

1.2 OBJECTIVES

The objectives of this multi-benefit wildlife flood escape corridors project are to:

- Create wildlife habitat on the YBWA to solve wildlife flood-safety problems and enhance year-round habitat;
- Implement restoration through regional partnerships, provide educational opportunities, and create public connections to habitat restoration in the Delta; and
- Have no significant impact on water surface elevations (WSE).

In support of the latter objective, the Central Valley Flood Protection Board (CVFPB), in cooperation with the USACE, is the responsible agency for controlling flooding within, and maintaining the integrity of, the existing flood control system and designated floodways. To assist with evaluating and demonstrating flood conveyance impacts of proposed ecosystem restoration activities within the portion of the flood control system known as the Yolo Bypass, the California Department of Water Resources (DWR) has developed a one-dimensional (1D) hydraulic model for the Sacramento River Basin system as part of the Central Valley Flood Evaluation and Delineation (CVFED) program. The model is intended to provide a flood forecasting tool and support regional planning efforts (DWR, 2014). The following flood conveyance analysis described in Sections 3 and 4 uses the CVFED hydraulic model to support both the CVFPB Encroachment Permit and Yolo County Flood Hazard Development Permit.

2 HABITAT CORRIDOR DETAILS

The following sections describe the two habitat corridors and demonstration planting areas in the YBWA to provide wildlife flood escape cover and enhance year-round habitat. For specific planting details, please refer to the 60% vegetation plans.

2.1 DEMONSTRATION PLANTING AT PARKING LOT A





The planned demonstration planting area near Parking Lot A (Figures 1 and 2) will showcase the larger restoration project and will include approximately a 0.74-acre planting of flexible native riparian species selected to be flood-tolerant, non-invasive, low maintenance and <15 ft in height and <20 ft in width. Native floodplain meadow understory planting will reduce broadleaf weeds, improve cover and escape routes for wildlife during flood events and improve forage habitat for birds, insects and wildlife. Tables 1 and 2 detail the planting species and percentages for the understory and riparian plantings, respectively. Please refer to Figure 1 and 2 for planting locations.

Table 1. Demonstration area floodplain meadow understory planting details

Plant Type	Percent	Species (Botanical)	(Common)	Ecotype
Native Grass	40%	<i>Elymus triticoides</i>	Creeping Wild Rye	Yolo County, Yolo Bypass
Native Grass	15%	<i>Elymus glaucus</i>	Blue Wild Rye	Yolo County, Yolo Bypass
Native Grass	15%	<i>Elymus trachycaulus</i> spp. <i>trachycaulus</i>	Slender Wheatgrass	Yolo County, Yolo Bypass
Native Grass	10%	<i>Hordeum brachyantherum</i>	Meadow Barley	Yolo County, Yolo Bypass
Native Forb	20%	<i>Grindelia hirsutula</i> <i>Solidago californica</i> <i>Asclepias fascicularis</i> <i>Aster chilensis</i>	CA Gumplant CA Goldenrod CA Narrowleaf Milkweed CA Aster	

Floodplain meadow understory will include a mix of 80% native grasses and 20% native forbs

Table 2. Demonstration area flexible riparian planting details

Plant Type	Layout	Mature Height	Mature Width	Percent %	Species (Botanical)	(Common)
Flexible Low Non-Shrub		3 ft.	6 ft.	30%	<i>Artemisia douglasiana</i> <i>Muhlenbergia rigens</i>	CA Mugwort
Flexible Low Shrub		6 ft.	10 ft.	15%	<i>Rosa californica</i>	CA Deergrass CA Rose
Flexible Medium Shrub		10 ft.	12 ft.	15%	<i>Cornus sericea</i>	Red osier dogwood
Flexible Large Shrub		15 ft.	15 ft.	40%	<i>Baccharis pilularis</i> <i>Atriplex lentiformis</i> <i>Baccharis salicifolia</i> <i>Cephalanthus occidentalis</i> <i>Rubus ursinus</i>	Coyote brush Quailbush Mulefat Buttonwillow CA blackberry

Total Number of flexible riparian plants: 65 (3-15ft in height)

2.2 WILDLIFE FLOOD ESCAPE CORRIDOR NORTH





The existing railroad trestle mounds located west of Lisbon Weir will be planted with flexible native riparian species selected to be flood-tolerant, non-invasive, low maintenance ranging in height from 3 to 15 ft. The mounds will be connected by corridors of native floodplain meadow that total 17.86 acres. Mounds 1 to 7 will be planted with approximately 100 plants on each trestle mound. Mound 8, the longest mound, will be subdivided into 5 pods planted with 47 plants in each pod. Tables 3 and 4 detail the planting species and percentages for the understory and riparian plantings, respectively. Please refer to Figures 1 and 2 for mound location details.

Table 3. Northern corridor area floodplain meadow understory planting details

Plant Type	Percent	Species (Botanical)	(Common)	Ecotype
Native Grass	30%	<i>Elymus triticoides</i>	Creeping Wild Rye	Yolo County, Yolo Bypass
Native Grass	15%	<i>Elymus glaucus</i>	Blue Wild Rye	Yolo County, Yolo Bypass
Native Grass	15%	<i>Elymus trachycaulus</i> spp. <i>trachycaulus</i>	Slender Wheatgrass	Yolo County, Yolo Bypass
Native Grass	20%	<i>Hordeum brachyantherum</i>	Meadow Barley	Yolo County, Yolo Bypass
Native Forb	20%	<i>Grindelia hirsutula</i> <i>Solidago californica</i> <i>Asclepias fascicularis</i> <i>Aster chilensis</i>	CA Gumplant CA Goldenrod CA Narrowleaf Milkweed CA Aster	

Floodplain meadow understory will include a mix of 80% native grasses and 20% native forbs

Table 4. Northern corridor area flexible riparian planting details

Plant Type	Layout	Mature Height	Mature Width	Percent %	Species (Botanical)	(Common)
Flexible Low Non-Shrub		3 ft.	6 ft.	30%	<i>Artemisia douglasiana</i> <i>Muhlenbergia rigens</i>	CA Mugwort CA Deergrass
Flexible Low Shrub		6 ft.	10 ft.	15%	<i>Rosa californica</i>	CA Rose
Flexible Medium Shrub		10 ft.	12 ft.	25%	<i>Baccharis pilularis</i>	Coyote brush
Flexible Large Shrub		15 ft.	15 ft.	30%	<i>Atriplex lentiformis</i> <i>Baccharis salicifolia</i> <i>Rubus ursinus</i>	Quailbush Mulefat CA Blackberry

Total Number of flexible riparian plants: 935 (3-15ft in height)

2.3 WILDLIFE FLOOD ESCAPE CORRIDOR SOUTH





The proposed southern corridor includes a single row of flexible native riparian species selected to be flood-tolerant, non-invasive, low maintenance and <15 ft in height and <20 ft in width. Native floodplain meadow understory planting will reduce broadleaf weeds, improve cover and escape routes for wildlife during flood events and improve forage habitat for birds, insects and wildlife. Tables 5 and 6 detail the planting species and percentages for the understory and riparian plantings, respectively. Please refer to Figures 1 and 2 for planting locations.

Table 5. Southern corridor area floodplain meadow understory planting details

Plant Type	Percent	Species (Botanical)	(Common)	Ecotype
Native Grass	30%	<i>Elymus triticoides</i>	Creeping Wild Rye	Yolo County, Yolo Bypass
Native Grass	15%	<i>Elymus glaucus</i>	Blue Wild Rye	Yolo County, Yolo Bypass
Native Grass	15%	<i>Elymus trachycaulus</i> spp. <i>trachycaulus</i>	Slender Wheatgrass	Yolo County, Yolo Bypass
Native Grass	20%	<i>Hordeum brachyantherum</i>	Meadow Barley	Yolo County, Yolo Bypass
Native Forb	20%	<i>Grindelia hirsutula</i> <i>Solidago californica</i> <i>Asclepias fascicularis</i> <i>Aster chilensis</i>	CA Gumplant CA Goldenrod CA Narrowleaf Milkweed CA Aster	

Floodplain meadow understory will include a mix of 80% native grasses and 20% native forbs

Table 6. Southern corridor area flexible riparian planting details

Plant Type	Layout	Mature Height	Mature Width	Percent %	Species (Botanical)	(Common)
Flexible Low Non-Shrub		3 ft.	6 ft.	30%	<i>Artemisia douglasiana</i> <i>Muhlenbergia rigens</i>	CA Mugwort CA Deergrass
Flexible Low Shrub		6 ft.	10 ft.	20%	<i>Rosa californica</i>	CA Rose
Flexible Medium Shrub		10 ft.	12 ft.	20%	<i>Cornus sericea</i> <i>Baccharis pilularis</i>	Red osier dogwood Coyote brush
Flexible Large Shrub		15 ft.	15 ft.	30%	<i>Atriplex lentiformis</i> <i>Baccharis salicifolia</i> <i>Cephalanthus occidentalis</i> <i>Rubus ursinus</i>	Quailbush Mulefat Buttonwillow CA Blackberry

Total Number of flexible riparian plants: 1,000 (3-15ft in height) @ Approximately 12 ft. spacing for the total length of the southern corridor

3 MODEL DEVELOPMENT

The following sections describe in further detail the formulation, modifications, and refinements of the 1D model for existing and Project conditions.

3.1 MODEL FORMULATION

The following analysis is based on the CVFED Sacramento River System Routing Model. The model is intended to provide a flood forecasting tool and support regional planning efforts (DWR, 2014). The CVFED model extends from Redding to the San Joaquin Delta, and incorporates all major tributaries to the