

TECHNICAL NOTES

COMMON ARIZONA RIPARIAN PLANTS

TOE ZONE: Grass-like plants – Frequent Inundation

| Common Name | Scientific Name | Growth Form | Elevation & Habitat | Zones of Adaptation (MLRA's) |
|--------------------------------|---|-------------|---|------------------------------|
| Sedges | <i>Carex</i> species | Grass-like | Typically found above 5,000 feet but some species found down to 3,000 feet. Zones with saturated soils subject to periodic short-term inundation of 1 to 18 inches. | 35, 38, 39, 41 |
| Spikerush | <i>Eleocharis</i> species | Grass-like | Elevations from 150 to 9,000 ft. Wet areas, streams, ponds, lakes. Zones with occasional droughty soil conditions to saturated soils subject to periodic short-term inundation of 1 to 18 inches. | 30, 35, 38, 39, 40, 41 |
| Bulrushes (Sedge family) | <i>Scirpus californicus</i> , <i>S. maritimus</i> , <i>S. pungens</i> | Grass-like | Elevations from near sea level to 9,000 ft. Meadows, ponds, and streams with standing water, up to 6 inches deep. Often in alkaline areas. | 30, 35, 38, 39, 40, 41 |
| Cattails (Narrowleaf & Common) | <i>Typha angustifolia</i> & <i>T. latifolia</i> | Grass-like | Elevations from 1,000 to 7,500. Marshes, streams, and ponds with standing water, up to 12 inches deep. Common cattail (<i>T. latifolia</i>) can be weedy. | 35, 38, 39, 40, 41 |
| Rushes | <i>Juncus</i> spp. | Grass-like | Elevations from near sea level to 9,500 feet. Moist areas, meadows, streambanks, and shorelines with saturated soils and up to 2 inches of standing water. | 30, 35, 38, 39, 40, 41 |

The toe zone is the zone that is located below the average water elevation or the baseflow. The baseflow is that level where there is flow all summer long. Generally, this is the zone of highest stresses and the most erosion because streamflow velocities are constantly scouring the banks and bed movement is at its highest. This zone is critical to successful treatment of streambank erosion but is often the hardest to stabilize. Woody species are very difficult to establish here because of this inundation. Wetland plants like cattails (*Typha*) and bulrush (*Scirpus*) can be established in the toe zone. However, these wetland plants do not establish or survive well in areas where velocities are high. They are generally found in low energy streams or areas such as backwaters and protected corners (Hoag, et al., 2001).

Irrigation is typically not required in the toe zone, except at planting time, because the soils are either wet or inundated within 6 inches of the soil surface most of the year.

BANK ZONE: Shrubs & Grasses – Periodic Inundation

| Common Name | Scientific Name | Growth Form | Elevation & Habitat | Zones of Adaptation (MLRA's) |
|--|--|-------------------------|--|------------------------------|
| Seep Willow (Mule Fat, batamote, water-wally) | <i>Baccharis salicifolia</i> (<i>B. glutinosa</i>) | Shrub (thicket forming) | Up to 5,500 ft but usually lower. Mohave, Greenlee, Graham, Cochise, Santa Cruz, Pima, La Paz and Yuma counties. | 30, 38, 40, 41 |
| Coyote Willow (Narrowleaf, Sandbar, Basket Willow) | <i>Salix exigua</i> | Creeping type shrub | Sea level to 7,000 ft. On moist sandy soils of streams in deserts, grasslands, pinyon-juniper & oak woodlands, lower Ponderosa pine forests. | 30, 35, 38, 39, 40, 41 |
| Alkali Muhly (Scratchgrass) | <i>Muhlenbergia asperifolia</i> | Grass (sod) | Moist, often alkaline, soils along streambanks. Apache, Navajo, Coconino, Yavapai, Maricopa, Pima, Cochise, and Mohave counties. | 30, 35, 40, 41 |
| Desert (Inland) Saltgrass | <i>Distichlis spicata</i> | Grass (sod) | Moist saline or alkaline soils along streams or springs. From sea level to 6,000 ft. Apache, Navajo, Coconino, Pinal, Yuma, La Paz, Cochise and Pima counties. | 30, 35, 40, 41 |

The bank zone is the area between the average water elevation and the bankfull discharge elevation. It is less erosive than the toe zone. It will be exposed to erosive river currents, wind generated waves, wet and dry cycles, freezing or thawing cycles, ice scour and debris deposition during the cold weather and/or high flows. The bank zone will generally be vegetated with early seral or colonizing herbaceous species, flexible stemmed willows, and low shrub species. This zone will be inundated far less frequently than the toe zone. Soil moisture levels in this zone will be much lower after spring runoff and fall rains (Hoag, et al., 2001).

Irrigation is typically not required in the bank zone, except at planting time, because the soils are either wet or inundated within 6 inches of the soil surface most of the year.

OVERBANK/FLOODPLAIN ZONE: Shrubs, Trees & Grasses – Occasional Inundation

| Common Name | Scientific Name | Growth Form | Elevation & Habitat | MLRA's & Precipitation Zones ¹ |
|---|--|-------------------------|--|--|
| Seep Willow (Mule Fat, batamote, water-wally) | <i>Baccharis salicifolia</i> (<i>B. glutinosa</i>) | Shrub (thicket forming) | Up to 5,500 ft but usually lower. Mohave, Greenlee, Graham, Cochise, Santa Cruz, Pima, La Paz and Yuma counties. | 30 = 2 – 11” 38 = 12 – 18” 40 = 7 – 12” 41 = 8 – 20” |
| Arrow-weed | <i>Pluchea sericea</i> | Shrub | Throughout most of Arizona up to 3,000 ft. Along streams and in moist (sometimes saline) soils. | 30 = 2 – 11” 40 = 7 – 12” |
| Coyote Willow (Narrowleaf, Sandbar, or Basket Willow) | <i>Salix exigua</i> | Creeping type shrub | Sea level to 7,000 ft. On moist sandy soils of streams in deserts, grasslands, pinyon-juniper & oak woodlands, lower Ponderosa pine forests. | 30 = 2 – 11” 35 = 6 – 14” 38 = 12 - 18” 39 = 14 – 25” 40 = 7 – 12” 41 = 8 – 20” |

OVERBANK/FLOODPLAIN ZONE: Shrubs, Trees & Grasses – Occasional Inundation (cont'd)

| Common Name | Scientific Name | Growth Form | Elevation & Habitat | MLRA's & Precipitation Zones¹ |
|------------------------------|----------------------------------|--------------------|--|--|
| Red Willow | <i>Salix laevigata</i> | Tree / Shrub | 1,800 to 5,000 ft. Streams of oak, pinyon-juniper woodlands and deserts. | 35 = 6 – 14” 38 = 12 - 18” 39 = 14 – 25” 40 = 7 – 12” 41 = 8 – 20” |
| Goodding or Black Willow | <i>Salix gooddingii</i> | Tree | 150 to 5,000 ft. Steams of desert, desert grassland, and oak woodland. | 30 = 2 – 11” 35 = 6 – 14” 38 = 12 - 18” 39 = 14 – 25” 40 = 7 – 12” 41 = 8 – 20” |
| Arroyo Willow (White Willow) | <i>Salix lasiolepis</i> | Shrub / Tree | 6,000 to 7,000 ft. Mountains streams of eastern AZ from Cochise and Pima Counties to Apache & Coconino Counties | 35 = 6 – 14” 38 = 12 - 18” 39 = 14 – 25” 41 = 8 – 20” |
| Mexican (Blue) Elderberry | <i>Sambucus nigra (mexicana)</i> | Shrub / Tree | 1,200 to 5,000 feet along streams and arroyos in desert and desert grasslands. Cochise, Santa Cruz, Pima, Gila, Yavapai and Mohave counties. | 40 = 7 – 12” 41 = 8 – 20” |
| Arizona Sycamore | <i>Platanus wrightii</i> | Tree | 2,000 to 6,000 ft. Along streams & canyons in upper desert, desert grassland, & oak woodlands. | 38 = 12 - 18” 39 = 14 – 25” 41 = 8 – 20” |
| Fremont Cottonwood | <i>Populus fremontii</i> | Tree | 150 to 6,000 ft. along streams in AZ. | 30 = 2 – 11” 35 = 6 – 14” 38 = 12 - 18” 39 = 14 – 25” 40 = 7 – 12” 41 = 8 – 20” |
| Narrowleaf Cottonwood | <i>Populus angustifolia</i> | Tree | 5,000 to 7,000 ft. Along mountain streams in Ponderosa Pine and Pinyon-Juniper Woodlands | 38 = 12 - 18” 39 = 14 – 25” |
| Arizona (velvet) Ash | <i>Fraxinus velutinia</i> | Tree | 2,500 to 7,000 ft. along streams, moist washes and canyons. Cochise, Apache, Santa Cruz, Pima, Coconino, and Yavapai counties. | 35 = 6 – 14” 38 = 12 - 18” 39 = 14 – 25” 40 = 7 – 12” 41 = 8 – 20” |
| Arizona Boxelder | <i>Acer negundo</i> | Tree | 4,000 to 8,000 ft. Streams in oak woodlands & ponderosa pine forests | 39 = 14 – 25” 41 = 8 – 20” |
| Arizona Black Walnut | <i>Juglans major</i> | Tree | 3,500 to 7,000 ft. Along streams & canyons in the upper desert, desert grasslands, and oak woodlands. | 35 = 6 – 14” 38 = 12 - 18” 39 = 14 – 25” 41 = 8 – 20” |
| Netleaf Hackberry | <i>Celtis laevigata</i> | Tree | 2,500 to 6,000 ft. Mountains and streams throughout most of Arizona. | 38 = 12 - 18” 39 = 14 – 25” 41 = 8 – 20” |

OVERBANK/FLOODPLAIN ZONE: Shrubs, Trees & Grasses – Occasional Inundation (cont'd)

| Common Name | Scientific Name | Growth Form | Elevation & Habitat | MLRA's & Precipitation Zones ¹ |
|-------------------------------|-----------------------------|------------------------|---|---|
| Velvet Mesquite | <i>Prosopis velutinia</i> | Tree | Sea level to 5,500 ft. Widespread throughout Arizona and the major drainage systems. | 30 = 2 – 11" 38 = 12 - 18" 40 = 7 – 12" 41 = 8 – 20" |
| Western Honey Mesquite | <i>Prosopis glandulosa</i> | Tree | West portion of Arizona. | 30 = 2 – 11" 40 = 7 – 12" 41 = 8 – 20" |
| Screwbean Mesquite (tornillo) | <i>Prosopis pubescens</i> | Tree / Shrub | Sea level to 4,000 ft. Most commonly found in Yuma, La Paz and Mohave counties along floodplains and often on saline soils. | 30 = 2 – 11" 40 = 7 – 12" |
| Desert Willow | <i>Chilopsis linearis</i> | Tree | 1,500 to 5,000 ft. Washes and drainage ways. Found in all counties below the Mogollon Rim. | 30 = 2 – 11" 35 = 6 – 14" 38 = 12 - 18" 40 = 7 – 12" 41 = 8 – 20" |
| Western Soapberry | <i>Sapindus saponaria</i> | Tree | 2,400 to 6,000 ft. Cochise, Santa Cruz, Pima, Gila, Coconino, Yavapai, and Mohave counties. | 38 = 12 - 18" 41 = 8 – 20" |
| Quailbush | <i>Atriplex lentiformis</i> | Shrub | Sea level to 4,000 ft. Mohave, Yuma, La Paz, Pima, Pinal and Maricopa counties. Often on saline soils. | 30 = 2 – 11" 40 = 7 – 12" |
| Big Sacaton | <i>Sporobolus wrightii</i> | Grass (bunch) | 2,000 to 6,500 ft. Floodplains of Graham, Pinal, Navajo, Coconino, Cochise, Santa Cruz and Pima counties | 40 = 7 – 12" 41 = 8 – 20" |
| Alkali Sacaton | <i>Sporobolus airoides</i> | Grass (bunch) | 2,500 to 6,500 ft. All counties except Mohave, Greenlee, Gila, Maricopa, and Yuma | 30 = 2 – 11" 35 = 6 – 14" 40 = 7 – 12" 41 = 8 – 20" |
| Deergrass | <i>Muhlenbergia rigens</i> | Grass (bunch) | 3,000 to 7,500 ft. All counties except Yuma, Maricopa, Mohave, Navajo, and Greenlee. | 38 = 12 - 18" 39 = 14 – 25" 41 = 8 – 20" |
| Vine Mesquite | <i>Panicum obtusum</i> | Grass (sod) | 1,000 to 6,000 ft. All counties except Coconino, Graham, Pinal, and Maricopa. Occurs on swales and drainages. | 35 = 6 – 14" 38 = 12 - 18" 41 = 8 – 20" |
| Western Wheatgrass | <i>Pascopyrum smithii</i> | Grass (sod) | 3,000 to 7,000 ft. Apache, Navajo, Coconino, Yavapai, Graham, Gila and Pima counties. | 35 = 6 – 14" 38 = 12 - 18" 39 = 14 – 25" |
| Tobosa | <i>Pleuraphis mutica</i> | Grass (bunch to a sod) | 2,000 to 6,000 ft. Yavapai, Gila, Mohave, Graham, Yuma, Cochise, Santa Cruz, and Pima counties. | 35 = 6 – 14" 38 = 12 - 18" 40 = 7 – 12" 41 = 8 – 20" |

The overbank zone is located between the bankfull discharge elevation and the overbank elevation. This zone is usually formed from water transported deposits. It is generally flat and often has layered soils. It is sporadically flooded, usually about every 2-5 years. This zone is occasionally exposed to erosive water currents, ice and debris deposition, and some wind generated wave

erosion. Vegetation in the overbank zone should be flood tolerant. Normally, the vegetative composition is about 50% hydrophytic plants. Shrubby willows, seep willow, and other species with flexible stems will predominate here. Larger shrub type willows will generally occur on the higher end of the zone. Cottonwoods and tree type willows may survive well at the higher end of this zone. Species that have large inflexible stems should not be part of the planting plan in this zone. They can cause significant disruption to the stream dynamics (Hoag, et al., 2001).

Irrigation is required in the overbank/floodplain zone unless using pole planting techniques. Irrigation should be provided for up to two years to ensure plant establishment.

TRANSITION (TERRACE & UPLAND) ZONE: Trees, Shrubs, and Grasses (Drought Tolerant Plants)

| Common Name | Scientific Name | Growth Form | Elevation & Habitat | MLRA's & Precipitation Zones ¹ |
|-----------------------------|----------------------------|------------------------|--|---|
| Catclaw Acacia | <i>Acacia greggii</i> | Shrub | Sea level to 5,000 ft. All counties below and west of the Mogollon Rim. | 40 = 7 – 12” 41 = 8 – 20” |
| Whitethorn Acacia | <i>Acacia constricta</i> | Shrub | 2,500 to 5,000 ft. Greenlee, Graham, Gila, Yavapai, Cochise, Pima and Yuma counties. | 40 = 7 – 12” 41 = 8 – 20” |
| Velvet Mesquite | <i>Prosopis velutinia</i> | Tree | Sea level to 5,500 ft. Widespread in the southern, central, and northwestern Arizona and in the states major drainage systems. | 30 = 2 – 11” 38 = 12 - 18” 40 = 7 – 12” 41 = 8 – 20” |
| Western Honey Mesquite | <i>Prosopis glandulosa</i> | Tree | Western counties of Arizona. | 30 = 2 – 11” 40 = 7 – 12” 41 = 8 – 20” |
| Fourwing Saltbush (chamiza) | <i>Atriplex canescens</i> | Shrub | Up to 6,500 ft. Found in all Arizona counties. | 30 = 2 – 11” 35 = 6 – 14” 38 = 12 - 18” 40 = 7 – 12” 41 = 8 – 20” |
| Alkali Sacaton | <i>Sporobolus airoides</i> | Grass (bunch) | 2,500 to 6,500 ft. All counties except Mohave, Greenlee, Gila, Maricopa, and Yuma | 30 = 2 – 11” 35 = 6 – 14” 40 = 7 – 12” 41 = 8 – 20” |
| Tobosa | <i>Pleuraphis mutica</i> | Grass (bunch to a sod) | 2,000 to 6,000 ft. Yavapai, Gila, Mohave, Graham, Yuma, Cochise, Santa Cruz, and Pima counties. | 35 = 6 – 14” 38 = 12 - 18” 40 = 7 – 12” 41 = 8 – 20” |
| Big Galleta | <i>Pleuraphis rigida</i> | Grass (bunch) | Up to 4,000 ft. Mohave, Yavapai, La Paz, Pinal, Maricopa, and Yuma counties. | 30 = 2 – 11” 40 = 7 – 12” |
| Deergrass | <i>Muhlenbergia rigens</i> | Grass (bunch) | 3,000 to 7,500 ft. All counties except Yuma, Maricopa, Mohave, Navajo, and Greenlee. | 38 = 12 - 18” 39 = 14 – 25” 41 = 8 – 20” |

TRANSITION (TERRACE & UPLAND) ZONE: Trees, Shrubs, and Grasses (Drought Tolerant Plants – cont'd)

| Common Name | Scientific Name | Growth Form | Elevation & Habitat | MLRA's & Precipitation Zones ¹ |
|--------------------|---------------------------|-------------|---|--|
| Vine Mesquite | <i>Panicum obtusum</i> | Grass (sod) | 1,000 to 6,000 ft. All counties except Coconino, Graham, Pinal, and Maricopa. Occurs on swales and drainages. | 35 = 6 – 14” 38 = 12 - 18” 41 = 8 – 20” |
| Western Wheatgrass | <i>Pascopyrum smithii</i> | Grass (sod) | 3,000 to 7,000 ft. Apache, Navajo, Coconino, Yavapai, Graham, Gila and Pima counties. | 35 = 6 – 14” 38 = 12 - 18” 39 = 14 – 25” |

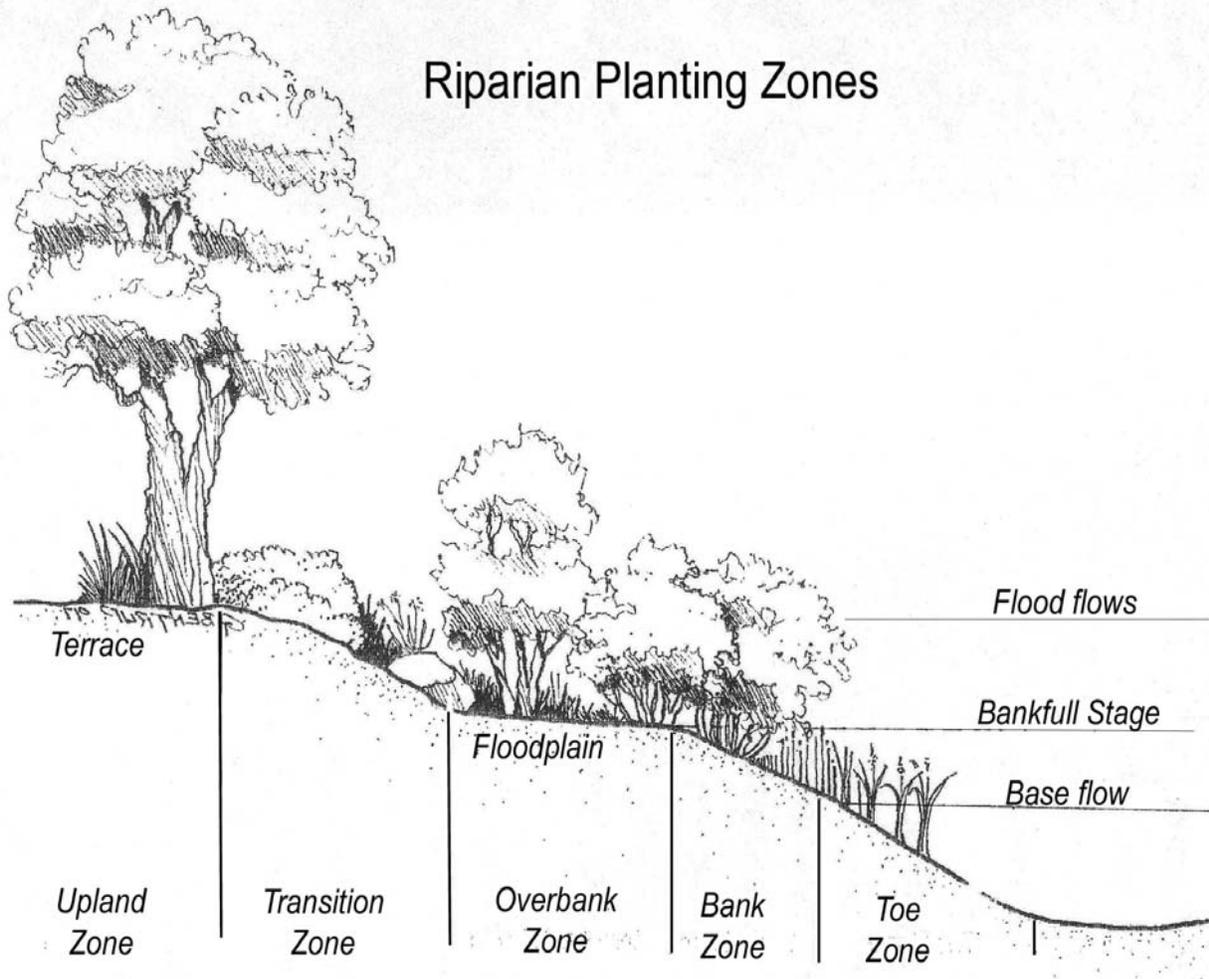
This zone is located between the overbank elevation to the upland elevation. The floodplain elevation is flooded about every 50 years. This zone is usually not subjected to erosion except during high water events in the flood prone area or overland water flow in the upland area. This zone is where hydrophytic species transition to upland species. For the most part, species in this zone are not extremely flood or inundation tolerant. This is the zone where the larger tree species are typically found (Hoag, et al., 2001). In Arizona, drought tolerance is one of the most important factors when determining what species to plant here.

Irrigation should be provided for up to two years to ensure plant establishment.

1: MLRA's and precipitation zones are provided to serve as a guide for developing an irrigation system when designing a revegetation plan for a riparian area. At a minimum, an irrigation system should be designed to ensure plant establishment and plant growth to meet the objectives of the revegetation plan. The irrigation system should have the capacity to provide frequent (2-3 week) water applications to ensure initial plant establishment and have an adequate life span to ensure long term survival of the planting. Irrigation application amounts should be based on soil texture and depth with applications adequate enough to wet the soil below the root zone based on the plants height and age.

This list is an aid in the selection and use of plant materials for riparian revegetation. Some of these species are available from commercial sources. However, availability for many species will be limited to collections from local sources. Please consult with Area Biologists and/or Plant Materials Program staff for assistance when developing a revegetation plan. More information can be obtained from Hoag, et al., 2001. Riparian Planting Zones in the Intermountain West. Information Series No. 16. NRCS-Plant Materials Center, Aberdeen, ID. (<http://plant-materials.nrcs.usda.gov/idpmc/riparian.html>)

Riparian Planting Zones



Source: Hoag, et al., 2001. *Riparian Planting Zones in the Intermountain West*.
Information Series #16. NRCS - Plant Material Center, Aberdeen, ID.

REFERENCES

1. Hoag, et al., 2001. *Riparian Planting Zones in the Intermountain West*. Information Series No. 16. NRCS-Plant Materials Center, Aberdeen, ID.
2. Little, Elbert L., Jr. 1950. *Southwestern Trees. A Guide to the Native Species of New Mexico and Arizona*. U.S. Forest Service. Agriculture Handbook No. 9, U.S. Department of Agriculture. U.S. Government Printing Office.
3. Kearny, Thomas H., Robert H. Peebles, and Collaborators. 1960. *Arizona Flora, 2nd Edition with Supplement*. University of California Press, Berkeley and Los Angeles, California.
4. U.S. Department of Agriculture. No date. *Western Wetland Flora: Field Office Guide to Plant Species*. U.S.D.A. Natural Resources Conservation Service, West Region, Sacramento, California.