

Delta Plan Certification of Consistency

San Joaquin River West Mitigation Site (SJR West Site) Monitoring Plan

Compensation timing refers to the time between the initiation of construction at a particular site and the attainment of the habitat benefits to targeted species from designated compensation sites. For example, compensation time would be the time required for on-site plantings to provide significant amounts of shade or structural complexity from instream woody material recruitment to provide habitat for fish species. Significant long-term benefits have often been considered as appropriate to offset small short-term losses in habitat for listed species in the past, as long as the overall action contributes to recovery of the listed species. The authority to compensate prior to or concurrent with project construction is given under Water Resources Development Act (WRDA) 1986 (33 United States Code [USC] § 2283). Additionally, ER 1105- 2-100, Appendix C states that authorized ecological resource mitigation activities and features should occur before construction of the project, concurrent with the acquisition of lands, or concurrent with the physical construction of the project.

The purpose of this monitoring plan is to present conceptual mitigation proposals, establish performance standards, and outline adaptive management tasks and costs. Conceptual mitigation proposals are based on the habitat impacts described above. Performance standards are established below for each habitat type, and monitoring would be conducted with the intent of meeting those standards. Over the one-year installation and four-year plant establishment period, improvements in field and analytic techniques may lead to changes in the monitoring methodology. While this vegetation and habitat monitoring methodology protocol builds on past years' experiences, it is likely that other opportunities for improvement will be identified in the future that should be incorporated into the protocol. In the future, there may be a determination that specific performance standards have been met and that associated monitoring tasks could cease. Similarly, it could be determined that a monitoring task was not returning useful information, and therefore not worth the expense of continuation.

Monitoring must be closely integrated with adaptive management. The application of adaptive management principles to mitigation projects by modifying mitigation objectives during the monitoring period is a reasonable and foreseeable alternative. Unrealistic expectations or inaccurate assumptions can lead to the establishment of inappropriate project objectives. It is possible that a decision to modify success criteria might be reached based on results after several years of monitoring. In addition to modifying project objectives, there is a potential for changes to or adaptation of management actions based on monitoring results. The purpose of adaptive management is to enable strategic changes to improve the mitigation sites to functioning habitat.

Functions of the Impacted Water Resources

As noted previously, construction of the restoration and enhancement elements on the SJR West Site will not result in direct impacts to existing waters of the state because these features will be avoided. The intent of this Project though is to function as compensatory mitigation for implementation of the flood control elements of the Lower San Joaquin River Project, including TS_30_L as the first project being implemented under the U.S. Army Corps of Engineers' (USACE's) San Joaquin River Basin, Lower San Joaquin River, California Project.

Project Purpose and Goals

WRDA 2007 Section 2036(c) directs USACE to, where appropriate, first consider the use of an approved mitigation bank to compensate for wetland impacts. Credits for additional habitat types, including riparian zones, is also permitted, if credits are available and the use of them is deemed appropriate. Since insufficient mitigation bank credits were available, USACE proceeded with development of this SJR West Site.

Measure Performance Standards and Success Criteria

The SJR West Site will be developed and managed consistent with the Habitat Mitigation, Monitoring, and Adaptive Management Plan (see Attachment **LSJR_Feasibility Study_HMMP-AMP**) USACE's) for USACE's San Joaquin River Basin, Lower San Joaquin River, California Project. The O&M Manual developed by USACE will include long-term operational plans for the SJR West Site and identifies maintenance responsibilities. A performance period of one-year for installation and four-years for plant establishment will be required, during which USACE will be responsible for plant establishment and monitoring and reporting on success criteria outlined in the O&M Manual. In the first four seasons following plant installation, USACE will require the contractor to replace all (100 percent) dead plants. It is assumed that 10 to 15 percent of the plants would need to be replaced each year for these first four years. USACE will remove the irrigation system at the end of the five (5) years performance period. After the performance period (5-Years) concludes, San Joaquin Area Flood Control Agency (SJAFCA), or their designee, will take on maintenance responsibility in perpetuity of the established habitat in the SJR West mitigation site.

Monitoring Parameters and Protocols

Plant Surveys

Each fall (before leaf drop) for the first five (5) years following plant installation, plant surveys will be performed to assess plant survival and mortality.

Coverage: Surveys will include woody and semi-woody (sub-shrubs) plant survival and vigor assessment, native grass cover percentage (estimate), and overall grass cover percentage (estimated).

Methodology: Survey methodology will be from an actual plant count in its entirety, and not just a sampling.

Giant Garter Snake Habitat

Monitoring of giant garter snake upland habitat would focus on: (1) the percentage cover of native species, and (2) the percentage of overall vegetative cover. The restored habitat would be considered successful if 75 percent of the vegetation on site consists of native species. Additionally, the overall vegetative cover on site must be 95 percent.

Restored habitat would be monitored for one year following construction. Surveys would involve a general overview of the condition of the site, and estimate of ground cover, and a passive (observation only) giant garter snake survey to determine potential habitat use. A ground cover survey would occur to determine the ground cover percent of native and non-native species. Ground cover surveys, if determined to be needed, would involve the use of one square meter quadrats placed within the restored areas. Once placed, all herbaceous vegetation within the quadrat would be recorded to species level. The percent of cover by native and non-native species would be determined in addition to the percent of total cover.

Riparian Habitat

The following monitoring procedures will provide the information necessary to evaluate the success of riparian habitat mitigation. Vegetation sampling will occur annually for the duration of the monitoring period. Sampling will occur during spring months, at the peak of growing season, and will consist of permanent field monitoring plots along one or more transects either perpendicular to the river or parallel to the floodplain slope. Plots will be located randomly within each site, and the distance between plots and along transects will be site specific. Woody species with overhead canopy cover that falls along the vegetation monitoring transect, including those that were planted, have recruited naturally to the site, or were existing at the site prior to planting efforts would be recorded. Monitoring will measure percent cover of native and non-native plant species, structural diversity, and percent cover over water. Photograph stations are also important for documenting vegetation conditions. All plots and photograph stations will be documented via Global Positioning System (GPS) coordinates to maintain consistency throughout the monitoring period.

General observations, such as fitness and health of plantings, native plant species recruitment, and signs of drought stress would be noted during the surveys. Additionally, potential soil erosion, flood damage, vandalism and intrusion, trampling, and pest problems would be qualitatively identified. A visual check of irrigation infrastructure and fencing would also be conducted. A general inventory of all wildlife species observed and detected using the mitigation site would be documented. Nesting sites and other signs of wildlife use of the newly created habitat would be recorded.

Elderberry Shrubs

After the first year, it is anticipated that the sites would be evaluated to determine the level of project success and apply adaptive management, if necessary. If the habitat meets the below performance standards for three consecutive years, depending on physical site characteristics, conditions should be consistent enough to estimate community composition and general success of planting efforts. Three consecutive years of success should indicate that the project sites are self-sustaining and should not require supplemental irrigation or intensive weed control. Following this initial establishment period, any subsequent monitoring activities would be the responsibility of the local maintaining agency, and would

focus primarily on general and biological inspections for the purposes of fire management and habitat evaluation.

Monitoring of elderberry habitats would focus on a minimum survival rate of at least 60 percent of the elderberry shrubs. Within one year of discovery that survival has dropped below 60 percent, additional plantings would be installed to bring survival above this level. Monitoring of associated riparian habitat would focus on: (1) the percent cover of native plant species; (2) presence of at least five native species contributing to structural diversity; and (3) decrease percent cover of non-native invasive species that out-compete natives. Additionally, an inventory of wildlife species would be recorded during annual monitoring.

Monitoring would be conducted annually per the U.S Fish and Wildlife Service's (USFWS') Conservation Guidelines for the valley elderberry longhorn beetle. Two surveys would be conducted by qualified biologists between February 14 and June 30 of each year until the mitigation has met the success criteria. Surveys would include:

- An evaluation of the elderberry plants and associated native plants on the site, including the number of plants, their size and condition.
- Presence of the adult beetles, including the number of beetles observed, their condition, behavior, and their precise locations.
- Presence of beetle exit holes in elderberry stems, noting their locations and estimated ages.
- An evaluation of the adequacy of the fencing, signs, and weed control efforts in the avoidance and conservation areas.
- A general assessment of the habitat, including any real or potential threats to the beetle and its host plants, such as erosion, fire, excessive grazing, off-road vehicle use, vandalism, excessive weed growth, etc.

Long-term Management and Maintenance Practices

Weed Management

Within the first five years of planting, weeds will be removed as often as necessary so that the area within an 18-inch radius of each container plant are 90% weed-free. Additionally, grasses and weeds on the entire site would be mowed so that the site is kept in a fire-safe condition. The mowing of grasses and weeds would occur as often as needed so that 90 percent of all herbaceous growth is kept within four (4) inches of the ground at fire breaks. Selecting mowing would occur to target non-native and invasive species, but also protect the plants growing from the native grass seed mix. The mowing is to be scheduled to prevent reseeding of weeds on site.

Herbicides will also be sprayed to target non-desirable herbaceous growth. When spraying, measures will be implemented to prevent overspray and wind drift into non-target areas. These measures including not spraying during windy conditions and not spraying when warm weather could volatilize herbicides. Use of low-pressure drift resistant spray nozzles, anti-drift agents, and spray shields may also be implemented

to reduce the risk of overspray and wind drift. An appropriate herbicide will be selected that is designed to kill all non-native grasses and other undesirable herbaceous growth and prevent them from setting viable seed. No herbicides will be sprayed within the drip line of existing elderberry shrubs. All spraying will be performed by a certified applicator for the type of herbicide used.

For adaptive management strategies regarding giant garter snake habitat, riparian habitat, and elderberry shrubs, please refer to **Table 1**.

TABLE 1
ADAPTIVE MANAGEMENT SUMMARY TABLE

Monitoring Category	Metrics	Goal	Trigger level	Potential Management Response
Giant garter snake	Native vegetation	Increase percent cover of GGS upland habitat	95 percentage cover is not achieved within one year	Additional plantings and monitoring Moving and selective removal of non-native species Supplemental watering of native plants
Giant garter snake	Non-native species cover	Decrease percent of non-native invasive species that outcompete natives	Greater than 25 percent cover by non-native vegetation	Moving and selective removal of non-native species Additional revegetation of native species
Riparian	Native riparian cover	Increase percent cover of native riparian habitat.	50 percent cover of native riparian habitat within 3 years 75 percent cover of native riparian habitat within 5 years	Additional plantings and monitoring Targeted revegetation of varieties of species that are exhibiting the greatest growth and survival Replanting at elevations that are exhibiting the greatest growth and survival
Riparian	Vegetation structure	Maintain appropriate structural diversity of native riparian habitats	Suitable structural diversity is not achieved, if canopy cover and/or shrub cover does not achieve 50% within 5 years.	Additional plantings and monitoring Targeted revegetation of varieties of species that are exhibiting the greatest growth and survival at canopy, understory, and herbaceous levels.
Riparian	Vegetation cover	Increase percent vegetative cover over water per linear foot to support native fish	If percent cover over water is not 30% within 3 years, and 50% within 5 years	Additional plantings and monitoring Targeted revegetation of varieties of species that are exhibiting the greatest growth and survival
Riparian	Non-native invasive species cover	Decrease percent cover of non-native invasive species that outcompete natives	If non-native percent cover is greater than 15% during the monitoring period	Non-native plant removal through mechanical means Limited application of herbicides
Elderberry	Elderberry survival	Increase percent survivability of elderberry shrubs	If 60% survivability is not achieved during the monitoring period	Replanting at elevations that are exhibiting the greatest growth and survival
Elderberry	Riparian cover	Increase percent cover of native riparian habitat	If 50% cover of native riparian habitat is not achieved within 3 years, or 75% cover of native riparian habitat is not achieved within 5 years	Non-native plant removal Grading of site to remove non-native roots Mowing and selective removal of non-native species at optimal times for native growth

TABLE 1
ADAPTIVE MANAGEMENT SUMMARY TABLE

Monitoring Category	Metrics	Goal	Trigger level	Potential Management Response
Elderberry	Riparian structural diversity	Maintain appropriate structural diversity of native riparian habitats	Suitable structural diversity is not achieved, if canopy cover and/or shrub cover does not achieve 50% within 5 years	Adding plant cages Adding protective fencing around plantings Providing supplemental water
Elderberry	Non-native invasive species cover	Decrease percent cover of non-native invasive species that outcompete natives including elderberry shrubs	If non-native percent cover is greater than 15% during the monitoring period	Grading of site to remove non-native roots Mowing and selective removal of non-native species at optimal times for native growth

Reporting Schedule

Giant Garter Snake Habitat

Monitoring reports documenting the restoration effort would be submitted to USFWS upon completion of the restoration implementation and one year from restoration implementation. Monitoring reports would include photos, the timing of the completion of the restoration, what materials were used in the restoration, and explanations of any modification to USFWS recommended guidelines. The monitoring reports would include recommendations for additional remedial actions, if necessary.

Riparian Habitat

Monitoring reports documenting the restoration effort would be prepared following the first monitoring period and would continue annually until the site has met the success criteria. Monitoring reports would include photos, the timing of the completion of the restoration, what materials were used in the restoration, and plantings (if specified). Monitoring reports would also include recommendations for additional adaptive management measures, if necessary. Following this initial establishment period, any subsequent monitoring activities would be the responsibility of the local maintaining agency, and would focus primarily on general and biological inspections for the purposes of fire management and habitat evaluation.

Elderberry Shrubs

A written report presenting and analyzing the data from the project monitoring would be prepared following the surveys, and would be submitted by December 31 of the same year to USFWS. The report would address the status and progress of the transplanted and planted elderberry shrubs, associated native plants and trees, and any failings of the conservation plan and the steps taken to correct them. Any observations of beetles or fresh exit holes must be noted. Copies of original field notes, raw data, and photographs of the conservation area would be included with the report. A vicinity map of the site and maps showing where the individual adult beetles and exit holes were observed would also be included. The survival rate, condition, and size of the elderberry and associated native plants would be analyzed in the report. Real and likely future threats would be addressed along with suggested remedies and preventative measures (such as limiting public access, more frequent removal of invasive non-native vegetation, etc.).

Other Considerations

Buffers

The design plans for the SJR West mitigation site identify an access/maintenance route on the northeastern margin of the property (i.e., the boundary between the biological mitigation site and the rest of the Wright-Elmwood Tract property). The access/maintenance route could effectively function as a buffer between the mitigation area and the agricultural uses that are expected to continue on the rest of the tract.

Climate Change

Climate change is expected to result in increased flows through the Delta because of large precipitation events (e.g., atmospheric rivers) and as a high proportion of the precipitation will come in the form of rain (versus snow) as air temperatures rise. Sea level rise will also increase the risk of flooding events in the Delta. Many areas of the Delta are highly subsided, meaning if there were a levee breach or levee overtopping event from a flood event, the existing Delta lands behind the levees could be inundated below 10 to 15 feet in water. The SJR West mitigation site is located close to sea level in elevation, making it much more resilient to flood events than much of the Delta. The mitigation site will be predominantly restored and enhanced to wetland and riparian communities, which are expected to perform well in the event of a climate-change induced flooding event.