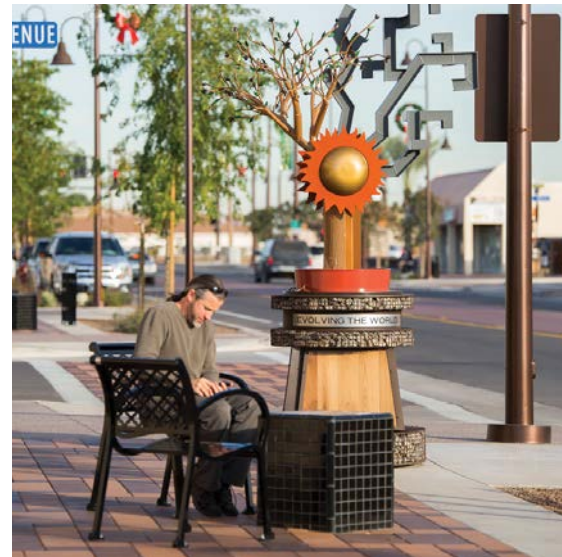


<http://www.smartgrowthamerica.org/complete-streets>

<http://www.mesaaz.gov/home/showdocument?id=12724>

Gateways – There are numerous areas and points of interest that would allow for the creation of a gateway statement in helping to create a sense of place and entry to the El Rio area. These potential gateway areas include river bridges and intersections as two of the best opportunities to celebrate the area and the unique environment that is El Rio. If a particular intersection is chosen by a municipality to serve as an El Rio gateway statement, the entire interchange (all four corners) shall be included. The significance of the gateway treatment at the selected intersection should include the use of El Rio themed elements as described in this project. It should be reflected in every element including but not limited to: pavement design, crosswalks, signage, walls, public art, landforms, seating,

Landscape Guidelines



planting design and lighting. The gateways are meant to be large presentations that signify the importance of the area and clarify the linkage to the El Rio corridor.

Ground Plane Treatments - The ground plane materials used throughout the El Rio area help to define the area's overall look and feel. The ground plane treatment in all locations associated with the El Rio area should be a "Desert Pavement" material of native stone. Desert pavement is a feature consisting of closely packed clasts (rock fragments) of varying sizes, lying in a layer displaying different tones relative to the desert varnish layer that has accumulated on the exposed surface of the naturally occurring rock. Desert pavement shall be native, local, desert granite stone at the size shown below and color specified by each local municipality. However, earth tones of deep browns and deep reds are suggested in keeping with the colors from the surrounding mountain ranges and theme of the El Rio Design Guidelines and Planning Standards. The desert pavement

shall be from a single source, free from coating, clay, caliche or organic matter. A five pound (5lb) sample of material of

Desert Pavement	
Sieve	%Ret.
4"	1
3"	14
2"	11
1-1/2"	20
1-1/4"	19
1"	21
3/4"	27
1/2"	30
3/8"	35
1/4"	41
#4	49
#8	57
#10	11
#16	14
#30	15
#40	17
#50	18.5
#100	21
#200	26

desert pavement shall be provided for approval by each respective city before initiating any installation. The size/gradation is meant to mimic the native desert pavement of the surrounding undisturbed desert and should at a minimum consist of the following gradation:

Amenities - The amenities associated with the El Rio corridor and the associated linkages out into the surrounding communities include, but are not limited to: benches, lighting, trash receptacles, and bike racks. Such resources provide functional convenience for all users. And, though serving a functional purpose, these amenities offer the opportunity to integrate art and icon elements into the design, and to select shape, finish, and visual accents that will showcase links to the overall theme and reinforce the design theme through their structural elements, materials and colors. The El Rio themes, as stated earlier in this document, need to

build upon and grow out of the theming guidelines. Each city will have to interpret these theming guidelines to determine how it will be applied and what El Rio material vocabulary would best reflect each city's El Rio aesthetic.

The landscape design guidelines that have been presented were developed to be non-regulative, but have been provided to describe the design philosophy for planting and site amenities within, and associated with, the El Rio Design Guidelines and Planning Standards. These landscape guidelines, along with their supporting graphics, were developed to illustrate the importance of the El Rio goals, themes and design philosophy. All design elements, landscape decisions and site amenities should be clearly connected to, and reflective of, the El Rio Design Guidelines and Planning Standards.