

**SUPPLEMENT TO  
STANDARD OPERATIONS AND MAINTENANCE MANUAL  
SACRAMENTO RIVER FLOOD CONTROL PROJECT**

**AMERICAN RIVER FLOOD CONTROL PROJECT**

**PART NO. 3 for  
VEGETATION ON MITIGATION SITES  
CARMICHAEL BLUFFS DOWNSTREAM 8.3 MILES**

Sacramento District  
Corps of Engineers  
U.S. Army  
June 2002

SUPPLEMENT TO  
STANDARD OPERATION AND MAINTENANCE MANUAL  
SACRAMENTO RIVER FLOOD CONTROL PROJECT

AMERICAN RIVER FLOOD CONTROL PROJECT  
Part No. 3 FOR  
VEGETATION ON MITIGATION SITES  
CARMICHAEL BLUFFS DOWNSTREAM 8.3 MILES

TABLE OF CONTENTS

|   |           |
|---|-----------|
| <b>SECTION I - INTRODUCTION</b>   | <b>1</b>  |
| 1-01 Authority  | 1         |
| 1-02 Purpose of the Manual  | 1         |
| 1-03 Location and Description   | 1         |
| 1-05 Construction Data and Contractor                                   | 2         |
| <b>SECTION II - LOCAL COOPERATION</b>                                   | <b>3</b>  |
| 2-01 Federal Requirements   | 3         |
| 2-02 State Legislation (Non-Federal Requirements)                       | 3         |
| <b>SECTION III - GENERAL</b>  | <b>4</b>  |
| 3-05 Semi-annual (Annual) Report  | 4         |
| 3-09 Periodic Inspection (Semi-Annual)                                  | 4         |
| 3-10 Check Lists  | 4         |
| 3-11 Drawings   | 4         |
| <b>SECTION IX - VEGETATION ON MITIGATION AREAS</b>                      | <b>5</b>  |
| 9-01 Description  | 5         |
| 9-02 Establishment of Vegetation on the Mitigation Areas                | 5         |
| 9-03 Plant Establishment Period (Short Term Operations and Maintenance) | 5         |
| 9-04 Maintenance of the Mitigation Areas                                | 8         |
| 9-05 Management and Operation of the Mitigation Areas                   | 12        |
| 9-06 Vegetation Monitoring and Reporting                                | 13        |
| <b>REFERENCES</b>   | <b>18</b> |

**SUPPLEMENT FORMAT & CONTENT**

The organization and format of this exhibit is written to be consistent with the Standard Operations & Maintenance Manual for the Sacramento River Flood Control Project (Revised May 1955), and is intended to provide supplemental information that is not presently addressed.

## TABLES

Table 1 Sac Bank - Separable Element 42, Lower American River Site 5, \_\_\_\_\_ 2  
List of Site Acreage

## EXHIBITS

| <u>Exhibit</u> | <u>Description</u>   | <u>Location</u> |
|----------------|--|-----------------|
| A              | Flood Control Regulation (contained in Standard Manual)                          | Unattached      |
| A1             | Location Map   | 1 Sheet         |
| B              | “As Constructed” Drawings  | Unattached      |
| C              | Check List - Vegetation on Mitigation Area                                       | 1 Sheet         |
| D              | Letter of Transfer to or Acceptance by the Reclamation Board                     | Unattached      |
| E              | Pest Ratings of Noxious Weed Species & Noxious Weed Seed                         | in 8 Sheets     |
| F              | “As-Built” Final Report - Mitigation Planting, LAR, Separable Element 42, Site 5 | Unattached      |
| F-1            | “As-Built” Final Report - Mitigation Planting, LAR, Site 5 Offsite Mitigation    | Unattached      |
| G              | Monthly Maintenance Log Form   | 1 Sheet         |
| H              | Example of Sampling Transect Locations   | 1 Sheet         |
| I              | Example of Rounding Out Plant Canopies for Line-Transect Measurements            | 1 Sheet         |
| J              | Performance Standards and Goals  | 1 Sheet         |
| K              | Typical Revetment Sections for Site 5 On-Site Mitigation                         | 1 Sheet         |
| L              | Original Construction Documents  | Unattached      |
| M              | Table of Environmental Commitments   | 1 Sheet         |

SUPPLEMENT TO THE  
STANDARD OPERATION AND MAINTENANCE MANUAL  
SACRAMENTO RIVER FLOOD CONTROL PROJECT

AMERICAN RIVER  
FLOOD CONTROL PROJECT

PART NO. 3 FOR  
VEGETATION ON MITIGATION SITES  
CARMICHAEL BLUFFS DOWNSTREAM 8.3 MILES

SECTION I

INTRODUCTION

**1-01 AUTHORITY**

This work was performed under the Second Phase of the Sacramento River Bank Protection Project, authorized by the Flood Control Act of 14 July 1960, Eighty Sixth Congress, Second Session, Senate Document No. 103 Project authorization was supplemented by the River Basin Monetary Authorization Act of 1974, approved by the Second Session of the 93<sup>rd</sup> Congress as Public Law 93-251. In 1982, the project authorization was further supplemented by a joint resolution of Congress as Public Law 97-377.

Additional information pertaining to authority for this project, project works, and the protection to be provided by this project are provided in the Standard Operations and Maintenance Manual and the Supplement To Standard Operation and Maintenance Manual, Sacramento River Flood Control Project, American River Flood Control Project, Carmichael Bluffs Downstream 8.3 Miles.

**1-02 PURPOSE OF THIS SUPPLEMENT:** This is a supplement, part 3, to the Sacramento River Flood Control Project Standard Operation and Maintenance Manual for the portion of the American River Flood Control Project from Carmichael Bluffs downstream 8.3 miles. This supplement is intended to provide information and guidance to maintenance personnel to the mitigation sites described herein. This supplement addresses vegetation on mitigation areas, including vegetation placed in rock revetment on berms, and does NOT address vegetation on levees. These guidelines reflect a change in the value and acceptance of certain vegetation within the flood control channel in light of changed environmental values and regulations. These guidelines shall be used in place of the Standard Operation and Maintenance Manual (1955) when managing mitigation sites. The 1955 Standard Operation and Maintenance Manual will continue to provide primary guidance for all public safety issues and decisions.

**1-03 LOCATION AND DESCRIPTION:**

a. Description of Mitigation Planting Surfaces In general, the revegetation program at each site was designed to establish a self-sustaining, mixed-canopy riparian forest and riparian scrub

habitat on waterside river bank berms. The revegetation program at each site also includes creating shaded riverine aquatic (SRA) habitat. Vegetation has been planted on a number of revetment planting surfaces and non-reveted planting surfaces. Each site and project may vary due to unique conditions and goals for each project or site.

(1) Site 5 On-site Mitigation (river mile 8.7 RT) is located on the north bank between Howe Avenue and Watt Avenue. It is about 1500 lineal feet in length. Bank protection and mitigation features at Site 5 were constructed in 1998 and 1999. Mitigation features include an irregular shore line, submerged low bench with fine textured instream woody material; an undulating, cobble lined, low berm surface; planting on the low berm surface and slope above; biotechnical plantings on rock tie backs in the low berm surface; and biotechnical plantings at the toe of the slope above the low berm surface.

(a) Low Berm. The low berm will provide a mixed-canopy riparian forest and provide SRA habitat, riparian mitigation, and erosion control. Woody riparian and herbaceous vegetation at site 5 was directly planted on a cobble-lined, low berm surface. The surface of the low berm undulates longitudinally in elevation providing a varied-depth surface, which will promote the establishment of a mixed riparian habitat. At Site 5 a soil trench extends beneath the berm and provides capillary water to plants during low flow periods.

(b) Bank Slope. The bank slope creates a mixed-canopy riparian habitat. The revetment surface of the bank slope consists of soil embankment and a 12inch thick layer of cobble. The bank slope varies and ranges in elevation. Trees and shrubs were planted in the soil embankment through the cobble layer. Lower slope elevations were planted with trees and shrubs that tolerate inundation and deposition and require more water.

(2) Site 5 Offsite Mitigation (river mile 11.6 RT) is located just downstream from the Harrington Way river access. This site is about 1700 LF in length. Mitigation features at this site were constructed in winter of 2000/2001. Mitigation features include plantings in a linear strip, 10 ft or so above existing band of vegetation at summer low water surface elevation as well as plantings in more level areas from summer low water level to band of existing Elderberry shrubs. This site also features a 30' wide buffer area above the bank slope consisting of native grasses and Oak trees.

The following table constitutes project sites, their location and the reclamation district or maintenance area within which they are located.

| Table 1<br>Sac Bank - Site 5 Mitigation<br>List of Site Acreage |  |                      |                      |             |
|---|--|----------------------|----------------------|-------------|
| Unit No.  | Site                                       | Reclamation District | Existing vs New Berm | Acreage     |
| NA  | Site 5, onsite Mitigation                  | ARFCD                | new                  | 0.7         |
|   | Site 5 offsite mitigation at Rm 11.6 Right | ARFCD                | No berm              | 1.62        |
| <b>TOTAL FOR ALL SITES</b>                                      |  |                      |                      | <b>2.32</b> |

**1-05 CONSTRUCTION DATA AND CONTRACTOR:** The contractor and construction data for the project sites are listed in the following paragraphs.

a. Site 5, Onsite Mitigation

(1) Rockwork: Construction of Sacramento River Bank Protection Contract LAR 2, Site 5, Phase 1, onsite at the location as shown on Exhibit A-1, was accomplished under contract No. DACW05-99- C-0016 by AFA Construction, Inc., during the period from January 1999 to April 1999. File No. 50-04-6066 and Specifications No. 1040.

(2) Mitigation Planting: Construction of Sacramento River Bank Protection Contract, Lower American River Site 5, Phase 2, onsite mitigation at the location as shown on Exhibit A-1, was accomplished under contract No. DACW05-99- C-0016 by AFA Construction, Inc., during the period from September 1999 to November 1999. File No. 50-04-6066 and Specifications No. 1040.

b. Site 5 Offsite Mitigation at RM 11.6R

(1). Mitigation Planting: Construction of Sacramento River Bank Protection Contract, Lower American River Site 5 Offsite Mitigation Revegetation at the location as shown on Exhibit A-1, was accomplished under contract No. DACW05-01-C-0002 by Sierra View Landscape during the period from December 2000 to March 2001. File No. 1-25-475 and Specifications No. 1105.

## SECTION II

### LOCAL COOPERATION

**2-01 FEDERAL REQUIREMENTS:** Federal responsibility shall include the following:

a. Prepare the appropriate environmental documentation (EA or EIS), when requested by, and in cooperation with, the Non-Federal Sponsor. Coordinate with U.S. Fish & Wildlife Service and National Marine Fisheries Service and determine mitigation requirements in consultation with these agencies using the Habitat Evaluation Procedure or other methodology.

b. Prepare wildlife habitat mitigation design, oversee implementation, and ensure maintenance of plants has achieved root establishment and obtained other success criteria prior to turnover to Non-Federal Sponsor. Refer to Section 9-02 for exceptions.

c. Prepare a wildlife habitat mitigation report. This report shall document, with text, photographs and when appropriate, as built plans, existing conditions of site and plants at time of turnover to Non-Federal Sponsor. The report may be part of post construction reports required at the time of turnover to the Non-Federal Sponsor. The report shall be distributed to the Non-Federal Sponsor, the Corps' Environmental Resources Branch (CESPK-PD-R) and the Corps' Project Manager (CESPK-PM).

d. In joint responsibility with Non-Federal Sponsor, ensure that environmental commitments such as riparian mitigation measures and monitoring requirements are successfully implemented in accordance with National Environmental Policy Act (NEPA) and the Federal Endangered Species Act (ESA) and the California Environmental Quality Act (CEQA). (Refer to exhibit M for environmental commitments.)

e. Provide As-Constructed drawings.

f. Prepare project Operations & Maintenance Manual revisions as they apply to each mitigation project.

g. Coordinate appointment of a Mitigation Evaluation Team by the Army Corps of Engineers. The MET shall consist of representatives of the Army Corps of Engineers, the State of California Reclamation Board and the Sacramento Flood Control Agency in coordination with the U.S. Fish and Wildlife Service and the State Department of Fish and Game.

**2-02 STATE LEGISLATION (NON-FEDERAL REQUIREMENTS):** Non-Federal responsibility shall include the following:

a. Protect and preserve all mitigation vegetation on site that has been turned over to the Non-Federal Sponsor, including desirable vegetative growth as it "volunteers" throughout the life of the project. Allow vegetation to grow to maturity within mitigation areas.

b. Make semi-annual inspections and submit annual reports (which shall include text and a

photographic documentation of plant progress). Refer to section 3-09.

c. Perform all operations, maintenance, monitoring and remedial requirements as stated herein.

d. Over the life of the project (as defined in the EA), replant and replace all vegetation that has died as a direct result of vandalism, public use (accidental damage) and negligent maintenance practices, for example, herbicide overspray, lack of beaver cage maintenance, and fire damage, other than 'Acts of God' to plants. All 'Acts of God' damage shall be revisited by all concerned agencies and decisions, relative to replanting, made on a case by case basis.

e. Refer to section 9-02 for a list of projects/sites that the Non-Federal Sponsor has agreed to take responsibility for the plant establishment period.

f. The local sponsor for each site listed in table 1, pg 2 are as follows:

(1) Site 5 On-site and Offsite Mitigation: Reclamation Board. Contact the General Manager of the Reclamation Board through the California State Department of Water Resources.

### **SECTION III**

#### **GENERAL**

**3-05 ANNUAL REPORT:** The Non-Federal Sponsor shall prepare an annual report for the mitigation areas for submittal to the District Engineer. The Non-Federal Sponsor shall provide a copy of the report submitted to the District Engineer to the Corps' Environmental Resources Branch (CESPK-PD-R), and the Corps' Project Manager (CESPK-PM). The annual report shall compile information from the checklists that are prepared for the semi-annual inspections (refer to section 3-09). The annual report shall address all significant events that took place during the previous 12 months and shall include: the checklists for the semi annual inspections, a photographic record of overall conditions, a photographic record of specific significant damage and a summary statement of general vegetation conditions for the period of time from the preceding report. During monitoring years, the annual monitoring report may serve as the annual report.

**3-09 PERIODIC SEMI-ANNUAL INSPECTIONS:** Inspections of mitigation areas shall be initiated by the Non-Federal Sponsor and made with interested agencies at the times specified below to compare progress with the goals of the mitigation plans as stated in the environmental documentation and other project documents. Provide the Corps written notice 30 days prior to all inspections and invite the Corps to participate in the inspection.

a. Spring Inspection: At a minimum, inspection shall occur during April through June. Leaves emerge from buds at this time making it a good time for visual plant identification, and a good time for evaluating general plant health and mortality.

b. Fall Inspection: At a minimum inspection shall occur during September through October, just prior to the rainy season, typically when plant stress is most prevalent. Some plants may appear dead during this time of the year, but are actually alive. These plants may be exhibiting a physiological response to stress, such as early leaf fall, during prolonged drought conditions. Therefore, survival counts taken during the spring inspection are generally more accurate.

**3-10 CHECK LISTS:** A specific check list form for reporting results of inspections of these mitigation areas is contained in this supplement as Exhibit C. These checklists shall be completed during each semi-annual inspection.

**3-11 DRAWINGS:** Exhibit B, As-built drawings (unattached).

**3-12 FINAL REPORTS:** Final Reports/Revegetation Project Summaries are provided as Exhibit F.

## SECTION IX

### VEGETATION ON MITIGATION AREAS

**9-01 DESCRIPTION:** This section addresses maintenance requirements for vegetation and associated items on the above mentioned mitigation areas. The contents in this exhibit are general in nature and apply to all mitigation project sites. Site-specific revisions to this exhibit addressing requirements unique to each site will be provided as new sites are completed. The format of revisions shall conform to, and be consistent with, this exhibit.

**9-02 ESTABLISHMENT OF VEGETATION ON THE MITIGATION AREAS:** For some projects the Non-Federal Sponsor has agreed to take on the “Establishment” responsibility of the vegetation. These projects shall include all effort, in addition to section 9-03 Plant Establishment Period (Short Term Operations and Maintenance), necessary to establish the vegetation. When required, the establishment of vegetation on the mitigation areas shall be specified in each revision to the exhibit. Refer to the following list for projects for which the Non Federal Sponsor has agreed to be responsible for the Plant Establishment Period:

- a. Site 5 onsite mitigation
- b. Site 5 offsite mitigation at RM 11.6 Right

**9-03 PLANT ESTABLISHMENT PERIOD (PEP), OR SHORT-TERM OPERATIONS AND MAINTENANCE** General. The PEP will start at the turnover of the project to the Non-Federal Sponsor and be a minimum of 36 months in duration if no significant replanting is required. Throughout this period, operations and maintenance requirements are expected to be relatively intense compared to the requirements of the following post-PEP. During the PEP, the Non-Federal Sponsor will be responsible for performing the operations and maintenance requirements listed below. At the end of the PEP, the mitigation sites will be considered successful if they are self-sustaining (refer to section 9-04) and provide adequate compensation as outlined in the performance standards (Exhibit J) to offset habitat losses associated with the project. If the performance standards are not met the Non-Federal Sponsor will consult with the mitigation evaluation team on possible remedial measures [refer to paragraph 2-06, e]. The Non-Federal Sponsor will be responsible for determining maintenance methods and schedules needed to perform these maintenance requirements. Operations and maintenance requirements of revegetation features during the PEP will include but are not limited to the following:

- a. Site assessments of overall planting areas to determine plant condition, weed growth, and other revegetation-related site conditions.

- (1) Regular Inspections. The Non-Federal Sponsor will inspect mitigation areas. The inspections will be concurrent with maintenance activities during the PEP to ensure that plant materials are in a healthy and vigorous condition.

- (2) Clean up. The Non-Federal Sponsor will maintain the site in a natural-appearing condition throughout the PEP. Site cleanup will occur at a minimum, at all scheduled irrigation

events. All garbage, construction debris, excess plants, and dirt left over from replanting or site repair operations, other discarded materials, and extraneous equipment will be removed from the site in accordance with state and local regulations.

(3) Woody Debris and Felled Trees. Natural woody debris (i.e., logs, branches, or uprooted trees), whether from mitigation plantings or other sources, shall not be removed, unless it poses a threat to public safety, including river users, or if it promotes local scour (i.e., movement or loss of stone or mats along bank protection features, including the upper slope, the low berm and low berm face).

(4) Damage and Repair. Maintenance, repair, or replacement of all revegetation features will be the responsibility of the Non-Federal Sponsor through the duration of the PEP. This includes maintenance, repair, or replacement of rock structures and erosion control measures required for mitigation habitat creation. Repair of rock structures and erosion control measures required for flood protection and public safety shall be governed by the standard operations and maintenance manual and subsequent supplements. Refer to section 1-01 and 1-02.

b. Installation, maintenance, operation, and removal of the irrigation system at each site.

(1) Irrigation System. The Non-Federal Sponsor will be responsible for the installation, operation, maintenance, and removal of the irrigation system and application of irrigation as described in the following paragraphs. The system must be capable of providing an adequate and equivalent quantity of irrigation to each planting site.

(a) First Year irrigation schedule and Rate: Each plant shall receive a minimum of one (1) application every seven (7) days during the months of April through October. Each application shall include a minimum of five (5) gallons per plant, or a sufficient quantity of water applied by overhead spray to uniformly wet the soil in the entire planting area to a minimum depth of 18 inches. Additional applications shall be required during November through March, if a minimum of 1/2 inch of precipitation does not fall on the plants during any six week period.

(b) Second Year irrigation schedule and Rate: Each plant shall receive a minimum of one (1) application every seven (7) days during the months of April through October. Each application shall include a minimum of fifteen (15) gallons per plant, or a sufficient quantity of water applied by overhead spray to uniformly wet the soil in the entire planting area to a minimum depth of 24 inches. Additional applications shall be required during November through March, if a minimum of 1/2 inch of precipitation does not fall on the plants during any six week period.

(c) Third Year irrigation schedule and Rate: Each plant shall receive a minimum of one (1) application every fourteen (14) days during the months of April through October. Each application shall include a minimum of thirty (30) gallons per plant, or a sufficient quantity of water applied by overhead spray to uniformly wet the soil in the entire planting area to a minimum depth of 36 inches. Additional applications shall be required during November through March, if a minimum of 1/2 inch of precipitation does not fall on the plants during any

six week period.

If a new system is used, the Non-Federal Sponsor will install the entire system on the project site at the beginning of each irrigation season. At the end of each irrigation season, the Non-Federal Sponsor will remove the entire system from the project site. The Non-Federal Sponsor will be responsible for maintaining the irrigation system in a fully operational condition throughout the irrigation season defined herein. The Non-Federal Sponsor will hand water the plant materials when the irrigation system is not in place, if necessary, as determined by the Non-Federal Sponsor.

(2) Irrigation Season. The irrigation season will be April 1 through October 31 of each year of the PEP. The irrigation season may be adjusted at the Non-Federal Sponsor's discretion based on site-specific conditions (e.g., high or low water surface elevations, prolonged or delayed rainy seasons).

(3) Irrigation Applications. The beginning and shutdown dates for the irrigation schedule are dependent on weather conditions. If most of the plant material appears to be stressed (e.g., water stress [over-watering], stunted growth, wilting, premature leaf loss, and yellowing of leaves [deciduous spp.]) and in danger of perishing or becoming severely damaged, the Non-Federal Sponsor will adjust the frequency and duration of watering. The Non-Federal Sponsor will be responsible for applying irrigation at the rates specified in the original construction documents, or at a similar rate if a different irrigation system design is used.

#### c. Weed Control

(1) Requirements. Weed control will consist of hand-pulling, mechanical removal, or spot applications of herbicide to maintain a minimum 2-foot diameter weed-free zone around each individual planting location. Weeds will include all woody and herbaceous plants occurring within a 1-foot radius around each plant. Weed control may also involve the removal or control of particularly invasive non-native species outside of the 2-foot diameter around each plant. Refer to exhibit E for guidance and a list of weeds to be controlled. Weeds will also be controlled on all access roads and ramps.

(2) Herbicides. If herbicides are used, they will be non-selective, broad-spectrum, post-emergent, translocating herbicides approved for use in and around aquatic habitats by the U.S. Environmental Protection Agency. Herbicides, fertilizer, or other chemical-based materials will not be stored on the project site. Herbicides will be applied to avoid drift outside the designated revegetation planting areas and will protect existing plants to remain or to be transplanted from herbicide drift. Herbicides shall be applied in accordance with all State and local regulations.

(3) Elderberry (*Sambucus* sp.) plantings or naturally occurring elderberries. At no time will herbicides be sprayed onto undesired vegetation within 100 feet of any elderberry plantings or naturally occurring Elderberry plants at onsite or offsite mitigation planting areas. Although these plantings are not considered to be in a designated elderberry shrub mitigation site they will provide valley elderberry longhorn beetle (VELB) habitat. Weeds must be mechanically or manually within 100 feet of elderberry plants. However, in order to control particularly invasive

non-native weed species (e.g., *Arundo donax*), where herbicide application is the only viable means of weed eradication, herbicides may be applied by “painting” the cut stem or portions of the foliage. Minimal painting will occur to limit the quantity of applied herbicides. This method will be used as a means of preventing elderberry shrubs from competition from weed species.

(a) Elderberry plantings at Site 5 onsite mitigation: At the time of project construction, Site 5 was not considered to be an elderberry replacement area. Elderberry seedlings planted at Sites 5 were intended to enhance the riparian planting areas and not function as elderberry mitigation. Elderberry shrubs that have no stems greater than 1" in diameter and no exit holes are not subject to minimization measures under the USFWS conservation guidelines and may be removed by the Non Federal Local Sponsor. Elderberry shrubs planted as part of the mitigation plantings at site 5 onsite and removed by the Non Federal Local Sponsor shall be replaced by suitable species selected from the original plant list.

d Replacement Planting. Replacement of plant material, and/or implementation of other remedial measures, to meet performance standards in years 3 and 8. Replacement planting of woody or herbaceous plant material is required if there is high plant mortality and the site is not achieving, or is not trending toward achieving, the performance standards outlined in Section 9-05. Plant mortality may be the result of numerous factors, including but not limited to, acts of nature, site suitability for the species planted, or insufficient maintenance activities. The quantity of replacement plants during a given maintenance year, if necessary, will be determined based on the monitoring results and an estimation by the Non-Federal Sponsor of the quantity of plants required to meet the performance standards.

(1) Woody Plant Species. During the PEP, individual plant counts (summarized as percent survival values) will be performed for all woody plant material, with the exception of biotechnical installations of live cuttings for erosion control, such as brush layers and wattles. If individual plant counts are infeasible based on site conditions (e.g., dense vegetative growth) a cover based monitoring method will be used. The target performance goals for survival of woody plant material during years 1, 2, and 3 of the PEP are 70 percent, 60 percent and 50 percent survival, respectively, based on original population at time of turnover to the Non-Federal Sponsor. If the recommended performance goal for plant survival is not met, the Non-Federal Sponsor may elect to replant all or a portion of the planting sites needed to increase the percent survival to the required level.

Replacement planting will be performed in the fall or winter of each maintenance year. Plants of the same species and planting size as were originally installed will be installed unless it is determined that another species is better suited to a particular site condition. Replacement plants will be installed according to the original construction documents unless another viable alternative should be considered based on the cause of mortality or future site conditions. Dead plants will be completely removed before installation of replacement plants and will be removed from the site.

If replacement plants are required, all replacement plant propagation materials will be collected from local genetic stock from within the project site region as outlined in the original

construction documents. Refer to Section 1-05 Construction Data and Contractor. Adjustments to the original planting design will be recorded on the as-maintained drawing and in the annual reports.

(2) Herbaceous Species on the Low Berm. Herbaceous species on the low berm surface with sparse cover or bare areas greater than 25 square feet in area will be re-seeded with the original seed mix and application rates as specified in the original construction documents, refer to section 1-05 Construction Data and Contractor, modified as necessary, or re-plugged with container stock of the herbaceous plants originally installed. If an area has sparse or bare areas, but has an overstory of woody plant growth (e.g., willows, blackberries, native roses) reseeded/replanting will occur at the discretion of Non-Federal Sponsor. If significant loss of vegetation or damage to the site occurs, the Non-Federal Sponsor will discuss potential remedial measures with the mitigation evaluation team.

e. Biotechnical plantings. The integrity of the biotechnical plantings, which are a feature of some of the mitigation planting surfaces, shall be maintained during the PEP. This will include regularly checking the integrity of the wooden stakes and ensuring that the edges of erosion control blankets and mats are secure. The Non-Federal Sponsor will be responsible for repairing damage to the mat system caused by vandalism, fire, debris, or other causes during the PEP.

f. Maintenance of signs. The Non-Federal Sponsor will maintain the revegetation and VELB signs throughout the PEP. Maintenance will include replacing lost, stolen, or damaged signs; and performing any corrective actions required to maintain desired sign conditions.

g. Preparation of project documentation, including submittals. The Non-Federal Sponsor will be responsible for documenting project conditions and progress throughout the Plant Establishment Period (PEP). Documentation will include monthly maintenance logs, and annual monitoring reports, which are described in the following section.

(1) Plant Establishment Form (Monthly Maintenance Log). Throughout the PEP, the Non-Federal Sponsor will be responsible for daily (monthly logs) record keeping of the maintenance activities, including but not limited to irrigation, weed control (i.e., types of herbicides used, application rates, personnel performing work), and replacement planting. The Non-Federal Sponsor will compile all data recorded during the plant establishment activities on a form similar to the example in Exhibit G. The Non-Federal Sponsor will compile and present the forms for that year (one form for each month) in the annual reports. Refer to page 4 paragraph 3-05 for requirements of the Annual Report.

h. Providing site surveillance and other measures to protect vegetation from vandalism following installation and during the establishment period.

i. Some sites have been provided with temporary seasonal beaver barrier fencing. This fencing is intended to reduce but not completely eliminate beaver damage. For the duration of the PEP the fencing may be removed at the discretion of the local sponsor at the threat of inundation by high river flows in winter and spring and shall be reinstalled in late spring after the threat of high river flows are over. The posts on which the fences are installed are intended to

remain in place until the fencing is permanently removed. The following sites have been provided with temporary beaver fencing.

- (1). Site 5 offsite mitigation at RM 11.6 Right
- (2). Site 5 onsite mitigation

**9- 04 MAINTENANCE OF THE MITIGATION AREAS (LONG TERM OPERATION AND MAINTENANCE):** Plants that have established themselves will continue to live without any artificial support by maintenance personnel. "Establishment" is defined herein as *"sustained self-sufficiency where the plant is able to sustain growth without additional artificial watering, fertilizing, herbicide spraying, weeding, pruning, cultivation, or other general maintenance practices normally associated with sustaining ornamental vegetation"*. The following items address impacts that shall be addressed by, and are the responsibility of, the Non-Federal Sponsor in maintaining acceptable site and plant conditions so that vegetative growth will not be impeded. All maintenance activities, such as spraying and debris removal, shall be carried out in a manner which avoids impact to threatened and endangered species.

a. General Plant Care: "Park-like" conditions shall be avoided in the mitigation areas. Greater habitat value is afforded by those conditions that might be unsightly in a park situation, for example, downed trees, broken branches, unmowed grass, etc. No removal of vegetation shall occur without prior written approval from the Federal Sponsor except as defined below in paragraph d. Weed Control.

b. Tree Preservation: Preserve ALL existing trees on mitigation areas except as defined below in paragraph d. Weed Control. Only those trees that directly interfere with levee or revetment maintenance shall be removed.

c. Volunteer Growth: Preserve all native volunteer growth that is consistent with requirements and objectives of mitigation site plans and environmental documentation. The design concept on most sites includes developing the upperstory, which provides a seed source for most "successional growth" understory vegetation. The upperstory reduces the air and soil temperature, which creates a microenvironment at the understory level that is more conducive to volunteer growth. This design concept encourages, and is dependent upon, volunteer growth to achieve the objectives of the environmental documentation. Volunteer growth will achieve the regeneration of "successional growth" desired in mitigation plans required of most projects. Mowing these areas will suppress this growth and is not recommended. Ensure that all maintenance practices of adjoining lands do not negatively affect the mitigation site.

d. Weed Control: General weed control on the mitigation sites is not desirable and could cause more destruction to the desirable vegetation than the benefits received by its eradication. Whenever weed control is permitted, care shall be taken to isolate the spray (or other method if used) so that only the targeted plant is affected. Ensure weed growth is controlled on the firebreaks at each site. The maintenance districts will be allowed to control noxious weeds within the guidelines of the State of California, Department of Food and Agriculture, Division of Plant Industry. The maintenance district shall notify the Department of Water Resources, Flood Control Project Branch before taking any action. For guidance refer to, Pest Ratings of Noxious

Weed Species and Noxious Weed Seed, Exhibit E. Herbicides shall be applied in accordance with all State and local regulations.

e. **Selective Clearing/Pruning:** Downed trees and branches, dead limbs, and dead trees provide habitat for numerous wildlife species. Therefore, clearing and pruning shall not occur unless such materials restrict site access from the ramps, prove to be detrimental to the integrity of the bank protection structure, present a risk to public safety, or overhang firebreaks. Pruning is permitted to maintain design hydraulic flows. Due to the different physical characteristics of mitigation sites, visual access of the levees shall be maintained. Levee slopes shall be visible from the levee tops.

f. **Human Impacts:** Some sites are located near population centers and are impacted by both legitimate and non-legitimate uses. All damage as a result of these activities is the responsibility of the Non-Federal Sponsor and shall be repaired and replanted the by the Non-Federal Sponsor as required to meet environmental commitments. The following categorizes the greatest potential for damage from human impacts and shall be policed by the Non-Federal Sponsor:

**(1) Public Use:** The public's impact on a site will continue to be potentially disruptive to the vegetation. Ensure recreational activities do not impact the plants. If public use becomes destructive, the Non-Federal Sponsor shall take corrective measures to replace plants and to ensure their survival.

**(2) Local Maintenance District Damage:** Standard maintenance practices may pose a threat to the mitigation vegetation. Each district shall assess its present maintenance practices and determine if it can continue these practices or if it needs to adjust these methods to be less detrimental to the vegetation. Some traditional practices are not be appropriate for some sites and different methods shall be implemented. Local maintenance personnel are the people most involved with the sites on a day to day basis and therefore stand the greatest risk of inadvertently damaging them. Current levee maintenance practices, such as burning, can quickly destroy years of mitigation work, if maintenance procedures get out of control. The most common methods used to control vegetative growth on the levee structure (not the berm) are evaluated as follows:

- \* **Mowing:** Mowing is by far the safest method used to control vegetative growth and limit potential damage, and should be encouraged, where feasible.
- \* **Discing:** Discing is another preferred method, but is not as widely used due to its limited application to levee maintenance. Discing is most effective in maintaining a firebreak along the toe of the levee structure.
- \* **Spraying:** Chemical spraying is commonly used. Care shall be taken to prevent spray drift onto adjoining areas in accord with all applicable local, State and Federal laws.
- \* **Burning:** Burning is the least preferred. The potential for damage is great.

(3) Vandalism: Vandalism is always a potential threat but generally decreases over time. Most vandalism involves the theft of planting stock while young (usually the first year after planting). As the plant root systems develop, the plants become hard to remove, and are no longer a desirable target. Cutting of trees for firewood is another long-term threat. Vandalism damage to signs, fences, gates, and beaver barrier cages are long term problems and shall be repaired or replaced by the Non-Federal Sponsor in a timely fashion.

(4) Trash: Trash is disruptive to plant growth and wildlife. Trash shall be promptly removed from the site and discarded properly.

g. **Wildlife and Domestic Animal Caused Damage:** Beaver, deer, rabbit, and gopher damage is an ongoing threat to the vegetation. Beaver damage is the most common of these. On some sites, beaver barrier cages and/or fences have been installed to protect a percentage of the highly susceptible species and shall be checked at each inspection. Repair of these items shall be made on a timely basis to ensure further damage does not continue. These cages provide additional protection from deer browse. Even though small trees are the beavers' preferred food, they will damage the larger trees as well. Cottonwood and willows are the beavers' preferred species, however beavers are also known to fell other species of trees. The beaver barrier cages shall not be removed at any time, except when it would girdle the plant. Deer, rabbit, and gopher damage are prevalent while the vegetation is young but will have less of an impact over time. Wildlife damage is considered as an 'Act of God' and shall be revisited by all concerned agencies and decisions, relative to replanting, made on a case by case basis. Cattle, horses, sheep and goats shall be kept off the site and damage caused by domestic animals shall be the responsibility of the Non-Federal Sponsor.

h. **Natural Environmental Damage:** Natural processes are inevitable and could occur at any time during the course of re-establishing the vegetation. However, over time the damage will likely be less, due to the maturity of the vegetation. Windthrow of trees may increase over time as trees mature. All 'Acts of God' damage shall be revisited by all concerned agencies and decisions, relative to replanting, made on a case by case basis. Environmental damage caused by human impacts are events other than 'Acts of God' even though the results could be the same, i.e., a lightning fire versus a cigarette caused fire.

(1) Flood & Erosion: Flood and erosion damage could be an annual occurrence, such occurrences shall be documented in each annual report. Damage due to flooding will impact both vegetation and soil erosion.

(2) Fire & Wind: Fire and wind damage shall be documented in each annual report. Fire is a potential threat from both maintenance practices and public carelessness. Wind damage occasionally occurs but generally does not result in large-scale damage.

i. **Vegetation Free Zone:** Where applicable, the vegetation free zone is an area adjacent to the landside and/or waterside toe of the levee where no type of woody vegetation is permitted. This zone is required for maintenance and floodfighting activities and must be accessible at all times. Maintain a 15-foot-wide firebreak at the toe of the levee on all berm sites with average widths of 30 feet or greater and around perimeter of site where possible and so designated. Occasionally

firebreaks have been provided on berms of less width and will be designated as such in the mitigation as-built drawings. Most berm sites less than 30 feet in width generally do not have a firebreak, due to lack of space. These firebreaks shall be kept clear of vegetative growth at all times. Tree limbs shall be pruned so that the air space above firebreak is also kept clear. Coordinate with and follow fire districts' recommendation for road maintenance and fire prevention.

j. Woody Debris and Felled Trees: Woody debris washing down the river during high flows tends to settle out as water levels recede. As a result, it is possible for debris or snags to accumulate in or around the bank protection features at the project sites. While there are certain advantages provided by such materials (e.g., wildlife habitat and shelter), the presence of woody debris can pose a threat to public safety. The issue of public safety will be the overriding consideration for deciding when to remove debris and woody debris or felled trees will be removed at Non-Federal Sponsor's discretion.

k. Beaver Barrier Cage, Signage, Fencing, and Access Gate Maintenance: Beaver barrier cages and/or fencing have been provided on some of the mitigation areas. All cages and fences shall be maintained in an effective condition, which will deter beavers from damaging the vegetation. Signs and access gates shall be maintained in a readable and operable condition, respectively. Signs shall be checked annually. Any sign found to be damaged or unreadable shall be replaced or repaired to its original condition.

l. Public Health and Safety: Vegetation will be managed to meet operation, maintenance, repair, replacement and rehabilitation (OMRRR) requirements of authorized flood control and other authorized project features. Vegetative management may include partial or complete removal of vegetation for OMRRR purposes. Local maintenance entities shall coordinate with the Non-Federal Sponsor and receive the Non-Federal Sponsor's approval prior to undertaking any action.

m. Other Miscellaneous Items: Ensure access roads are kept in good passable order. Ensure that all other items associated with individual projects are maintained as per mitigation plans. Maintenance records of these items shall be presented as applicable in each annual report.

## **9-05 MANAGEMENT AND OPERATION OF THE MITIGATION SITES (Adaptive Management)**

a. General. The operations and maintenance manual assumes the mitigation features will function as a self-sustaining established site, capable of natural regeneration and not requiring additional irrigation after the PEP. However, in the event of a structural failure, or if the vegetation fails to meet long-term performance standards or is otherwise in noncompliance with project requirements the procedures and standards required by this operations and maintenance manual may be insufficient or ineffective. In such cases, the mitigation evaluation team will be responsible for reviewing monitoring reports, evaluating results, and recommending remedial measures to be implemented by the Non-Federal Sponsor. This process is known as "Adaptive Management". The remedial measures would provide information for the repair, replacement, or rehabilitation of vegetation and structural features required for creation of mitigation habitat. Structural features required for flood control and public safety are governed by the standard operation and maintenance manual, refer to section 1-01 and 1-02..

Because the factors that might require remediation can not be identified specifically, some potential factors will be briefly summarized herein. If it should become necessary, more specific information pertaining to the cause of the problem and the proposed adaptive management technique will be prepared by the mitigation evaluation team.

b. Determination of the Need for Adaptive Management. The monitoring results and visual observations that are made during the annual and semi-annual inspections will determine noncompliance with long-term performance standards for all revegetation or problems regarding bank or other site features. The Non-Federal Sponsor will report this information to the mitigation evaluation team. Based upon review of the report, the current understanding about system dynamics, current site conditions, and the project's performance standards, the mitigation evaluation team will recommend what actions, if any, may be required.

c. Selection of Critical Areas. The project site may be affected by a number of natural events or human impacts. Remedial action may be necessary throughout the revegetation areas or in specific areas. The selection of specific or critical areas will be based on the following considerations, or other factors not listed below that may effect project performance:

(1) After remediation, is the area capable of achieving self-sufficiency in a reasonable period of time?

(2) If original mortality was a result of inappropriate species composition within a microhabitat condition, would modifying the plant palette result in greater plant survival rates?

(3) If original mortality was a result of berm or bank failure, would modifying the structures result in greater survival rates?

d. Potential Reasons for Implementing Adaptive Management Actions. There are a number of possible circumstances that may require adaptive management actions. Such circumstances may include the following:

- (1) Berm or bank failure resulting from high flow events or other causes.
- (2) Excessive wildlife damage.
- (3) Competition with invasive, non-native weed species.
- (4) Human impacts, including vandalism, arson or inadvertent impacts.
- (5) Natural events, such as floods or wildfire.
- (6) Unforeseen hazardous condition arising in association with mitigation features, practices or development.

#### **9-06. VEGETATION MONITORING AND REPORTING**

The goal of wildlife habitat mitigation projects is to create self-sustaining habitats per the specific requirements of the environmental documentation done in accordance with the National Environmental Policy Act (NEPA) and the U.S. Fish and Wildlife Service's biological opinion (if any) issued pursuant to the Federal Endangered Species Act (ESA) for that project. The mitigation will be considered self-sustaining if the site achieves, or is trending toward achieving, the performance standards at the end of the monitoring program and is determined successful in providing adequate compensation to offset losses from project construction. Vegetation monitoring will occur in June of each of the designated monitoring years.

Following mitigation project construction, the Corps will transfer the responsibilities for monitoring and reporting for the biological resources monitoring programs to the Non-Federal Sponsor. Monitoring shall be supervised or conducted by a qualified biologist, botanist or habitat restoration specialist. The Non-Federal Sponsor shall be responsible for attaining the performance standards for the monitoring program.

a. **Performance Standards and Goals.** Performance standards are minimum vegetation reestablishment objectives that must be achieved in monitoring years designated in the monitoring schedule to meet project objectives. Failure to achieve performance standards may necessitate implementation of remedial measures to mitigate project impacts. In addition to performance standards for the completion of the PEP and at the end of the designated monitoring period, interim performance goals have been established for post PEP monitoring years as designated in the monitoring schedule to identify the need for management changes to improve the success of re-establishment of riparian vegetation and ensure compliance with performance standards at the end of the designated monitoring period. If implementation of remedial measures is required at, or towards the end of the monitoring period, monitoring would be performed for a least 5 years after measures are implemented. Refer to Exhibit J for performance standards.

b. Monitoring Schedule.

(1) Site 5 onsite and offsite mitigation: The site will be monitored in June in year 1, 2, 3, 5, and 8, which will begin the year following installation of the mitigation features

(a) For onsite mitigation, the monitoring period is expected to begin in June 2000 and end in year 2007

(b) For offsite mitigation at RM 11.6 Right , the monitoring period is expected to begin in June 2001 and end in year 2008.

(2) Future Sites

c. Monitoring Methods.

(1) Site 5 onsite mitigation and offsite mitigation: Individual plant counts will be used in monitoring years 1-3. In subsequent monitoring years tree canopy cover will be measured by aerial photography or, alternately by data collected along permanent transects to be established perpendicular to the riverbank. The transects will be sequentially numbered and established at 150-foot intervals starting from the upstream end of the project site and will extend the width of the project site (Exhibit H). The beginning and end of each transect will be permanently marked to allow replication of surveys in subsequent monitoring years. The monitors will measure the canopy width of trees and shrubs with foliage that intersects the transect line (Exhibit I). Percent tree canopy cover will be determined by measurement of the length of the transect intersected by overhanging tree cover.

(2) Future Sites

d. Photographic Documentation. A sufficient number of permanent photographic sampling points will be established by the Non-Federal Sponsor at each of the project sites so that a visual record of habitat development can be provided. The sampling points will be established during the first year monitoring surveys and the locations will be identified in the first year monitoring report. Photographs taken from each of these locations will be included in subsequent monitoring reports.

e. Monitoring Reports.

(1) Site 5 onsite mitigation and offsite mitigation: Annual monitoring reports for Site 5 onsite Mitigation and offsite mitigation shall be submitted to the Non-Federal Sponsor, the Corps' Environmental Resources Branch (CESPK-PD-R), and the Corps' Project Manager (CESPK-PM) by December 31 of each monitoring year. Monitoring reports will include the following:

(a) Aerial photographs taken for the survey (if used).

- (b) Percent tree canopy cover over each site.
- (c) Maps showing the survey transect locations (if used).
- (d) A summary of monitoring data for the project site by transects (if used).
- (e) Photographic documentation of site from permanent sampling points.
- (f) Qualitative description of the growth and vigor of vegetation.
- (g) A qualitative description of the low berm substrate and depositional features, if applicable.
- (h) A qualitative description of the establishment of volunteer vegetation.
- (i) A description of how plantings are performing relative to performance standards and goals.
- (j) A description of how each species planted is performing.
- (k) A description of environmental factors that may be adversely affecting planting success.
- (l) A description of proposed and implemented remedial measures.

## (2) Future Sites

f. Remedial Measures. If riparian vegetation reestablished on the project site fails to meet performance standards, mitigation may be required. The Mitigation Evaluation team will advise the Non federal sponsor as to specific remedial measures. The level of effort required will be determined based on the magnitude and causes of failure. Potential remedial measures that may be implemented to achieve performance standards include the following:

- (1) Planting additional plants at the project site.
- (2) Extending the irrigation period.
- (3) Planting additional riparian plants at off-site locations.

If implementation of remedial measures is required, monitoring would be performed in the areas of the mitigation site affected by remedial measures for a 5-year period after measures are implemented.

## REFERENCES

- Jones & Stokes Associates, Inc, 1996. Adopted final environmental assessment and initial study of streambank protection at River Park - lower American River. June. (JSA 96-099.) Sacramento, CA. Prepared for U.S. Army Corps of Engineers, Sacramento District, Sacramento, CA, and State of California, The Reclamation Board, Sacramento, CA. With technical assistance from Ayres Associates, Fort Collins, CO.
- U.S. Army Corps of Engineers, 1955. Standard operation and maintenance manual for the Sacramento River flood protection project. Revised version. May. Prepared by the U.S. Army Corps of Engineers, Sacramento District, Sacramento, CA.
- U.S. Army Corps of Engineers, 1996. Addendum to the Standard Operation and Maintenance Manual for the Sacramento River Flood Protection Project. Revised version. October. Prepared by the U.S. Army Corps of Engineers, Sacramento District, Sacramento, CA.
- U.S. Army Corps of Engineers and State of California Reclamation Board 1998. Final. Environmental Impact Report and Supplemental Environmental Impact Statement V for the Sacramento River Bank Protection Project. March. Prepared by the U.S. Army Corps of Engineers, Sacramento District, Sacramento, CA; and State of California, The Reclamation Board, Sacramento, CA.

**EXHIBIT A**

**FLOOD CONTROL REGULATIONS**  
**(See Standard Manual)**

**EXHIBIT A1**  
**LOCATION MAP**

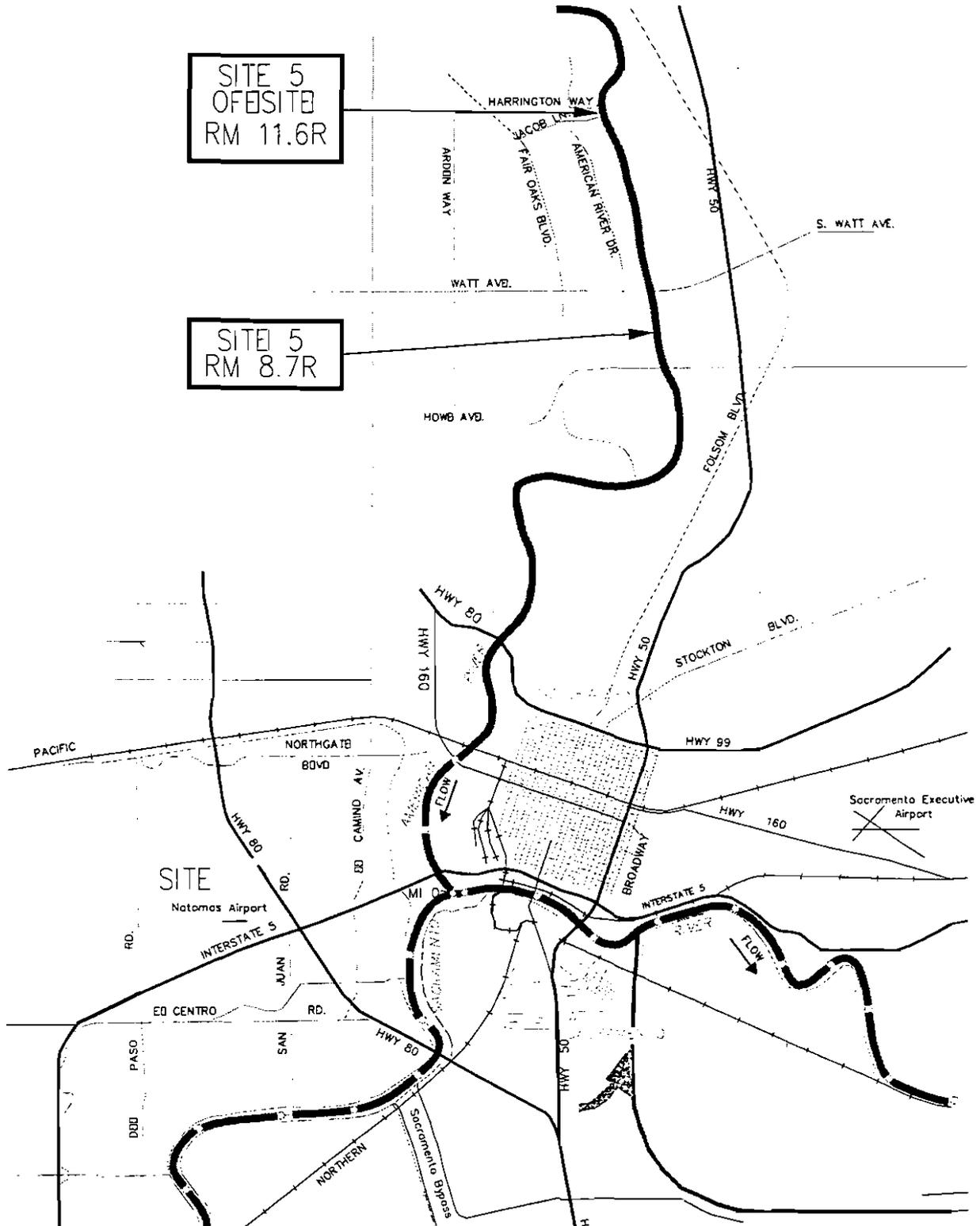


EXHIBIT B

**EXHIBIT B**

**“AS CONSTRUCTED” DRAWINGS**

SEE SEPARATE FOLDER FOR THE FOLLOWING DRAWINGS:

Title: Sacramento River Bank Protection Contract LAR 2, Site 5, Phase 1  
File No. 50-04-6066

Title: Sacramento River Bank Protection Project, Lower American River Site 5 Phase 2  
File No. 50-04-6066

Title: Sacramento River Bank Protection Project, Lower American River Site 5 Offsite  
Mitigation  
File No. 1-25-475

ADDITIONAL DRAWINGS OF CROSS-SECTIONS, STRUCTURES, AND  
MISCELLANEOUS FACILITIES ARE AVAILABLE IN THE OFFICE OF THE DISTRICT  
ENGINEER.

EXHIBIT C

CHECK LIST NO. 1

VEGETATION ON MITIGATION AREA  
SEMI ANNUAL INSPECTION FORM

Location of Area Inspected: Part No. \_\_, Unit No.'s: \_\_\_\_\_ Date: \_\_\_\_\_  
(including river mile(s)) \_\_\_\_\_  
Inspected by: \_\_\_\_\_

Report below the condition of the site and those items requiring maintenance work. Opposite each item listed, indicate the appropriate response, yes or no, in the area provided. Provide an attachment, if necessary, describing the negative significant conditions and any proposed/implemented maintenance work for each item. Note any changes, positive or negative, from the previous inspections.

Reference O&M Unit No.

| Item No. | Description   | Response | Yes   | No*   |
|----------|---|----------|-------|-------|
| 1:       | Mitigation area erosion free.....                       | :        | _____ | _____ |
| 2:       | Vegetation is free of fire damage.....                  | :        | _____ | _____ |
| 3:       | Vegetation is free of flood damage.....                 | :        | _____ | _____ |
| 4:       | Vegetation is free of wind damage .....                 | :        | _____ | _____ |
| 5:       | Vegetation is free of herbicide damage .....            | :        | _____ | _____ |
| 6:       | Vegetation is free of wildlife damage.....              | :        | _____ | _____ |
| 7:       | Vegetation & equipment is free of vandalism .....       | :        | _____ | _____ |
| 8:       | Site is free of trash .....                             | :        | _____ | _____ |
| 9:       | Fire-break plowed and clear of growth.....              | :        | _____ | _____ |
| 10:      | Access roads clear.....                                 | :        | _____ | _____ |
| 11:      | Access gate barriers & locks in good working order..... | :        | _____ | _____ |
| 12:      | Beaver barrier cages or fencing in good condition ..... | :        | _____ | _____ |
| 13:      | New volunteer growth (trees, shrubs) observed .....     | :        | _____ | _____ |
| 14:      | Perimeter fencing in good working condition .....       | :        | _____ | _____ |
| 15:      | Other items: _____                                      | :        | _____ | _____ |

COMMENTS \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

\*Requires explanation

EXHIBIT D  
Unattached

**EXHIBIT D**

LETTER(S) OF TRANSFER TO AND/OR ACCEPTANCE  
BY THE RECLAMATION BOARD

EXHIBIT E

STATE OF CALIFORNIA  
DEPARTMENT OF FOOD AND AGRICULTURE  
DIVISION OF PLANT INDUSTRY

PEST RATINGS OF NOXIOUS WEED SPECIES  
AND NOXIOUS WEED SEED

PURPOSE

To advise commissioners as to the Department's policy regarding any pest action.

DEFINITIONS

"A" An organism of known economic importance subject to state (or commissioner when acting as a state agent) enforced action involving: eradication, quarantine regulation, containment, rejection, or other holding action.

"B" An organism of known economic importance subject to: eradication, containment, control or other holding action at the discretion of the individual county agricultural commissioner.

or

An organism of known economic importance subject to state endorsed holding action and eradication only when found in a nursery.

"C" An organism subject to no state enforced action outside of nurseries except to retard spread. At the discretion of the commissioner.

GUIDANCE

The district will be allowed to control noxious weeds classified as "A" and identified by the Department of Food and Agriculture as "(an) organism of known economic importance to state (or commissioner when acting as a state agent) enforced action involving: eradication, quarantine regulation, containment, rejection, or other holding action."

The district will be allowed to control noxious weeds classified as "B" and identified by the Department of Food and Agriculture as (an) organism of known economic importance subject to: eradication, containment, control or other holding action at the discretion to the individual county agricultural commissioner.

Before the district eradicates any plant belonging to either class "A" or "B", the plant to be eradicated must be identified as a noxious weed in either class "A" or class "B" by a qualified biologist or a representative of the county agricultural commissioner's office. The district shall notify the Department of Water Resources, Flood Control Project Branch before taking action.

**"A" SPECIES**

***Eradication, containment, rejection or other holding action at the state-county level.  
Quarantine interceptions to be rejected or treated at any point in the state.***

|   |                                     |
|---|-------------------------------------|
| <u>Acaena anserinifolia</u>   | bidly bidly                         |
| <u>Acaena novae-zelandiae</u><br>(- <u>A anserinifolia</u> in part as<br>used previously and of British<br>and Australian authors.) | bidly bidly                         |
| <u>Acaena pallida</u><br>(- <u>A anserinifolia</u> in part<br>as used previously.)  | bidly bidly                         |
| <u>Achnatherum brachychaetum</u><br>(- <u>Stipa brachychaeta</u> )  | punagrass                           |
| <u>Albagi maurorum</u><br>(- <u>A pseudalhagi</u> )   | camelthorn                          |
| <u>Alternanthera philoxeroides</u>  | alligatorwood                       |
| <u>Arctotheca calendula</u>   | capeweed, as seed or fertile plants |

***"A" - Pests Continued***

|                              |                           |
|------------------------------|---------------------------|
| <u>Carduus acanthoides</u>   | plumeless thistle         |
| <u>Carduus nutans</u>        | musk thistle              |
| <u>Carthamus leucocaulos</u> | whitstem, distaff thistle |
| <u>Centaurea diffusa</u>     | diffuse knapweed          |
| <u>Centaurea iberica</u>     | Iberian starthistle       |
| <u>Centaurea maculosa</u>    | spotted knapweed          |
| <u>Centaurea squarrosa</u>   | squarrosa knapweed        |

|   |                        |
|---|------------------------|
| <u>Chondrilla juncea</u>  | skeletonweed           |
| <u>Cirsium ochrocentrum</u>   | yellowspine thistle    |
| <u>Cirsium undulatum</u>  | wavyleaf thistle       |
| <u>Crupina vulgaris</u>   | bearded creeper        |
| <u>Cucumia melo</u> var. <u>dudain</u>  | dudain melon           |
| <u>Cuscuta reflexa</u>  | giant dodder           |
| <u>Euphorbia esula</u>  | leafy spurge           |
| <u>Euphorbia serrata</u>  | serrate spurge         |
| <u>Halimodendron halodendron</u>  | Russian salttree       |
| <u>Halogeton glomeratus</u>   | halogeton              |
| <u>Helianthus ciliaris</u>  | blueweed               |
| <u>Heteropogon contortus</u>  | tanglehead             |
| <u>Hydrilla verticillata</u>  | hydrilla               |
| <u>Linaria gonistifolia</u> spp. <u>dalmatica</u><br>(- <u>L. dalmatica</u> )   | Dalmatian, toadflax    |
| <b>"A" - Pests Continued</b>  |                        |
| <u>Onopordum</u> spp.   | onopordum thistles     |
| <u>Orobanche ludoviciana</u> var. <u>cooperi</u><br>(- <u>O cooperi</u> (Gray) Heller, as<br>used in Munz', A Flora of Southern<br>California.) | Cooper's<br>broomrape  |
| (- <u>O multiflora</u> Nutt., as used<br>in Correll and Johnston's Manual<br>of the Vascular Plants of Texas.)                                  | desert broomrape       |
| <u>Orobanche ramosa</u>   | branched, broomrape    |
| <u>Peganum harmala</u>  | harmel                 |
| <u>Physalis virginians</u> var. <u>sonorae</u><br>(- <u>p subglabrata</u> as used previously.)  | smooth<br>groundcherry |

EXHIBIT E

|   |                      |
|---|----------------------|
| <u>Prosopis strombulifera</u>                                       | creeping mesquite    |
| <u>Salsola vermiculata</u>  | wormleaf salsola     |
| <u>Salvia virgata</u><br>(- <u>S pratensis</u> as used previously.) | meadow sage          |
| <u>Scolymus hispanicus</u>  | golden thistle       |
| <u>Solanum cardiophyllum</u><br>nightshade                          | heartleaf            |
| <u>Solanum dimidiatum</u>   | Torrey's nightshade  |
| <u>Sonchus arvensis</u>   | perennial sowthistle |
| <u>Sphaerophysa salsula</u>   | Austrian peaweed     |
| <u>Striga lutea</u><br>(- <u>S asiatica</u> )                       | witchweed            |
| <u>Tagetes minuta</u>   | wild marigold        |
| <u>Zygophyllum fabago</u>   | Syrian beancaper     |

**"B" SPECIES**

***Eradication, containment, control or other holding action at the discretion of the commissioner.***

|   |                                |
|---|--------------------------------|
| <u>Acacia paradoxa</u><br>(- <u>A armata</u> )                                    | kangaroothorn                  |
| <u>Acrontilon repens</u><br>(- <u>Centaurea repens</u> )                          | Russian knapweed               |
| <u>Aegilops cylindrica</u>  | jointed goatgrass              |
| <u>Aegilops ovata</u><br>(- <u>A geniculata</u> and<br><u>A neglecta</u> in part) | ovate goatgrass                |
| <u>Aegilops triuncialis</u>   | barb goatgrass                 |
| <u>Aeschynomene rudis</u>   | rough jointvetch               |
| <u>Agropyron repens</u>   | (see <u>Elytrigia repens</u> ) |

|   |                                 |
|---|---------------------------------|
| <u>Allium paniculatum</u>                               | panicled onion                  |
| <u>Allium vineals</u>                                   | wild garlic                     |
| <u>Ambrosia trifida</u>                                 | giant ragweed                   |
| <u>Araujia sericofera</u>                               | bladderflower                   |
| <u>Cardaria chalepensis</u>                             | lens-podded hoarycress          |
| <u>Cardaria drabs</u>                                   | heart-poddedhoarycress          |
| <u>Cardaria pubescens</u>                               | globe-podded hoarycress         |
| <u>Carthamus baeticus</u>                               | smooth distaff thistle          |
| <u>Carthamus lanatus</u>                                | woolly distaff thistle          |
| <u>Centaurea calcitrapa</u>                             | Purple starthistle              |
| <u>Centaurea repens</u><br><b>"B" - Pests continued</b> | (See <u>Acroptilon repens</u> ) |
| <u>Centaurea sulphurea</u>                              | Sicilian thistle                |
| <u>Chorispora tenella</u>                               | purple mustard                  |
| <u>Cirsium arvense</u>                                  | Canada thistle                  |
| <u>Coronopus squamatus</u>                              | swinecress                      |
| <u>Cucumis myriocarpus</u>                              | paddy melon                     |
| <u>Cynara cardunculus</u>                               | artichoke thistle               |
| <u>Cyperus esculentus</u>                               | yellow nutsedge                 |
| <u>Cyperus rotundus</u>                                 | purple nutsedge                 |
| <u>Elytrigia repens</u><br>(- <u>Agropyron repens</u> ) | quackgrass                      |
| <u>Euphorbia oblongata</u>                              | oblong spurge                   |
| <u>Gaura coccinea</u>                                   | scarlet gaura                   |
| <u>Gaura drummondii</u>                                 | scented gaura                   |

(- G odorata)Gaura sinuata

wavyleaf gaura

Gypsophila paniculata

baby's breath

Imperata brevifolia

satintail

Isatis tinctoria

dyer's woad

Lepidium latifolium

perennial peppercress

Lythrum salicaria

purple looserife

Muhlenbergia schreberi

nimblewill

Nothoscordum inodorum

false garlic

**"B" - Pests continued**Nymphaea mexicana

banana waterlily

Oryza rufipogon

red rice

Panicum antidotale

blue panicgrass

Physalis viscosa

grape groundcherry

Polygonum cuspidatum

Japanese

Polygonum polystachyum

Himalayan knotweed

Polygonum sachalinonae

giant knotweed

Rorippa austriaca

Austrian fieldcress

Salvia aethiopsis

Mediterranean sage

Senecio Jacobaea

tansy ragwort

Senecio squalidus

Oxford ragwort

Sesbania punicea

Scarlet Wisteria, Rattlebox

Setaria faberi

giant foxtail

Solanum carolinense

Carolina horsenettle, knotweed

Solanum elaeagnifolium

white horsenettle

|                            |                           |
|----------------------------|---------------------------|
| <u>Solanum lanceolatum</u> | lanceleaf nightshade      |
| <u>Solanum marginatum</u>  | white-margined nightshade |
| <u>Symphytum asperum</u>   | rough comfrey             |
| <u>Ulex europaeus</u>      | gorse                     |
| <u>Viscum album</u>        | European mistletoe        |

**"C" SPECIES**

*State endorsed holding action and eradication only when found in a nursery: action to retard spread outside of nurseries at the discretion of the commissioner: reject only when found in a cropseed for planting or at the discretion of the commissioner.*

|   |                    |
|---|--------------------|
| <u>Carduus pycnocephalus</u>  | Italian thistle    |
| <u>Carduus tenuiflorus</u>  | Italian thistle    |
| <u>Cenchrus echinatus</u>   | Southern sandbur   |
| <u>Cenchrus incertus</u>  | coast sandbur      |
| <u>Cenchrus longispinus</u><br>(- <u>C pauciflorus</u> as<br>used previously) | mat sandbur        |
| <u>Centaurea solstitialis</u>   | yellow starthistle |

\*\*\*\*\*

**“As-Built”**

**Final Report**

Sacramento River Bank Protection Contract, Lower American River Site 5 Phase 2  
Onsite Mitigation Planting

Prepared for

U.S. Army corps of Engineers  
Sacramento District  
1325 J Street  
Sacramento, CA 95814

Contract No. DACW05-99- C-0016

Prepared by

(\_\_\_\_\_), Principal

(Contractor's Company Name  
Address &  
Phone No.)

(\_\_Date\_\_)

**“As-Built”**

**Final Report**

Sacramento River Bank Protection Contract, Lower American River  
Site 5 Offsite Mitigation

Prepared for

U.S. Army corps of Engineers  
Sacramento District  
1325 J Street  
Sacramento, CA 95814

Contract No. DACW05-01- C-0002

Prepared by

(\_\_\_\_\_), Principal

(Contractor's Company Name  
Address &  
Phone No.)

(\_\_ Date \_\_)

Exhibit G. Sample Format for Daily Log Form  
 Plant Establishment Form to Record Irrigation, Weed Control, and Plant Mortality

Project: \_\_\_\_\_ Sheet no. \_\_\_\_\_ of \_\_\_\_\_

Note: Designate river and river mile for site location. Check or indicate the appropriate responses.

|   |                     |                     |                   |                 |                |                |  |
|---|---------------------|---------------------|-------------------|-----------------|----------------|----------------|--|
| Date _____                              |                     | Site Location _____ |                   |                 |                |                |  |
| Purpose of Visit                        | inspection          | irrigation          | weeding           | mowing          | repair         | census         |  |
| weather conditions                      | cloudy              | rainy               | clear             | hot             | warm/mild      | cool           |  |
| irrigation info                         | flushed system      | repairs             | duration/amount   | personnel _____ |                |                |  |
| Weed Control                            | chemical type _____ |                     | manual            | personnel _____ |                |                |  |
| Damage to                               | fences/gates        | beaver cages        | irrigation equip. | signs           | plants         | other          |  |
| Damage from                             | vandalism           | flood               | fire              | herbicide       | wildlife _____ |                |  |
|   | livestock           | RD work _____       |                   | other _____     |                |                |  |
| Plant Mortality                         | species _____       | quantity _____      | species _____     | quantity _____  | species _____  | Quantity _____ |  |
|   | species _____       | quantity _____      | species _____     | quantity _____  | species _____  | Quantity _____ |  |
| Items to be addressed next visit _____  |                     |                     |                   |                 |                |                |  |
| Problems, Observations, Comments: _____ |                     |                     |                   |                 |                |                |  |

|   |                     |                     |                   |                 |                |                |  |
|---|---------------------|---------------------|-------------------|-----------------|----------------|----------------|--|
| Date _____                              |                     | Site Location _____ |                   |                 |                |                |  |
| Purpose of Visit                        | inspection          | irrigation          | weeding           | mowing          | repair         | census         |  |
| weather conditions                      | cloudy              | rainy               | clear             | hot             | warm/mild      | cool           |  |
| irrigation info                         | flushed system      | repairs             | duration/amount   | personnel _____ |                |                |  |
| Weed Control                            | chemical type _____ |                     | manual            | personnel _____ |                |                |  |
| Damage to                               | fences/gates        | beaver cages        | irrigation equip. | signs           | plants         | other          |  |
| Damage from                             | vandalism           | flood               | fire              | herbicide       | wildlife _____ |                |  |
|   | livestock           | RD work _____       |                   | other _____     |                |                |  |
| Plant Mortality                         | species _____       | quantity _____      | species _____     | quantity _____  | species _____  | Quantity _____ |  |
|   | species _____       | quantity _____      | species _____     | quantity _____  | species _____  | Quantity _____ |  |
| Items to be addressed next visit _____  |                     |                     |                   |                 |                |                |  |
| Problems, Observations, Comments: _____ |                     |                     |                   |                 |                |                |  |

**EXHIBIT H**

**EXAMPLE OF SAMPLING  
TRANSECT LOCATIONS**

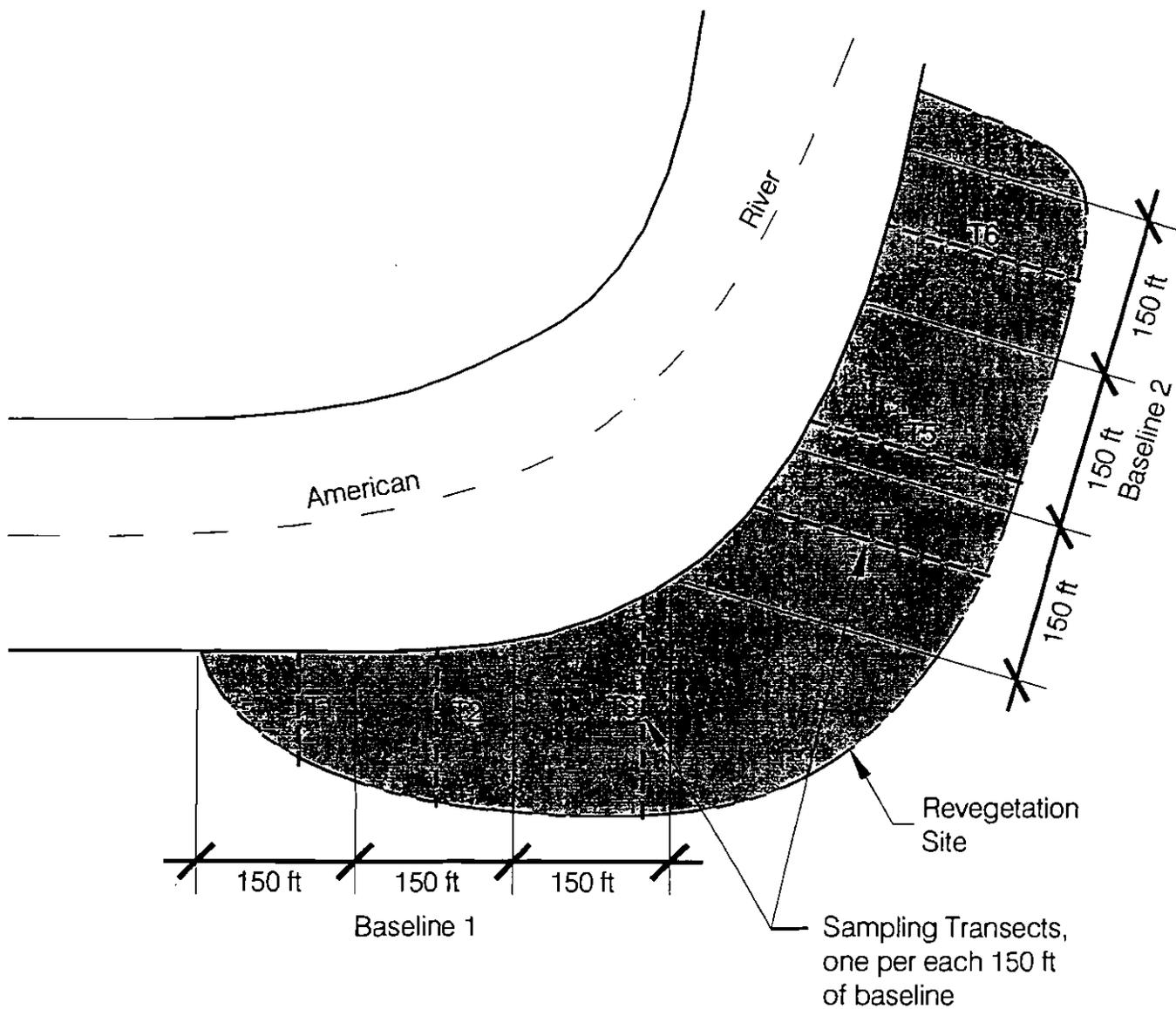
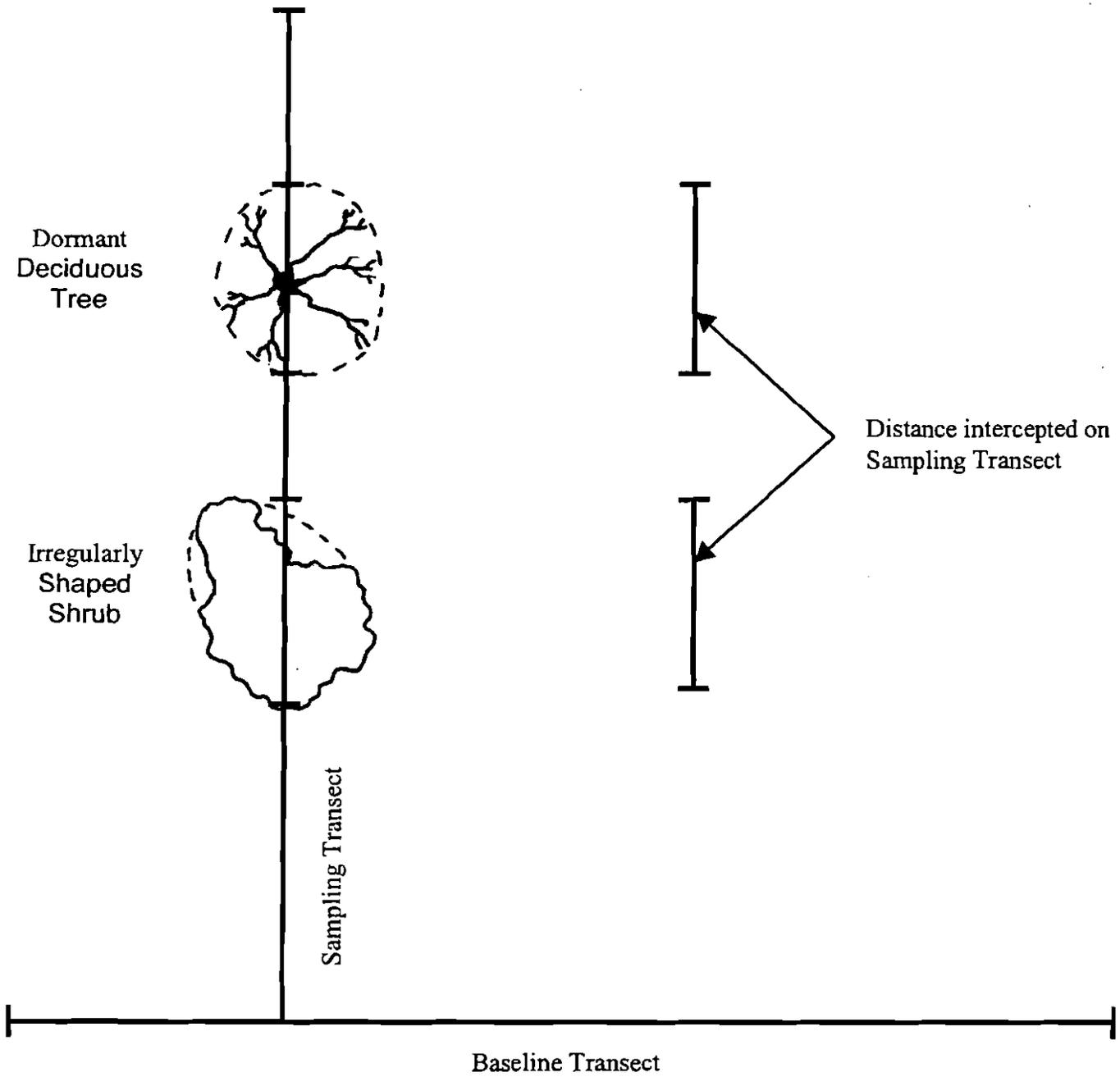


EXHIBIT I

EXAMPLE OF ROUNDING OUT PLANT CANOPIES FOR  
LINE-TRANSECT MEASUREMENTS



## EXHIBIT J

**Performance Standards and Recommended Performance Goals for Site 5 Onsite Mitigation and  
Offsite Mitigation**

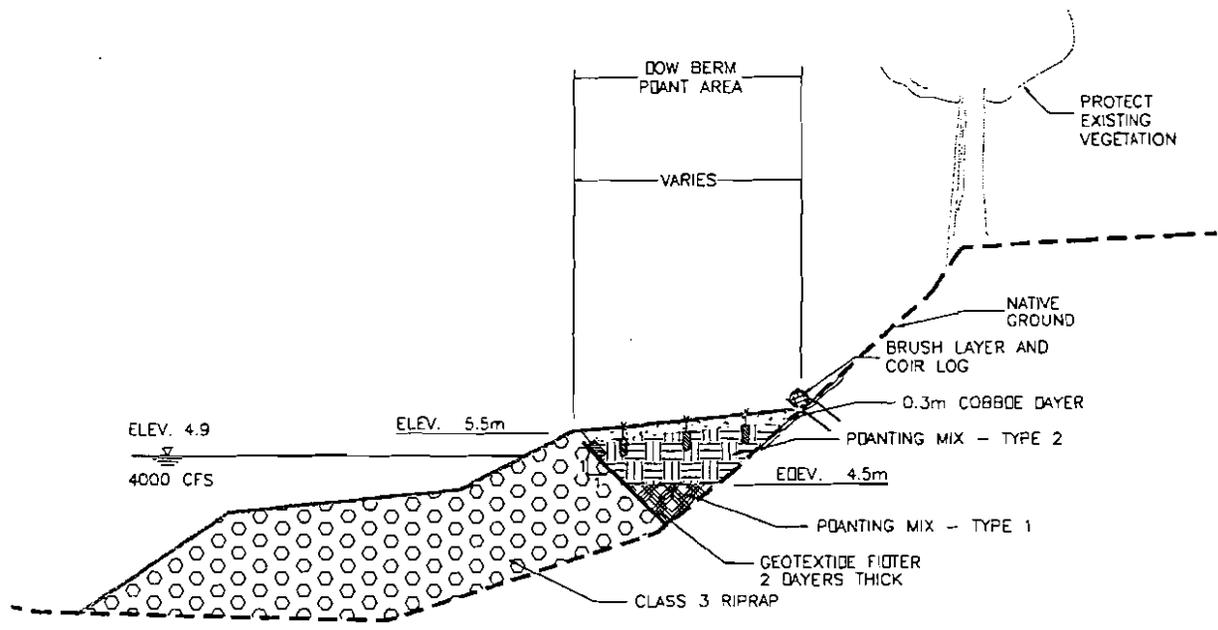
**Site 5 Mitigation Performance Standards**

| <b>monitoring regime</b>    | <b>plant establishment period</b> |               |               | <b>post establishment period</b> |               |
|-----------------------------|-----------------------------------|---------------|---------------|----------------------------------|---------------|
| <b>performance criteria</b> | <b>survival rate</b>              |               |               | <b>canopy cover</b>              |               |
| <b>monitoring year</b>      | <b>year 1</b>                     | <b>year 2</b> | <b>year 3</b> | <b>year 5</b>                    | <b>year 8</b> |
| <b>percentage required</b>  | 70%                               | 60%           | 50%           | 30%                              | 60%           |

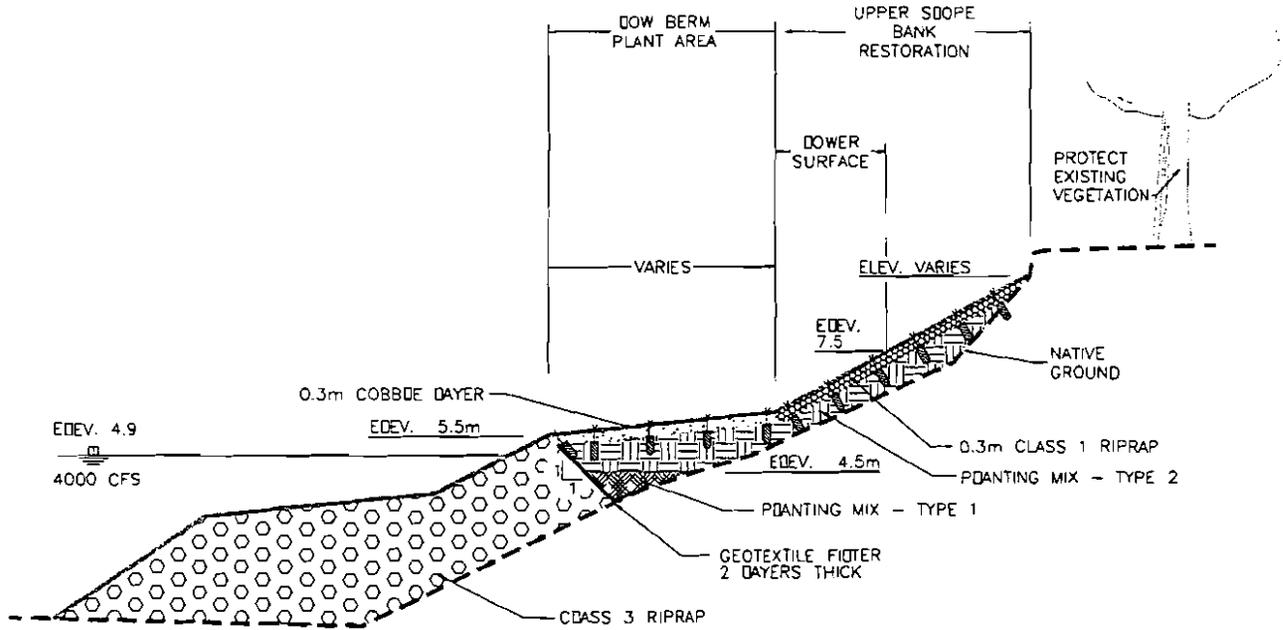
1. Survival rates are based on percentage of plants surviving based on the number of plants originally installed at final acceptance of project by the Federal Sponsor .
2. Canopy cover can be measured by percent of shoreline covered by vegetative canopy as measured from aerial photographs or by using sampling transects as shown on exhibit H & I;
3. Plant survival rates apply for tree species only, understory (shrub) and biotechnical plantings will not have survival rates measured.

EXHIBIT K

Typical Revetment Sections for Site 5 On-Site Mitigation



SITE 5 ONSITE MITIGATION PLANTING PROGRAM  
TYPICAL REVETMENT SECTION



SITE 5 ONSITE MITIGATION PLANTING PROGRAM  
TYPICAL REVETMENT SECTION

EXHIBIT L  
Unattached

Electronic Files of  
Plans and Specifications from

**“Original Construction Documents”**

**Bid Set**

Sacramento River Bank Protection Contract, Lower American River Site 5 Phase 2  
Onsite Mitigation Planting

Prepared for

U.S. Army corps of Engineers  
Sacramento District  
1325 J Street  
Sacramento, CA 95814

Contract No. DACW05-99- C-0016  
File No. 50-04-6096  
Spec No. 1040 Rev B

Prepared by

Northwest Hydraulic Consultants

## EXHIBIT M

Table of Environmental Commitments  
From  
Stream bank Protection for the Lower American River  
Final EIR and Supplemental EIR Statement V  
for the Sacramento River Bank Protection Project

**Non-Federal Local Sponsor:**

1. Ensure that revegetation meets objective criteria established in the Stream bank Protection for the Lower American River Final EIR and Supplemental EIR Statement V for the Sacramento River Bank Protection Project based on habitat evaluation procedures (HEP) analysis, for full mitigation of project impacts\*. This includes protecting establishing plants, planting media and the irrigation system from vandalism using security patrols as necessary during a 3 year plant establishment period.

**Federal Sponsor**

1. Conducting post-construction assessment of expected impacts on riparian habitat and SRA cover over the project life, and providing compensating mitigation if substantial net losses onsite are predicted
2. Survey for nesting raptors and bank swallows prior to any activity during the nesting season
3. Avoid disturbance of existing vegetation at each bank protection site to the degree possible consistent with the selected alternative.
4. Replace elderberry stems that cannot be avoided at a ratio determined in consultation with the Endangered Species Office of USFWS.
5. Ensure compliance during construction with local ordinances governing daily hours of construction activity.
6. Employ contractual provisions to prevent traffic safety, noise and air quality impacts from occurring.
7. Ensure compliance during construction with state requirements for stream turbidity monitoring and control
8. Stop work if buried cultural resources are encountered.

This list is provided for the sake of convenience and is condensed and abbreviated for the subject at hand. Refer to the Stream bank Protection for the Lower American River Final EIR and Supplemental EIR Statement V for the Sacramento River Bank Protection Project for comprehensive coverage of environmental commitments.

\*Site 5 on the Lower American River was constructed as part of emergency levee repair work and as such no base line hep study could be made. Mitigation for Site 5 is based on agreement between the Corps of Engineers and USFWS to fully mitigate impacts offsite.

**SUPPLEMENT TO  
STANDARD OPERATION & MAINTENANCE MANUAL  
SACRAMENTO RIVER  
FLOOD CONTROL PROJECT**

**AMERICAN RIVER  
FLOOD CONTROL PROJECT**

**Part No. 3 for  
Vegetation on Mitigation Sites  
CARMICHAEL BLUFFS DOWNSTREAM 8.3 MILES**



October 2000

**SACRAMENTO DISTRICT  
U.S. ARMY CORPS OF ENGINEERS  
SACRAMENTO, CALIFORNIA**

**CORPS OF ENGINEERS  
U.S. ARMY**

**SUPPLEMENT TO  
STANDARD OPERATIONS AND MAINTENANCE MANUAL  
SACRAMENTO RIVER FLOOD CONTROL PROJECT**

**AMERICAN RIVER FLOOD CONTROL PROJECT**

**PART NO. 3 for  
VEGETATION ON MITIGATION SITES  
CARMICHAEL BLUFFS DOWNSTREAM 8.3 MILES**

Sacramento District  
Corps of Engineers  
U.S. Army  
October 2000

SUPPLEMENT TO  
STANDARD OPERATION AND MAINTENANCE MANUAL  
SACRAMENTO RIVER FLOOD CONTROL PROJECT

AMERICAN RIVER FLOOD CONTROL PROJECT  
Part No. 3 FOR  
VEGETATION ON MITIGATION SITES  
CARMICHAEL BLUFFS DOWNSTREAM 8.3 MILES

TABLE OF CONTENTS

|   |           |
|---|-----------|
| <b>SECTION I - INTRODUCTION</b>   | <b>1</b>  |
| 1-01 Authority  | 1         |
| 1-02 Purpose of the Manual  | 1         |
| 1-03 Location and Description   | 1         |
| 1-05 Construction Data and Contractor                                   | 2         |
| <b>SECTION II - LOCAL COOPERATION</b>                                   | <b>3</b>  |
| 2-01 Federal Requirements   | 3         |
| 2-02 State Legislation (Non-Federal Requirements)                       | 3         |
| <b>SECTION III - GENERAL</b>  | <b>4</b>  |
| 3-05 Semi-annual (Annual) Report  | 4         |
| 3-09 Periodic Inspection (Semi-Annual)                                  | 4         |
| 3-10 Check Lists  | 4         |
| 3-11 Drawings   | 4         |
| <b>SECTION IX - VEGETATION ON MITIGATION AREAS</b>                      | <b>5</b>  |
| 9-01 Description  | 5         |
| 9-02 Establishment of Vegetation on the Mitigation Areas                | 5         |
| 9-03 Plant Establishment Period (Short Term Operations and Maintenance) | 5         |
| 9-04 Maintenance of the Mitigation Areas                                | 8         |
| 9-05 Management and Operation of the Mitigation Areas                   | 12        |
| 9-06 Vegetation Monitoring and Reporting                                | 13        |
| <b>REFERENCES</b>   | <b>18</b> |

SUPPLEMENT FORMAT & CONTENT

The organization and format of this exhibit is written to be consistent with the Standard Operations & Maintenance Manual for the Sacramento River Flood Control Project (Revised May 1955), and is intended to provide supplemental information that is not presently addressed.

## TABLES

Table 1 Sac Bank - Separable Element 42, Lower American River Site 5, \_\_\_\_\_2  
List of Site Acreage

## EXHIBITS

| <u>Exhibit</u> | <u>Description</u>   | <u>Location</u> |
|----------------|--|-----------------|
| A              | Flood Control Regulation (contained in Standard Manual)                          | Unattached      |
| A1             | Location Map   | 1 Sheet         |
| B              | “As Constructed” Drawings  | Unattached      |
| C              | Check List - Vegetation on Mitigation Area                                       | 1 Sheet         |
| D              | Letter of Transfer to or Acceptance by the Reclamation Board                     | Unattached      |
| E              | Pest Ratings of Noxious Weed Species & Noxious Weed Seed                         | in 8 Sheets     |
| F              | “As-Built” Final Report - Mitigation Planting, LAR, Separable Element 42, Site 5 | Unattached      |
| G              | Monthly Maintenance Log Form   | 1 Sheet         |
| H              | Example of Sampling Transect Locations   | 1 Sheet         |
| I              | Example of Rounding Out Plant Canopies for Line-Transect Measurements            | 1 Sheet         |
| J              | Performance Standards and Goals  | 1 Sheet         |
| K              | Typical Revetment Sections for Site 5 On-Site Mitigation                         | 1 Sheet         |
| L              | Original Construction Documents  | Unattached      |
| M              | Table of Environmental Commitments   | 1 Sheet         |

SUPPLEMENT TO THE  
STANDARD OPERATION AND MAINTENANCE MANUAL  
SACRAMENTO RIVER FLOOD CONTROL PROJECT

AMERICAN RIVER  
FLOOD CONTROL PROJECT

PART NO. 3 FOR  
VEGETATION ON MITIGATION SITES  
CARMICHAEL BLUFFS DOWNSTREAM 8.3 MILES

SECTION I

INTRODUCTION

**1-01 AUTHORITY**

This work was performed under the Second Phase of the Sacramento River Bank Protection Project, authorized by the Flood Control Act of 14 July 1960, Eighty Sixth Congress, Second Session, Senate Document No. 103. Project authorization was supplemented by the River Basin Monetary Authorization Act of 1974, approved by the Second Session of the 93<sup>rd</sup> Congress as Public Law 93-251. In 1982, the project authorization was further supplemented by a joint resolution of Congress as Public Law 97-377.

Additional information pertaining to authority for this project, project works, and the protection to be provided by this project are provided in the Standard Operations and Maintenance Manual and the Supplement To Standard Operation and Maintenance Manual, Sacramento River Flood Control Project, American River Flood Control Project, Carmichael Bluffs Downstream 8.3 Miles.

**1-02 PURPOSE OF THIS SUPPLEMENT:** This is a supplement, part 3, to the Sacramento River Flood Control Project Standard Operation and Maintenance Manual for the portion of the American River Flood Control Project from Carmichael Bluffs downstream 8.3 miles. This supplement is intended to provide information and guidance to maintenance personnel to the mitigation sites described herein. This supplement addresses vegetation on mitigation areas, including vegetation placed in rock revetment on berms, and does NOT address vegetation on levees. These guidelines reflect a change in the value and acceptance of certain vegetation within the flood control channel in light of changed environmental values and regulations. These guidelines shall be used in place of the Standard Operation and Maintenance Manual (1955) when managing mitigation sites. The 1955 Standard Operation and Maintenance Manual will continue to provide primary guidance for all public safety issues and decisions.

**1-03 LOCATION AND DESCRIPTION:**

a. Description of Mitigation Planting Surfaces In general, the revegetation program at each site was designed to establish a self-sustaining, mixed-canopy riparian forest and riparian scrub

habitat on waterside river bank berms. The revegetation program at each site also includes creating shaded riparian aquatic (SRA) habitat. Vegetation has been planted on a number of revetment planting surfaces and non-reveted planting surfaces. Each site and project may vary due to unique conditions and goals for each project or site.

(1) Site 5 On-site Mitigation (river mile 8.7 RT) is located on the north bank between Howe Avenue and Watt Avenue. It is about 1500 lineal feet in length. Bank protection and mitigation features at Site 5 were constructed in 1998 and 1999. Mitigation features include an irregular shore line, submerged low bench with fine textured instream woody material; an undulating, cobble lined, low berm surface; planting on the low berm surface and slope above; biotechnical plantings on rock tie backs in the low berm surface; and biotechnical plantings at the toe of the slope above the low berm surface.

(a) Low Berm. The low berm will provide a mixed-canopy riparian forest and provide SRA habitat, riparian mitigation, and erosion control. Woody riparian and herbaceous vegetation at site 5 was directly planted on a cobble-lined, low berm surface. The surface of the low berm undulates longitudinally in elevation providing a varied-depth surface, which will promote the establishment of a mixed riparian habitat. At Site 5 a soil trench extends beneath the berm and provides capillary water to plants during low flow periods.

(b) Bank Slope. The bank slope creates a mixed-canopy riparian habitat. The revetment surface of the bank slope consists of soil embankment and a 12inch thick layer of cobble. The bank slope varies and ranges in elevation. Trees and shrubs were planted in the soil embankment through the cobble layer. Lower slope elevations were planted with trees and shrubs that tolerate inundation and deposition and require more water.

The following table constitutes project sites, their location and the reclamation district or maintenance area within which they are located.

| Table 1<br>Sac Bank - Site 5 Mitigation<br>List of Site Acreage |                           |                      |                      |         |
|---|---------------------------|----------------------|----------------------|---------|
| Unit No.  | Site                      | Reclamation District | Existing vs New Berm | Acreage |
| NA  | Site 5, onsite Mitigation | ARFCD                | new                  | 0.7     |
| TOTAL FOR ALL SITES   |                           |                      |                      | 0.7     |

**1-05 CONSTRUCTION DATA AND CONTRACTOR:** The contractor and construction data for the project sites are listed in the following paragraphs.

a. Site 5, Onsite Mitigation

(1) Rockwork: Construction of Sacramento River Bank Protection Contract LAR 2, Site 5, Phase 1, onsite at the location as shown on Exhibit A-1, was accomplished under contract No. DACW05-99- C-0016 by AFA Construction, Inc., during the period from January 1999 to April

1999. File No. 50-04-6066 and Specifications No. 1040.

(2) Mitigation Planting: Construction of Sacramento River Bank Protection Contract, Lower American River Site 5, Phase 2, onsite mitigation at the location as shown on Exhibit A-1, was accomplished under contract No. DACW05-99- C-0016 by AFA Construction, Inc., during the period from September 1999 to November 1999. File No. 50-04-6066 and Specifications No. 1040.

## SECTION II

### LOCAL COOPERATION

**2-01 FEDERAL REQUIREMENTS:** Federal responsibility shall include the following:

a. Prepare the appropriate environmental documentation (EA or EIS), when requested by, and in cooperation with, the Non-Federal Sponsor. Coordinate with U.S. Fish & Wildlife Service and National Marine Fisheries Service and determine mitigation requirements in consultation with these agencies using the Habitat Evaluation Procedure or other methodology.

b. Prepare wildlife habitat mitigation design, oversee implementation, and ensure maintenance of plants has achieved root establishment and obtained other success criteria prior to turnover to Non-Federal Sponsor. Refer to Section 9-02 for exceptions.

c. Prepare a wildlife habitat mitigation report. This report shall document, with text, photographs and when appropriate, as built plans, existing conditions of site and plants at time of turnover to Non-Federal Sponsor. The report may be part of post construction reports required at the time of turnover to the Non-Federal Sponsor. The report shall be distributed to the Non-Federal Sponsor, the Corps' Environmental Resources Branch (CESPK-PD-R) and the Corps' Project Manager (CESPK-PM).

d. In joint responsibility with Non-Federal Sponsor, ensure that environmental commitments such as riparian mitigation measures and monitoring requirements are successfully implemented in accordance with National Environmental Policy Act (NEPA) and the Federal Endangered Species Act (ESA). (Refer to exhibit M for environmental commitments.)

e. Provide As-Constructed drawings.

f. Prepare project Operations & Maintenance Manual revisions as they apply to each mitigation project.

g. Coordinate appointment of a Mitigation Evaluation Team by the Army Corps of Engineers, the State of California Reclamation Board and the Sacramento Flood Control Agency in coordination with the U.S. Fish and Wildlife Service and the State Department of Fish and Game.

**2-02 STATE LEGISLATION (NON-FEDERAL REQUIREMENTS):** Non-Federal responsibility shall include the following:

a. Protect and preserve all mitigation vegetation on site that has been turned over to the Non-Federal Sponsor, including desirable vegetative growth as it "volunteers" throughout the life of the project. Allow vegetation to grow to maturity within mitigation areas.

b. Make semi-annual inspections and submit annual reports (which shall include text and a photographic documentation of plant progress). Refer to section 3-09.

c. Perform all operations, maintenance, monitoring and remedial requirements as stated herein.

d. Over the life of the project (as defined in the EA), replant and replace all vegetation that has died as a direct result of vandalism, public use (accidental damage) and negligent maintenance practices, for example, herbicide overspray, lack of beaver cage maintenance, and fire damage, other than 'Acts of God' to plants. All 'Acts of God' damage shall be revisited by all concerned agencies and decisions, relative to replanting, made on a case by case basis.

e. Refer to section 9-02 for a list of projects/sites that the Non-Federal Sponsor has agreed to take responsibility for the plant establishment period.

f. The local sponsor for each site listed in table 1, pg 2 are as follows:

(1) Site 5 On-site Mitigation: Reclamation Board. Contact the General Manager of the Reclamation Board through the California State Department of Water Resources.

### SECTION III

#### GENERAL

**3-05 ANNUAL REPORT:** The Non-Federal Sponsor shall prepare an annual report for the mitigation areas for submittal to the District Engineer. The Non-Federal Sponsor shall provide a copy of the report submitted to the District Engineer to the Corps' Environmental Resources Branch (CESPK-PD-R), and the Corps' Project Manager (CESPK-PM). The annual report shall compile information from the checklists that are prepared in coordination with the standard levee inspections during spring and fall. The annual report shall address all significant events that took place during the previous 12 months and shall include: the checklists, a photographic record of overall conditions, a photographic record of specific significant damage, service & maintenance records of all mechanical equipment, proposed corrective measures to deal with deficiencies, and a summary statement of general plant progress for the period of time from the preceding report.

**3-09 PERIODIC SEMI-ANNUAL INSPECTIONS:** Inspections of mitigation areas shall be initiated by the Non-Federal Sponsor and made with interested agencies at the times specified below to compare progress with the goals of the mitigation plans as stated in the environmental documentation and other project documents. Provide the Corps written notice 30 days prior to all inspections and invite the Corps to participate in the inspection.

a. Spring Inspection: At a minimum, inspection shall occur during April through June. Leaves emerge from buds at this time making it a good time for visual plant identification, and a good time for evaluating general plant health and mortality.

b. Fall Inspection: At a minimum inspection shall occur during September through October, just prior to the rainy season, typically when plant stress is most prevalent. Some plants may appear dead during this time of the year, but are actually alive. These plants may be exhibiting a

physiological response to stress, such as early leaf fall, during prolonged drought conditions. Therefore, survival counts taken during the spring inspection are generally more accurate.

**3-10 CHECK LISTS:** A specific check list form for reporting results of inspections of these mitigation areas is contained in this supplement as Exhibit C. These checklists shall be completed during each semi-annual inspection.

**3-11 DRAWINGS:** Exhibit B, As-built drawings (unattached).

**3-12 FINAL REPORTS:** Final Reports/Revegetation Project Summaries are provided as Exhibit F.

## SECTION IX

### VEGETATION ON MITIGATION AREAS

**9-01 DESCRIPTION:** This section addresses maintenance requirements for vegetation and associated items on the above mentioned mitigation areas. The contents in this exhibit are general in nature and apply to all mitigation project sites. Site-specific revisions to this exhibit addressing requirements unique to each site will be provided as new sites are completed. The format of revisions shall conform to, and be consistent with, this exhibit.

**9-02 ESTABLISHMENT OF VEGETATION ON THE MITIGATION AREAS:** For some projects the Non-Federal Sponsor has agreed to take on the "Establishment" responsibility of the vegetation. These projects shall include all effort, in addition to section 9-03 Plant Establishment Period (Short Term Operations and Maintenance), necessary to establish the vegetation. When required, the establishment of vegetation on the mitigation areas shall be specified in each revision to the exhibit. Refer to the following list for projects for which the Non Federal Sponsor has agreed to be responsible for the Plant Establishment Period:

- a. Site 5 onsite mitigation

**9-03 PLANT ESTABLISHMENT PERIOD (PEP), OR SHORT-TERM OPERATIONS AND MAINTENANCE** General. The PEP will start at the turnover of the project to the Non-Federal Sponsor and be a minimum of 36 months in duration if no significant replanting is required. Throughout this period, operations and maintenance requirements are expected to be relatively intense compared to the requirements of the following post-PEP. During the PEP, the Non-Federal Sponsor will be responsible for performing the operations and maintenance requirements listed below. At the end of the PEP, the mitigation sites will be considered successful if they are self-sustaining (refer to section 9-04) and provide adequate compensation as outlined in the performance standards (Exhibit J) to offset habitat losses associated with the project. If the performance standards are not met the Non-Federal Sponsor will consult with the mitigation evaluation team on possible remedial measures [refer to paragraph 2-06, e]. The Non-Federal Sponsor will be responsible for determining maintenance methods and schedules needed to perform these maintenance requirements. Operations and maintenance requirements of revegetation features during the PEP will include but are not limited to the following:

- a. Site assessments of overall planting areas to determine plant condition, weed growth, and other revegetation-related site conditions.

(1) Regular Inspections. The Non-Federal Sponsor will inspect mitigation areas. The inspections will be concurrent with maintenance activities during the PEP to ensure that plant materials are in a healthy and vigorous condition.

(2) Clean up. The Non-Federal Sponsor will maintain the site in a natural-appearing condition throughout the PEP. Site cleanup will occur on a weekly basis. All garbage, construction debris, excess plants, and dirt left over from replanting or site repair operations,

other discarded materials, and extraneous equipment will be removed from the site in accordance with state and local regulations.

(3) **Woody Debris and Felled Trees.** Natural woody debris (i.e., logs, branches, or uprooted trees), whether from mitigation plantings or other sources, shall not be removed, unless it poses a threat to public safety, including river users, or if it promotes local scour (i.e., movement or loss of stone or mats along bank protection features, including the upper slope, the low berm and low berm face).

(4) **Damage and Repair.** Maintenance, repair, or replacement of all revegetation features will be the responsibility of the Non-Federal Sponsor through the duration of the PEP. This includes maintenance, repair, or replacement of rock structures and erosion control measures required for mitigation habitat creation. Repair of rock structures and erosion control measures required for flood protection and public safety shall be governed by the standard operations and maintenance manual and subsequent supplements. Refer to section 1-01 and 1-02.

b. **Installation, maintenance, operation, and removal of the irrigation system at each site.**

(1) **Irrigation System.** The Non-Federal Sponsor will be responsible for the installation, operation, maintenance, and removal of the irrigation system and application of irrigation as described in the following paragraphs. The system must be capable of providing an adequate and equivalent quantity of irrigation to each planting site.

(a) **First Year irrigation schedule and Rate:** Each plant shall receive a minimum of one (1) application every seven (7) days during the months of April through October. Each application shall include a minimum of five (5) gallons per plant, or a sufficient quantity of water applied by overhead spray to uniformly wet the soil in the entire planting area to a minimum depth of 18 inches. Additional applications shall be required during November through March, if a minimum of 1/2 inch of precipitation does not fall on the plants during any six week period.

(b) **Second Year irrigation schedule and Rate:** Each plant shall receive a minimum of one (1) application every seven (7) days during the months of April through October. Each application shall include a minimum of fifteen (15) gallons per plant, or a sufficient quantity of water applied by overhead spray to uniformly wet the soil in the entire planting area to a minimum depth of 24 inches. Additional applications shall be required during November through March, if a minimum of 1/2 inch of precipitation does not fall on the plants during any six week period.

(c) **Third Year irrigation schedule and Rate:** Each plant shall receive a minimum of one (1) application every fourteen (14) days during the months of April through October. Each application shall include a minimum of thirty (30) gallons per plant, or a sufficient quantity of water applied by overhead spray to uniformly wet the soil in the entire planting area to a minimum depth of 36 inches. Additional applications shall be required during November through March, if a minimum of 1/2 inch of precipitation does not fall on the plants during any six week period.

If a new system is used, the Non-Federal Sponsor will install the entire system on the project site at the beginning of each irrigation season. At the end of each irrigation season, the Non-Federal Sponsor will remove the entire system from the project site. The Non-Federal Sponsor will be responsible for maintaining the irrigation system in a fully operational condition throughout the irrigation season defined herein. The Non-Federal Sponsor will hand water the plant materials when the irrigation system is not in place, if necessary, as determined by the Non-Federal Sponsor.

(2) Irrigation Season. The irrigation season will be April 1 through October 31 of each year of the PEP. The irrigation season may be adjusted at the Non-Federal Sponsor's discretion based on site-specific conditions (e.g., high or low water surface elevations, prolonged or delayed rainy seasons).

(3) Irrigation Applications. The beginning and shutdown dates for the irrigation schedule are dependent on weather conditions. If most of the plant material appears to be stressed (e.g., water stress [over-watering], stunted growth, wilting, premature leaf loss, and yellowing of leaves [deciduous spp.]) and in danger of perishing or becoming severely damaged, the Non-Federal Sponsor will adjust the frequency and duration of watering. The Non-Federal Sponsor will be responsible for applying irrigation at the rates specified in the original construction documents, or at a similar rate if a different irrigation system design is used.

#### c. Weed Control

(1) Requirements. Weed control will consist of hand-pulling, mechanical removal, or spot applications of herbicide to maintain a minimum 2-foot diameter weed-free zone around each individual planting location. Weeds will include all woody and herbaceous plants occurring within a 1-foot radius around each plant. Weed control may also involve the removal or control of particularly invasive non-native species outside of the 2-foot diameter around each plant. Refer to exhibit E for guidance and a list of weeds to be controlled. Weeds will also be controlled on all access roads and ramps.

(2) Herbicides. If herbicides are used, they will be non-selective, broad-spectrum, post-emergent, translocating herbicides approved for use in and around aquatic habitats by the U.S. Environmental Protection Agency. Herbicides, fertilizer, or other chemical-based materials will not be stored on the project site. Herbicides will be applied to avoid drift outside the designated revegetation planting areas and will protect existing plants to remain or to be transplanted from herbicide drift. Herbicides shall be applied in accordance with all State and local regulations.

(3) Elderberry (*Sambucus* sp.) plantings or naturally occurring elderberries. At no time will herbicides be sprayed onto undesired vegetation within 100 feet of any elderberry plantings or naturally occurring Elderberry plants at onsite or offsite mitigation planting areas. Although these plantings are not considered to be in a designated elderberry shrub mitigation site they will provide valley elderberry longhorn beetle (VELB) habitat. Weeds must be mechanically or manually within 100 feet of elderberry plants. However, in order to control particularly invasive non-native weed species (e.g., *Arundo donax*), where herbicide application is the only viable

means of weed eradication, herbicides may be applied by "painting" the cut stem or portions of the foliage. Minimal painting will occur to limit the quantity of applied herbicides. This method will be used as a means of preventing elderberry shrubs from competition from weed species.

(a) Elderberry plantings at Site 5 onsite mitigation: At the time of project construction, Site 5 was not considered to be an elderberry replacement area. Elderberry seedlings planted at Sites 5 were intended to enhance the riparian planting areas and not function as elderberry mitigation. Elderberry shrubs that have no stems greater than 1" in diameter and no exit holes are not subject to minimization measures under the USFWS conservation guidelines and may be removed by the Non Federal Local Sponsor. Elderberry shrubs planted as part of the mitigation plantings at site 5 onsite and removed by the Non Federal Local Sponsor shall be replaced by suitable species selected from the original plant list.

d Replacement Planting. Replacement of plant material, and/or implementation of other remedial measures, to meet performance standards in years 3 and 8. Replacement planting of woody or herbaceous plant material is required if there is high plant mortality and the site is not achieving, or is not trending toward achieving, the performance standards outlined in Section 9-05. Plant mortality may be the result of numerous factors, including but not limited to, acts of nature, site suitability for the species planted, or insufficient maintenance activities. The quantity of replacement plants during a given maintenance year, if necessary, will be determined based on the monitoring results and an estimation by the Non-Federal Sponsor of the quantity of plants required to meet the performance standards.

(1) Woody Plant Species. During the PEP, individual plant counts (summarized as percent survival values) will be performed for all woody plant material, with the exception of biotechnical installations of live cuttings for erosion control, such as brush layers and wattles. If individual plant counts are infeasible based on site conditions (e.g., dense vegetative growth) a cover based monitoring method will be used. The target performance goals for survival of woody plant material during years 1, 2, and 3 of the PEP are 70 percent, 60 percent and 50 percent survival, respectively, based on original population at time of turnover to the Non-Federal Sponsor. If the recommended performance goal for plant survival is not met, the Non-Federal Sponsor may elect to replant all or a portion of the planting sites needed to increase the percent survival to the required level.

Replacement planting will be performed in the fall or winter of each maintenance year. Plants of the same species and planting size as were originally installed will be installed unless it is determined that another species is better suited to a particular site condition. Replacement plants will be installed according to the original construction documents unless another viable alternative should be considered based on the cause of mortality or future site conditions. Dead plants will be completely removed before installation of replacement plants and will be removed from the site.

If replacement plants are required, all replacement plant propagation materials will be collected from local genetic stock from within the project site region as outlined in the original construction documents. Refer to Section 1-05 Construction Data and Contractor. Adjustments

to the original planting design will be recorded on the as-maintained drawing and in the annual reports.

(2) **Herbaceous Species on the Low Berm.** Herbaceous species on the low berm surface with sparse cover or bare areas greater than 25 square feet in area will be re-seeded with the original seed mix and application rates as specified in the original construction documents, refer to section 1-05 Construction Data and Contractor, modified as necessary, or re-plugged with container stock of the herbaceous plants originally installed. If an area has sparse or bare areas, but has an overstory of woody plant growth (e.g., willows, blackberries, native roses) reseeded/replanting will occur at the discretion of Non-Federal Sponsor. If significant loss of vegetation or damage to the site occurs, the Non-Federal Sponsor will discuss potential remedial measures with the mitigation evaluation team.

e. **Biotechnical plantings.** The integrity of the biotechnical plantings, which are a feature of some of the mitigation planting surfaces, shall be maintained during the PEP. This will include regularly checking the integrity of the wooden stakes and ensuring that the edges of erosion control blankets and mats are secure. The Non-Federal Sponsor will be responsible for repairing damage to the mat system caused by vandalism, fire, debris, or other causes during the PEP.

f. **Maintenance of signs.** The Non-Federal Sponsor will maintain the revegetation and VELB signs throughout the PEP. Maintenance will include replacing lost, stolen, or damaged signs; and performing any corrective actions required to maintain desired sign conditions.

g. **Preparation of project documentation, including submittals.** The Non-Federal Sponsor will be responsible for documenting project conditions and progress throughout the Plant Establishment Period (PEP). Documentation will include monthly maintenance logs, and annual monitoring reports, which are described in the following section.

(1) **Plant Establishment Form (Monthly Maintenance Log).** Throughout the PEP, the Non-Federal Sponsor will be responsible for daily (monthly logs) record keeping of the maintenance activities, including but not limited to irrigation, weed control (i.e., types of herbicides used, application rates, personnel performing work), and replacement planting. The Non-Federal Sponsor will compile all data recorded during the plant establishment activities on a form similar to the example in Exhibit G. The Non-Federal Sponsor will compile and present the forms for that year (one form for each month) in the annual reports Refer to page 4 paragraph 3-05 for requirements of the Annual Report.

h. **Providing site surveillance and other measures to protect vegetation from vandalism following installation and during the establishment period.**

**9- 04 MAINTENANCE OF THE MITIGATION AREAS (LONG TERM OPERATION AND MAINTENANCE):** Plants that have established themselves will continue to live without any artificial support by maintenance personnel. "Establishment" is defined herein as *"sustained self-sufficiency where the plant is able to sustain growth without additional artificial watering, fertilizing, herbicide spraying, weeding, pruning, cultivation, or other general maintenance practices normally associated with sustaining ornamental vegetation"*. The following items

address impacts that shall be addressed by, and are the responsibility of, the Non-Federal Sponsor in maintaining acceptable site and plant conditions so that vegetative growth will not be impeded. All maintenance activities, such as spraying and debris removal, shall be carried out in a manner which avoids impact to threatened and endangered species.

a. General Plant Care: "Park-like" conditions shall be avoided in the mitigation areas. Greater habitat value is afforded by those conditions that might be unsightly in a park situation, for example, downed trees, broken branches, unmowed grass, etc. No removal of vegetation shall occur without prior written approval from the Federal Sponsor except as defined below in paragraph d. Weed Control.

b. Tree Preservation: Preserve ALL existing trees on mitigation areas except as defined below in paragraph d. Weed Control. Only those trees that directly interfere with levee or revetment maintenance shall be removed.

c. Volunteer Growth: Preserve all native volunteer growth that is consistent with requirements and objectives of mitigation site plans and environmental documentation. The design concept on most sites includes developing the upperstory, which provides a seed source for most "successional growth" understory vegetation. The upperstory reduces the air and soil temperature, which creates a microenvironment at the understory level that is more conducive to volunteer growth. This design concept encourages, and is dependent upon, volunteer growth to achieve the objectives of the environmental documentation. Volunteer growth will achieve the regeneration of "successional growth" desired in mitigation plans required of most projects. Mowing these areas will suppress this growth and is not recommended. Ensure that all maintenance practices of adjoining lands do not negatively affect the mitigation site.

d. Weed Control: General weed control on the mitigation sites is not desirable and could cause more destruction to the desirable vegetation than the benefits received by its eradication. Whenever weed control is permitted, care shall be taken to isolate the spray (or other method if used) so that only the targeted plant is affected. Ensure weed growth is controlled on the firebreaks at each site. The maintenance districts will be allowed to control noxious weeds within the guidelines of the State of California, Department of Food and Agriculture, Division of Plant Industry. The maintenance district shall notify the Department of Water Resources, Flood Control Project Branch before taking any action. For guidance refer to, Pest Ratings of Noxious Weed Species and Noxious Weed Seed, Exhibit E. Herbicides shall be applied in accordance with all State and local regulations.

e. Selective Clearing/Pruning: Downed trees and branches, dead limbs, and dead trees provide habitat for numerous wildlife species. Therefore, clearing and pruning shall not occur unless such materials restrict site access from the ramps, prove to be detrimental to the integrity of the bank protection structure, present a risk to public safety, or overhang firebreaks. Pruning is permitted to maintain design hydraulic flows. Due to the different physical characteristics of mitigation sites, visual access of the levees shall be maintained. Levee slopes shall be visible from the levee tops.

f. Human Impacts: Some sites are located near population centers and are impacted by both

legitimate and non-legitimate uses. All damage as a result of these activities is the responsibility of the Non-Federal Sponsor and shall be repaired and replanted the by the Non-Federal Sponsor as required to meet environmental commitments. The following categorizes the greatest potential for damage from human impacts and shall be policed by the Non-Federal Sponsor:

(1) Public Use: The public's impact on a site will continue to be potentially disruptive to the vegetation. Ensure recreational activities do not impact the plants. If public use becomes destructive, the Non-Federal Sponsor shall take corrective measures to replace plants and to ensure their survival.

(2) Local Maintenance District Damage: Standard maintenance practices may pose a threat to the mitigation vegetation. Each district shall assess its present maintenance practices and determine if it can continue these practices or if it needs to adjust these methods to be less detrimental to the vegetation. Some traditional practices are not be appropriate for some sites and different methods shall be implemented. Local maintenance personnel are the people most involved with the sites on a day to day basis and therefore stand the greatest risk of inadvertently damaging them. Current levee maintenance practices, such as burning, can quickly destroy years of mitigation work, if maintenance procedures get out of control. The most common methods used to control vegetative growth on the levee structure (not the berm) are evaluated as follows:

- \* Mowing: Mowing is by far the safest method used to control vegetative growth and limit potential damage, and should be encouraged, where feasible.
- \* Discing: Discing is another preferred method, but is not as widely used due to its limited application to levee maintenance. Discing is most effective in maintaining a firebreak along the toe of the levee structure.
- \* Spraying: Chemical spraying is commonly used. Care shall be taken to prevent spray drift onto adjoining areas in accord with all applicable local, State and Federal laws.
- \* Burning: Burning is the least preferred. The potential for damage is great.

(3) Vandalism: Vandalism is always a potential threat but generally decreases over time. Most vandalism involves the theft of planting stock while young (usually the first year after planting). As the plant root systems develop, the plants become hard to remove, and are no longer a desirable target. Cutting of trees for firewood is another long-term threat. Vandalism damage to signs, fences, gates, and beaver barrier cages are long term problems and shall be repaired or replaced by the Non-Federal Sponsor in a timely fashion.

(4) Trash: Trash is disruptive to plant growth and wildlife. Trash shall be promptly removed from the site and discarded properly.

g. Wildlife and Domestic Animal Caused Damage: Beaver, deer, rabbit, and gopher damage is an ongoing threat to the vegetation. Beaver damage is the most common of these. On some

sites, beaver barrier cages have been installed to protect a percentage of the highly susceptible species and shall be checked at each inspection. Repair of these items shall be made on a timely basis to ensure further damage does not continue. These cages provide additional protection from deer browse. Even though small trees are the beavers' preferred food, they will damage the larger trees as well. Cottonwood and willows are the beavers' preferred species, however beavers are also known to fell other species of trees. The beaver barrier cages shall not be removed at any time, except when it would girdle the plant. Deer, rabbit, and gopher damage are prevalent while the vegetation is young but will have less of an impact over time. Wildlife damage is considered as an 'Act of God' and shall be revisited by all concerned agencies and decisions, relative to replanting, made on a case by case basis. Cattle, horses, sheep and goats shall be kept off the site and damage caused by domestic animals shall be the responsibility of the Non-Federal Sponsor.

h. Natural Environmental Damage: Natural processes are inevitable and could occur at any time during the course of re-establishing the vegetation. However, over time the damage will likely be less, due to the maturity of the vegetation. Windthrow of trees may increase over time as trees mature. All 'Acts of God' damage shall be revisited by all concerned agencies and decisions, relative to replanting, made on a case by case basis. Environmental damage caused by human impacts are events other than 'Acts of God' even though the results could be the same, i.e., a lightning fire versus a cigarette caused fire.

(1) Flood & Erosion: Flood and erosion damage could be an annual occurrence, such occurrences shall be documented in each annual report. Damage due to flooding will impact both vegetation and soil erosion.

(2) Fire & Wind: Fire and wind damage shall be documented in each annual report. Fire is a potential threat from both maintenance practices and public carelessness. Wind damage occasionally occurs but generally does not result in large-scale damage.

i. Vegetation Free Zone: Where applicable, the vegetation free zone is an area adjacent to the landside and/or waterside toe of the levee where no type of woody vegetation is permitted. This zone is required for maintenance and floodfighting activities and must be accessible at all times. Maintain a 15-foot-wide firebreak at the toe of the levee on all berm sites with average widths of 30 feet or greater and around perimeter of site where possible and so designated. Occasionally firebreaks have been provided on berms of less width and will be designated as such in the mitigation as-built drawings. Most berm sites less than 30 feet in width generally do not have a firebreak, due to lack of space. These firebreaks shall be kept clear of vegetative growth at all times. Tree limbs shall be pruned so that the air space above firebreak is also kept clear. Coordinate with and follow fire districts' recommendation for road maintenance and fire prevention.

j. Woody Debris and Felled Trees: Woody debris washing down the river during high flows tends to settle out as water levels recede. As a result, it is possible for debris or snags to accumulate in or around the bank protection features at the project sites. While there are certain advantages provided by such materials (e.g., wildlife habitat and shelter), the presence of woody debris can pose a threat to public safety. The issue of public safety will be the overriding

consideration for deciding when to remove debris and woody debris or felled trees will be removed at Non-Federal Sponsor's discretion.

k. **Beaver Barrier Cage, Signage, Fencing, and Access Gate Maintenance:** Beaver barrier cages and/or fencing have been provided on some of the mitigation areas. All cages and fences shall be maintained in an effective condition, which will deter beavers from damaging the vegetation. Signs and access gates shall be maintained in a readable and operable condition, respectively. Signs shall be checked annually. Any sign found to be damaged or unreadable shall be replaced or repaired to its original condition.

l. **Public Health and Safety:** Vegetation will be managed to meet operation, maintenance, repair, replacement and rehabilitation (OMRRR) requirements of authorized flood control and other authorized project features. Vegetative management may include partial or complete removal of vegetation for OMRRR purposes. Local maintenance entities shall coordinate with the Non-Federal Sponsor and receive the Non-Federal Sponsor's approval prior to undertaking any action.

m. **Other Miscellaneous Items:** Ensure access roads are kept in good passable order. Ensure that all other items associated with individual projects are maintained as per mitigation plans. Maintenance records of these items shall be presented as applicable in each annual report.

#### **9-05 MANAGEMENT AND OPERATION OF THE MITIGATION SITES (Adaptive Management)**

a. General. The operations and maintenance manual assumes the mitigation features will function as a self-sustaining established site, capable of natural regeneration and not requiring additional irrigation after the PEP. However, in the event of a structural failure, or if the vegetation fails to meet long-term performance standards or is otherwise in noncompliance with project requirements the procedures and standards required by this operations and maintenance manual may be insufficient or ineffective. In such cases, the mitigation evaluation team will be responsible for reviewing monitoring reports, evaluating results, and recommending remedial measures to be implemented by the Non-Federal Sponsor. This process is known as "Adaptive Management". The remedial measures would provide information for the repair, replacement, or rehabilitation of vegetation and structural features required for creation of mitigation habitat. Structural features required for flood control and public safety are governed by the standard operation and maintenance manual, refer to section 1-01 and 1-02..

Because the factors that might require remediation can not be identified specifically, some potential factors will be briefly summarized herein. If it should become necessary, more specific information pertaining to the cause of the problem and the proposed adaptive management technique will be prepared by the mitigation evaluation team.

b. Determination of the Need for Adaptive Management. The monitoring results and visual observations that are made during the annual and semi-annual inspections will determine noncompliance with long-term performance standards for all revegetation or problems regarding bank or other site features. The Non-Federal Sponsor will report this information to the

mitigation evaluation team. Based upon review of the report, the current understanding about system dynamics, current site conditions, and the project's performance standards, the mitigation evaluation team will recommend what actions, if any, may be required.

c. Selection of Critical Areas. The project site may be affected by a number of natural events or human impacts. Remedial action may be necessary throughout the revegetation areas or in specific areas. The selection of specific or critical areas will be based on the following considerations, or other factors not listed below that may effect project performance:

(1) After remediation, is the area capable of achieving self-sufficiency in a reasonable period of time?

(2) If original mortality was a result of inappropriate species composition within a microhabitat condition, would modifying the plant palette result in greater plant survival rates?

(3) If original mortality was a result of berm or bank failure, would modifying the structures result in greater survival rates?

d. Potential Reasons for Implementing Adaptive Management Actions. There are a number of possible circumstances that may require adaptive management actions. Such circumstances may include the following:

(1) Berm or bank failure resulting from high flow events or other causes.

(2) Excessive wildlife damage.

(3) Competition with invasive, non-native weed species.

(4) Human impacts, including vandalism, arson or inadvertent impacts.

(5) Natural events, such as floods or wildfire.

## **9-06. VEGETATION MONITORING AND REPORTING**

The goal of wildlife habitat mitigation projects is to create self-sustaining habitats per the specific requirements of the environmental documentation done in accordance with the National Environmental Policy Act (NEPA) and the U.S. Fish and Wildlife Service's biological opinion (if any) issued pursuant to the Federal Endangered Species Act (ESA) for that project. The mitigation will be considered self-sustaining if the site achieves, or is trending toward achieving, the performance standards at the end of the monitoring program and is determined successful in providing adequate compensation to offset losses from project construction. Vegetation monitoring will occur in June of each of the designated monitoring years.

Following mitigation project construction, the Corps will transfer the responsibilities for monitoring and reporting for the biological resources monitoring programs to the Non-Federal

Sponsor. Monitoring shall be supervised or conducted by a qualified biologist, botanist or habitat restoration specialist. The Non-Federal Sponsor shall be responsible for attaining the performance standards for the monitoring program.

a. **Performance Standards and Goals.** Performance standards are minimum vegetation reestablishment objectives that must be achieved in monitoring years designated in the monitoring schedule to meet project objectives. Failure to achieve performance standards may necessitate implementation of remedial measures to mitigate project impacts. In addition to performance standards for the completion of the PEP and at the end of the designated monitoring period, interim performance goals have been established for post PEP monitoring years as designated in the monitoring schedule to identify the need for management changes to improve the success of re-establishment of riparian vegetation and ensure compliance with performance standards at the end of the designated monitoring period. If implementation of remedial measures is required at, or towards the end of the monitoring period, monitoring would be performed for a least 5 years after measures are implemented. Refer to Exhibit J for performance standards.

b. **Monitoring Schedule.**

(1) **Site 5 onsite mitigation:** The site will be monitored in June in year 1, 2, 3, 5, 8 and 15, which will begin the year following installation of the mitigation features. For onsite mitigation, the monitoring period is expected to begin in June 2000 and end in year 2014.

(2) **Future Sites**

c. **Monitoring Methods.**

(1) **Site 5 onsite mitigation:** Individual plant counts will be used in monitoring years 1-3. In subsequent monitoring years tree canopy cover will be measured by aerial photography or, alternately by data collected along permanent transects to be established perpendicular to the riverbank. The transects will be sequentially numbered and established at 150-foot intervals starting from the upstream end of the project site and will extend the width of the project site (Exhibit H). The beginning and end of each transect will be permanently marked to allow replication of surveys in subsequent monitoring years. The monitors will measure the canopy width of trees and shrubs with foliage that intersects the transect line (Exhibit I). Percent tree canopy cover will be determined by measurement of the length of the transect intersected by overhanging tree cover.

(2) **Future Sites**

d. **Photographic Documentation.** A sufficient number of permanent photographic sampling points will be established by the Non-Federal Sponsor at each of the project sites so that a visual record of habitat development can be provided. The sampling points will be established during the first year monitoring surveys and the locations will be identified in the first year monitoring report. Photographs taken from each of these locations will be included in subsequent monitoring reports.

e. Monitoring Reports.

(1) Site 5 onsite mitigation: Annual monitoring reports for Site 5 onsite Mitigation shall be submitted to the Non-Federal Sponsor, the Corps' Environmental Resources Branch (CESPK-PD-R), and the Corps' Project Manager (CESPK-PM) by December 31 of each monitoring year. Monitoring is expected to begin in year 2000 and end in year 2007. Monitoring reports will include the following:

- (a) Aerial photographs taken for the survey (if used).
- (b) Percent tree canopy cover over each site.
- (c) Maps showing the survey transect locations (if used).
- (d) A summary of monitoring data for the project site by transects (if used).
- (e) Photographic documentation of site from permanent sampling points.
- (f) Qualitative description of the growth and vigor of vegetation.
- (g) A qualitative description of the low berm substrate and depositional features.
- (h) A qualitative description of the establishment of volunteer vegetation.
- (i) A description of how plantings are performing relative to performance standards and goals.
- (j) A description of how each species planted is performing.
- (k) A description of environmental factors that may be adversely affecting planting success.
- (l) A description of proposed and implemented remedial measures.

(2) Future Sites

f. Remedial Measures. If riparian vegetation reestablished on the project site fails to meet performance standards, mitigation may be required. The Mitigation Evaluation team will advise the Non federal sponsor as to specific remedial measures. The level of effort required will be determined based on the magnitude and causes of failure. Potential remedial measures that may be implemented to achieve performance standards include the following:

- (1) Planting additional plants at the project site.
- (2) Extending the irrigation period.

(3) Planting additional riparian plants at off-site locations.

If implementation of remedial measures is required, monitoring would be performed in the areas of the mitigation site affected by remedial measures for a 5-year period after measures are implemented.

## REFERENCES

- Jones & Stokes Associates, Inc, 1996. Adopted final environmental assessment and initial study of streambank protection at River Park - lower American River. June. (JSA 96-099.) Sacramento, CA. Prepared for U.S. Army Corps of Engineers, Sacramento District, Sacramento, CA, and State of California, The Reclamation Board, Sacramento, CA. With technical assistance from Ayres Associates, Fort Collins, CO.
- U.S. Army Corps of Engineers, 1955. Standard operation and maintenance manual for the Sacramento River flood protection project. Revised version. May. Prepared by the U.S. Army Corps of Engineers, Sacramento District, Sacramento, CA.
- U.S. Army Corps of Engineers, 1996. Addendum to the Standard Operation and Maintenance Manual for the Sacramento River Flood Protection Project. Revised version. October. Prepared by the U.S. Army Corps of Engineers, Sacramento District, Sacramento, CA.
- U.S. Army Corps of Engineers and State of California Reclamation Board 1998. Final. Environmental Impact Report and Supplemental Environmental Impact Statement V for the Sacramento River Bank Protection Project. March. Prepared by the U.S. Army Corps of Engineers, Sacramento District, Sacramento, CA; and State of California, The Reclamation Board, Sacramento, CA.

EXHIBIT A

**EXHIBIT A**

**FLOOD CONTROL REGULATIONS**  
**(See Standard Manual)**

**EXHIBIT A1**  
**LOCATION MAP**

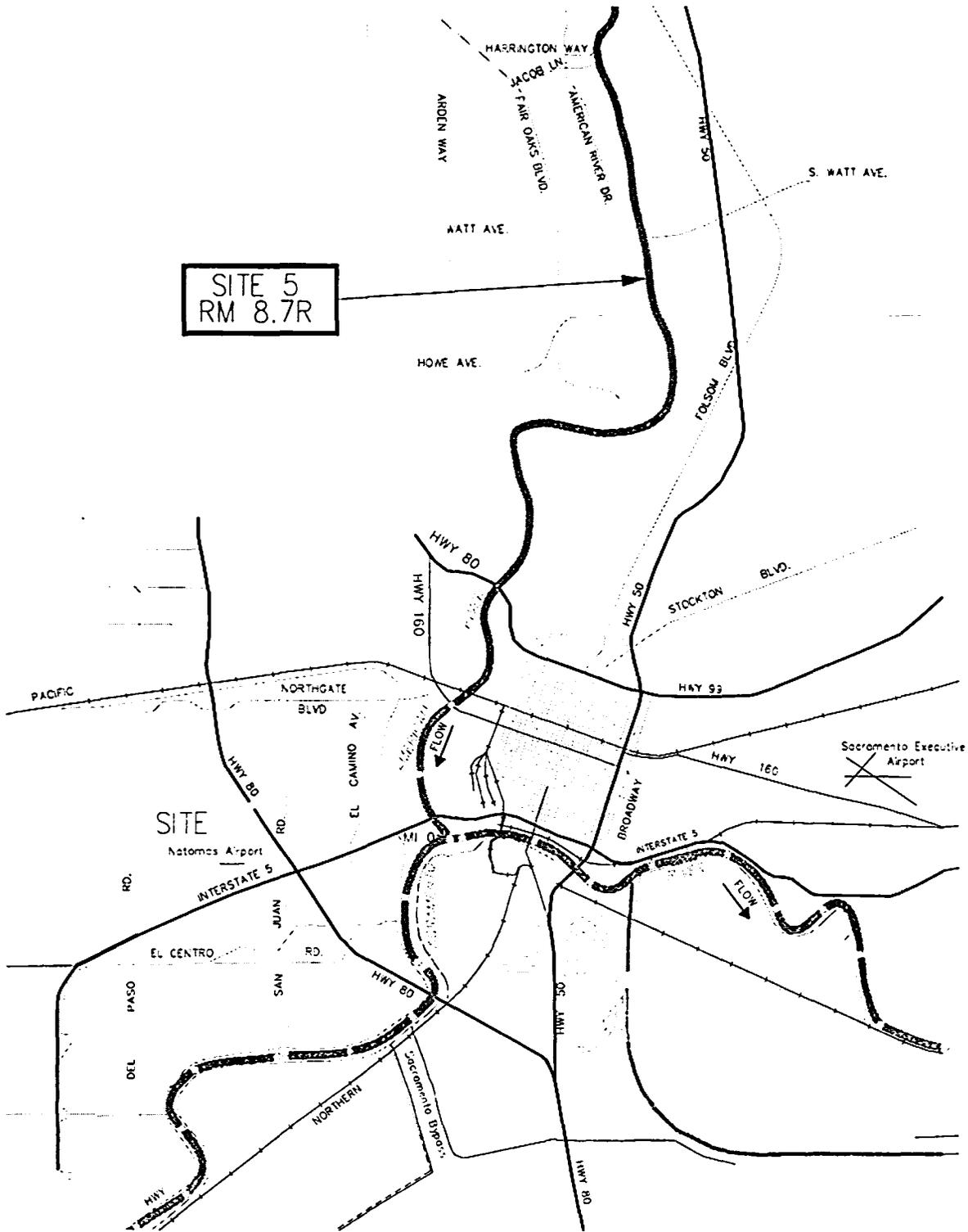


EXHIBIT B

**EXHIBIT B**

**"AS CONSTRUCTED" DRAWINGS**

SEE SEPARATE FOLDER FOR THE FOLLOWING DRAWINGS:

Title: Sacramento River Bank Protection Contract LAR 2, Site 5, Phase 1  
File No. 50-04-6066

Title: Sacramento River Bank Protection Project, Lower American River Site 5 Phase 2  
File No. 50-04-6066

ADDITIONAL DRAWINGS OF CROSS-SECTIONS, STRUCTURES, AND  
MISCELLANEOUS FACILITIES ARE AVAILABLE IN THE OFFICE OF THE DISTRICT  
ENGINEER.

EXHIBIT C

CHECK LIST NO. 1

VEGETATION ON MITIGATION AREA  
SEMI ANNUAL INSPECTION FORM

Location of Area Inspected: Part No. \_\_, Unit No.'s: \_\_\_\_\_ Date: \_\_\_\_\_  
(including river mile(s)) \_\_\_\_\_  
Inspected by: \_\_\_\_\_

Report below the condition of the site and those items requiring maintenance work. Opposite each item listed, indicate the appropriate response, yes or no, in the area provided. Provide an attachment, if necessary, describing the negative significant conditions and any proposed/implemented maintenance work for each item. Note any changes, positive or negative, from the previous inspections.

Reference O&M Unit No.

| Item No. | Description  | Response | Yes   | No*   |
|----------|--|----------|-------|-------|
| 1:       | Mitigation area erosion free .....                       | _____    | _____ | _____ |
| 2:       | Vegetation is free of fire damage .....                  | _____    | _____ | _____ |
| 3:       | Vegetation is free of flood damage .....                 | _____    | _____ | _____ |
| 4:       | Vegetation is free of wind damage.....                   | _____    | _____ | _____ |
| 5:       | Vegetation is free of herbicide damage.....              | _____    | _____ | _____ |
| 6:       | Vegetation is free of wildlife damage .....              | _____    | _____ | _____ |
| 7:       | Vegetation & equipment is free of vandalism.....         | _____    | _____ | _____ |
| 8:       | Site is free of trash.....                               | _____    | _____ | _____ |
| 9:       | Fire-break plowed and clear of growth .....              | _____    | _____ | _____ |
| 10:      | Access roads clear .....                                 | _____    | _____ | _____ |
| 11:      | Access gate barriers & locks in good working order ..... | _____    | _____ | _____ |
| 12:      | Beaver barrier cages or fencing in good condition .....  | _____    | _____ | _____ |
| 13:      | New volunteer growth (trees, shrubs) observed.....       | _____    | _____ | _____ |
| 14:      | Perimeter fencing in good working condition.....         | _____    | _____ | _____ |
| 15:      | Other items: _____                                       | _____    | _____ | _____ |

COMMENTS \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

\*Requires explanation

EXHIBIT D  
Unattached

EXHIBIT D

LETTER OF TRANSFER TO AND/OR ACCEPTANCE  
BY THE RECLAMATION BOARD

EXHIBIT E

STATE OF CALIFORNIA  
DEPARTMENT OF FOOD AND AGRICULTURE  
DIVISION OF PLANT INDUSTRY

PEST RATINGS OF NOXIOUS WEED SPECIES  
AND NOXIOUS WEED SEED

PURPOSE

To advise commissioners as to the Department's policy regarding any pest action.

DEFINITIONS

"A" An organism of known economic importance subject to state (or commissioner when acting as a state agent) enforced action involving: eradication, quarantine regulation, containment, rejection, or other holding action.

"B" An organism of known economic importance subject to: eradication, containment, control or other holding action at the discretion of the individual county agricultural commissioner.

or

An organism of known economic importance subject to state endorsed holding action and eradication only when found in a nursery.

"C" An organism subject to no state enforced action outside of nurseries except to retard spread. At the discretion of the commissioner.

GUIDANCE

The district will be allowed to control noxious weeds classified as "A" and identified by the Department of Food and Agriculture as "(an) organism of known economic importance to state (or commissioner when acting as a state agent) enforced action involving: eradication, quarantine regulation, containment, rejection, or other holding action."

The district will be allowed to control noxious weeds classified as "B" and identified by the Department of Food and Agriculture as (an) organism of known economic importance subject to: eradication, containment, control or other holding action at the discretion to the individual county agricultural commissioner.

Before the district eradicates any plant belonging to either class "A" or "B", the plant to be eradicated must be identified as a noxious weed in either class "A" or class "B" by a qualified biologist or a representative of the county agricultural commissioner's office. The district shall notify the Department of Water Resources, Flood Control Project Branch before taking action.

"A" SPECIES

*Eradication, containment, rejection or other holding action at the state-county level.  
Quarantine interceptions to be rejected or treated at any point in the state.*

|   |                                     |
|---|-------------------------------------|
| <u>Acaena anserinifolia</u>   | bidly bidly                         |
| <u>Acaena novae-zelandiae</u><br>(- <u>A anserinifolia</u> in part as<br>used previously and of British<br>and Australian authors.) | bidly bidly                         |
| <u>Acaena pallida</u><br>(- <u>A anserinifolia</u> in part<br>as used previously.)  | bidly bidly                         |
| <u>Achnatherum brachychaetum</u><br>(- <u>Stipa brachychaeta</u> )  | punagrass                           |
| <u>Albagi maurorum</u><br>(- <u>A pseudalhagi</u> )   | camelthorn                          |
| <u>Alternanthera philoxeroides</u>  | alligatorwood                       |
| <u>Arctotheca calendula</u>   | capeweed, as seed or fertile plants |
| <b>"A" - Pests Continued</b>  |                                     |
| <u>Carduus acanthoides</u>  | plumeless thistle                   |
| <u>Carduus nutans</u>   | musk thistle                        |
| <u>Carthamus leucocaulos</u>  | whitestem, distaff thistle          |
| <u>Centaurea diffusa</u>  | diffuse knapweed                    |
| <u>Centaurea iberica</u>  | Iberian starthistle                 |
| <u>Centaurea maculosa</u>   | spotted knapweed                    |
| <u>Centaurea squarrosa</u>  | squarrosa knapweed                  |

## EXHIBIT E

|   |                        |
|---|------------------------|
| <u>Chondrilla juncea</u>  | skeletonweed           |
| <u>Cirsium ochrocentrum</u>   | yellowspine thistle    |
| <u>Cirsium undulatum</u>  | wavyleaf thistle       |
| <u>Crupina vulgaris</u>   | bearded creeper        |
| <u>Cucumia melo</u> var. <u>dudain</u>  | dudain melon           |
| <u>Cuscuta reflexa</u>  | giant dodder           |
| <u>Euphorbia esula</u>  | leafy spurge           |
| <u>Euphorbia serrata</u>  | serrate spurge         |
| <u>Halimodendron halodendron</u>  | Russian salttree       |
| <u>Halogeton glomeratus</u>   | halogeton              |
| <u>Helianthus ciliaris</u>  | blueweed               |
| <u>Heteropogon contortus</u>  | tanglehead             |
| <u>Hydrilla verticillata</u>  | hydrilla               |
| <u>Linaria gonistifolia</u> spp. <u>dalmatica</u><br>(- <u>L. dalmatica</u> )   | Dalmatian, toadflax    |
| <b>"A" - Pests Continued</b>  |                        |
| <u>Onopordum</u> spp.   | onopordum thistles     |
| <u>Orobanche ludoviciana</u> var. <u>cooperi</u><br>(- <u>O cooperi</u> (Gray) Heller, as<br>used in Munz', A Flora of Southern<br>California.) | Cooper's<br>broomrape  |
| (- <u>O multiflora</u> Nutt., as used<br>in Correll and Johnston's Manual<br>of the Vascular Plants of Texas.)                                  | desert broomrape       |
| <u>Orobanche ramosa</u>   | branched, broomrape    |
| <u>Peganum harmala</u>  | harmel                 |
| <u>Physalis virginians</u> var. <u>sonorae</u><br>(- <u>p subglabrata</u> as used previously.)  | smooth<br>groundcherry |

EXHIBIT E

|   |                      |
|---|----------------------|
| <u>Prosopis strombulifera</u>                                       | creeping mesquite    |
| <u>Salsola vermiculata</u>  | wormleaf salsola     |
| <u>Salvia virgata</u><br>(- <u>S pratensis</u> as used previously.) | meadow sage          |
| <u>Scolymus hispanicus</u>  | golden thistle       |
| <u>Solanum cardiophyllum</u><br>nightshade                          | heartleaf            |
| <u>Solanum dimidiatum</u>   | Torrey's nightshade  |
| <u>Sonchus arvensis</u>   | perennial sowthistle |
| <u>Sphaerophysa salsula</u>   | Austrian peaweed     |
| <u>Striga lutea</u><br>(- <u>S asiatica</u> )                       | witchweed            |
| <u>Tagetes minuta</u>   | wild marigold        |
| <u>Zygophyllum fabago</u>   | Syrian beancaper     |

**"B" SPECIES**

*Eradication, containment, control or other holding action at the discretion of the commissioner.*

|   |                                |
|---|--------------------------------|
| <u>Acacia paradoxa</u><br>(- <u>A armata</u> )                                    | kangaroothorn                  |
| <u>Acronitlon repens</u><br>(- <u>Centaurea repens</u> )                          | Russian knapweed               |
| <u>Aegilops cylindrica</u>  | jointed goatgrass              |
| <u>Aegilops ovata</u><br>(- <u>A geniculata</u> and<br><u>A neglecta</u> in part) | ovate goatgrass                |
| <u>Aegilops triuncialis</u>   | barb goatgrass                 |
| <u>Aeschynomene rudis</u>   | rough jointvetch               |
| <u>Agropyron repens</u>   | (see <u>Elytrigia repens</u> ) |

|   |                                 |
|---|---------------------------------|
| <u>Allium paniculatum</u>                               | panicked onion                  |
| <u>Allium vineals</u>                                   | wild garlic                     |
| <u>Ambrosia trifida</u>                                 | giant ragweed                   |
| <u>Araujia sericofera</u>                               | bladderflower                   |
| <u>Cardaria chalepensis</u>                             | lens-podded hoarycress          |
| <u>Cardaria drabs</u>                                   | heart-poddedhoarycress          |
| <u>Cardaria pubescens</u>                               | globe-podded hoarycress         |
| <u>Carthamus baeticus</u>                               | smooth distaff thistle          |
| <u>Carthamus lanatus</u>                                | woolly distaff thistle          |
| <u>Centaurea calcitrapa</u>                             | Purple starthistle              |
| <u>Centaurea repens</u><br>"B" - <i>Pests continued</i> | (See <u>Acroptilon repens</u> ) |
| <u>Centaurea sulphurea</u>                              | Sicilian thistle                |
| <u>Chorispora tenella</u>                               | purple mustard                  |
| <u>Cirsium arvense</u>                                  | Canada thistle                  |
| <u>Coronopus squamatus</u>                              | swinecress                      |
| <u>Cucumis myriocarpus</u>                              | paddy melon                     |
| <u>Cynara cardunculus</u>                               | artichoke thistle               |
| <u>Cyperus esculentus</u>                               | yellow nutsedge                 |
| <u>Cyperus rotundus</u>                                 | purple nutsedge                 |
| <u>Elytrigia repens</u><br>(- <u>Agropyron repens</u> ) | quackgrass                      |
| <u>Euphorbia oblongata</u>                              | oblong spurge                   |
| <u>Gaura coccinea</u>                                   | scarlet gaura                   |
| <u>Gaura drummondii</u>                                 | scented gaura                   |

(- G odorata)Gaura sinuata

wavyleaf gaura

Gypsophila paniculata

baby's breath

Imperata brevifolia

satintail

Isatis tinctoria

dyer's woad

Lepidium latifolium

perennial peppergrass

Lythrum salicaria

purple loosetrife

Muhlenbergia schreberi

nimblewill

Nothoscordum inodorum

false garlic

**"B" - Pests continued**Nymphaea mexicana

banana waterlily

Oryza rufipogon

red rice

Panicum antidotale

blue panicgrass

Physalis viscosa

grape groundcherry

Polygonum cuspidatum

Japanese

Polygonum polystachyum

Himalayan knotweed

Polygonum sachalinonae

giant knotweed

Rorippa austriaca

Austrian fieldcress

Salvia aethiopsis

Mediterranean sage

Senecio Jacobaea

tansy ragwort

Senecio squalidus

Oxford ragwort

Sesbania punicea

Scarlet Wisteria, Rattlebox

Setaria faberi

giant foxtail

Solanum carolinense

Carolina horsenettle, knotweed

Solanum elaeagnifolium

white horsenettle

EXHIBIT E

|                            |                           |
|----------------------------|---------------------------|
| <u>Solanum lanceolatum</u> | lanceleaf nightshade      |
| <u>Solanum marginatum</u>  | white-margined nightshade |
| <u>Symphytum asperum</u>   | rough comfrey             |
| <u>Ulex europaeus</u>      | gorse                     |
| <u>Viscum album</u>        | European mistletoe        |

"C" SPECIES

*State endorsed holding action and eradication only when found in a nursery; action to retard spread outside of nurseries at the discretion of the commissioner; reject only when found in a cropseed for planting or at the discretion of the commissioner.*

|   |                    |
|---|--------------------|
| <u>Carduus pycnocephalus</u>  | Italian thistle    |
| <u>Carduus tenuiflorus</u>  | Italian thistle    |
| <u>Cenchrus echinatus</u>   | Southern sandbur   |
| <u>Cenchrus incertus</u>  | coast sandbur      |
| <u>Cenchrus longispinus</u><br>(- <u>C pauciflorus</u> as<br>used previously) | mat sandbur        |
| <u>Centaurea solstitialis</u>   | yellow starthistle |

\*\*\*\*\*

**“As-Built”**

**Final Report**

**Sacramento River Bank Protection Contract, Lower American River Site 5 Phase 2  
Onsite Mitigation Planting**

**Prepared for**

**U.S. Army corps of Engineers  
Sacramento District  
1325 J Street  
Sacramento, CA 95814**

**Contract No. DACW05-99- C-0016**

**Prepared by**

**(\_\_\_\_\_), Principal**

**(Contractor's Company Name  
Address &  
Phone No.)**

**(\_\_Date\_\_)**

EXHIBIT G

Exhibit G. Sample Format for Daily Log Form  
Plant Establishment Form to Record Irrigation, Weed Control, and Plant Mortality

Project: \_\_\_\_\_ Sheet no. \_\_\_\_\_ of \_\_\_\_\_

Note: Designate river and river mile for site location. Check or indicate the appropriate responses.

|   |                     |                     |                   |                 |                |                |  |
|---|---------------------|---------------------|-------------------|-----------------|----------------|----------------|--|
| Date _____                              |                     | Site Location _____ |                   |                 |                |                |  |
| Purpose of Visit                        | inspection          | irrigation          | weeding           | mowing          | repair         | census         |  |
| weather conditions                      | cloudy              | rainy               | clear             | hot             | warm/mild      | cool           |  |
| irrigation info                         | flushed system      | repairs             | duration/amount   | personnel _____ |                |                |  |
| Weed Control                            | chemical type _____ |                     | manual            | personnel _____ |                |                |  |
| Damage to                               | fences/gates        | beaver cages        | irrigation equip. | signs           | plants         | other _____    |  |
| Damage from                             | vandalism           | flood               | fire              | herbicide       | wildlife _____ |                |  |
|   | livestock           | RD work _____       |                   | other _____     |                |                |  |
| Plant Mortality                         | species _____       | quantity _____      | species _____     | quantity _____  | species _____  | Quantity _____ |  |
|   | species _____       | quantity _____      | species _____     | quantity _____  | species _____  | Quantity _____ |  |
| Items to be addressed next visit _____  |                     |                     |                   |                 |                |                |  |
| Problems, Observations, Comments: _____ |                     |                     |                   |                 |                |                |  |

|   |                     |                     |                   |                 |                |                |  |
|---|---------------------|---------------------|-------------------|-----------------|----------------|----------------|--|
| Date _____                              |                     | Site Location _____ |                   |                 |                |                |  |
| Purpose of Visit                        | inspection          | irrigation          | weeding           | mowing          | repair         | census         |  |
| weather conditions                      | cloudy              | rainy               | clear             | hot             | warm/mild      | cool           |  |
| irrigation info                         | flushed system      | repairs             | duration/amount   | personnel _____ |                |                |  |
| Weed Control                            | chemical type _____ |                     | manual            | personnel _____ |                |                |  |
| Damage to                               | fences/gates        | beaver cages        | irrigation equip. | signs           | plants         | other _____    |  |
| Damage from                             | vandalism           | flood               | fire              | herbicide       | wildlife _____ |                |  |
|   | livestock           | RD work _____       |                   | other _____     |                |                |  |
| Plant Mortality                         | species _____       | quantity _____      | species _____     | quantity _____  | species _____  | Quantity _____ |  |
|   | species _____       | quantity _____      | species _____     | quantity _____  | species _____  | Quantity _____ |  |
| Items to be addressed next visit _____  |                     |                     |                   |                 |                |                |  |
| Problems, Observations, Comments: _____ |                     |                     |                   |                 |                |                |  |

**EXHIBIT H**

**EXAMPLE OF SAMPLING  
TRANSECT LOCATIONS**

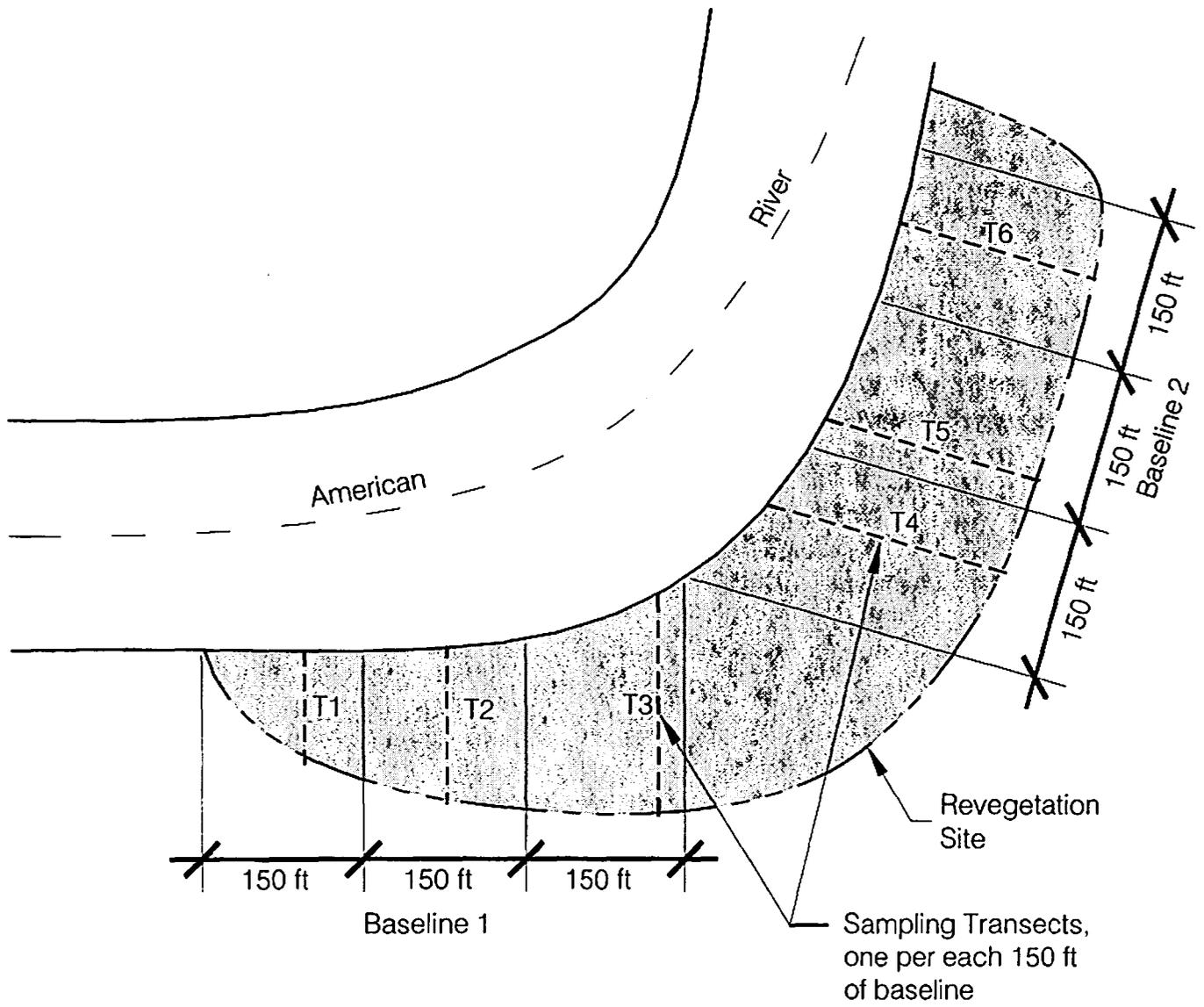
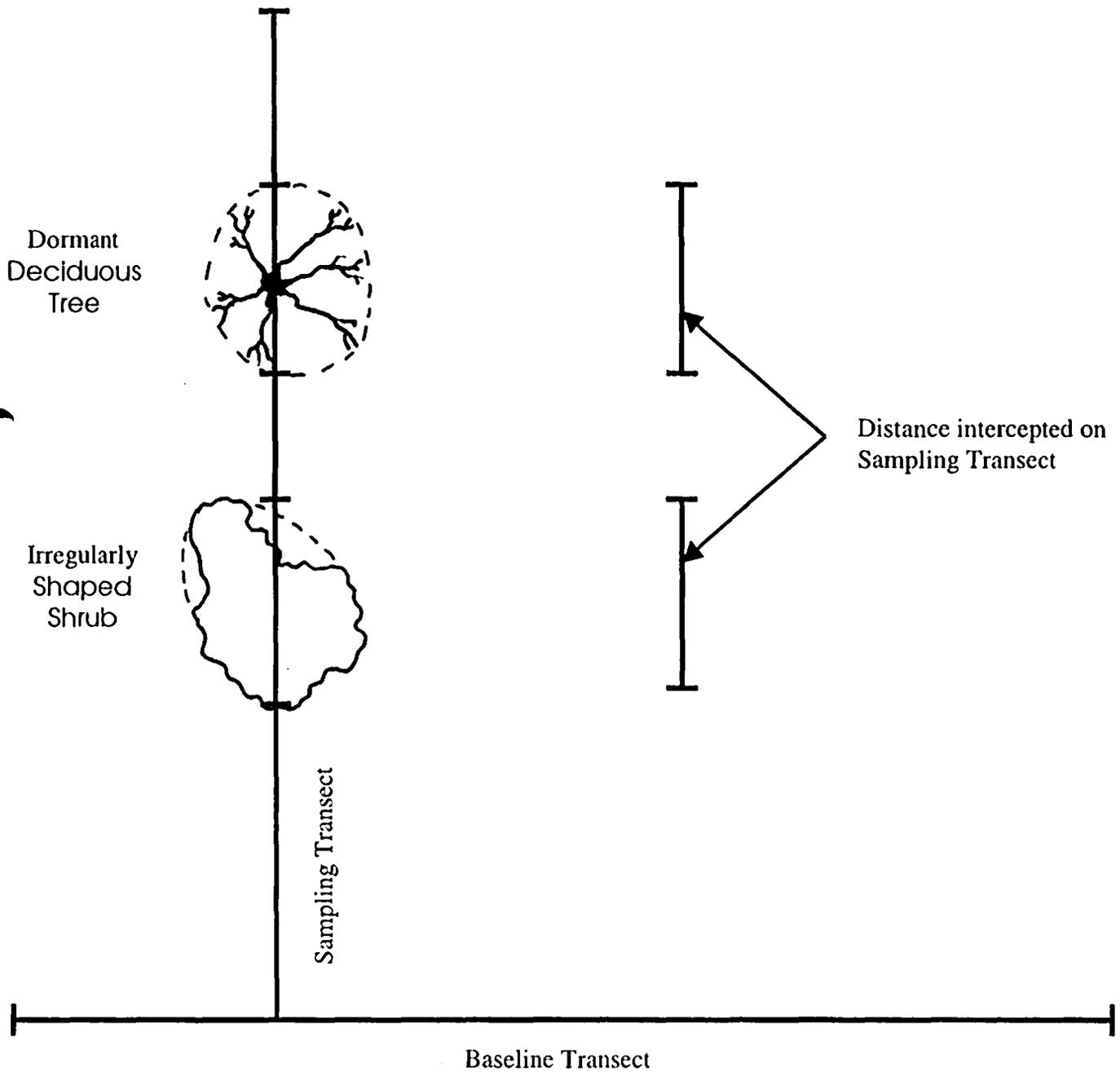


EXHIBIT I

EXAMPLE OF ROUNDING OUT PLANT CANOPIES FOR  
LINE-TRANSECT MEASUREMENTS



## EXHIBIT J

## Performance Standards and Recommended Performance Goals for Site 5 Onsite Mitigation

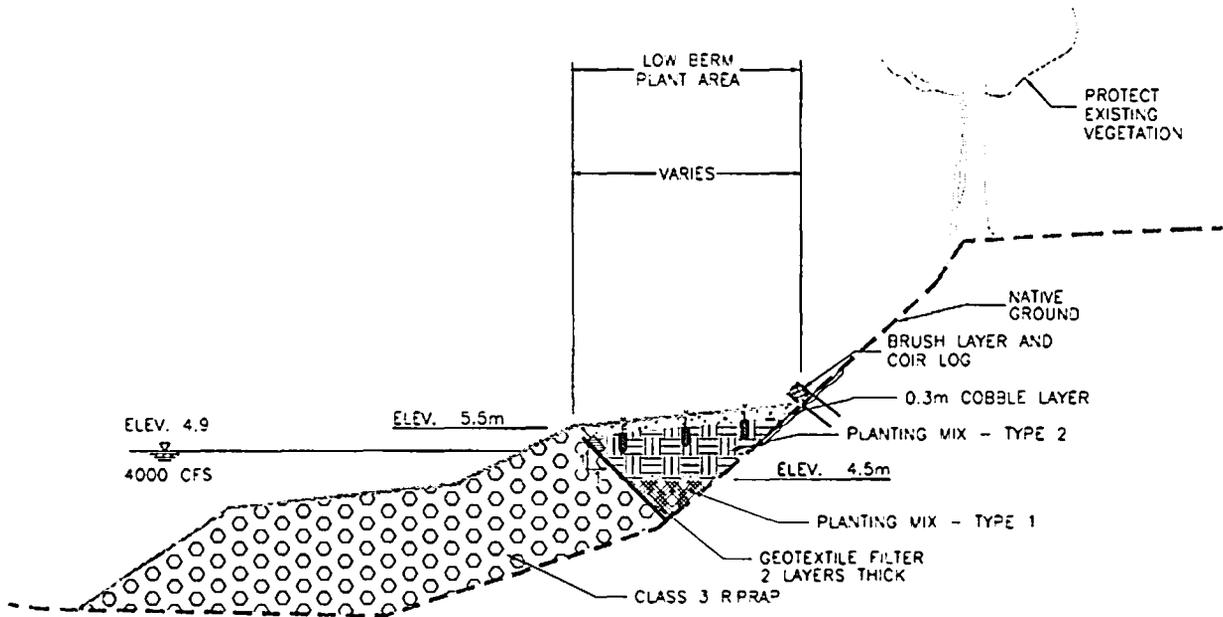
## Site 5 Mitigation Performance Standards

| monitoring regime    | plant establishment period |        |        | post establishment period |        |         |
|----------------------|----------------------------|--------|--------|---------------------------|--------|---------|
| performance criteria | survival rate              |        |        | canopy cover              |        |         |
| monitoring year      | year 1                     | year 2 | year 3 | year 5                    | year 8 | year 15 |
| percentage required  | 70%                        | 60%    | 50%    | 15%                       | 30%    | 60%     |

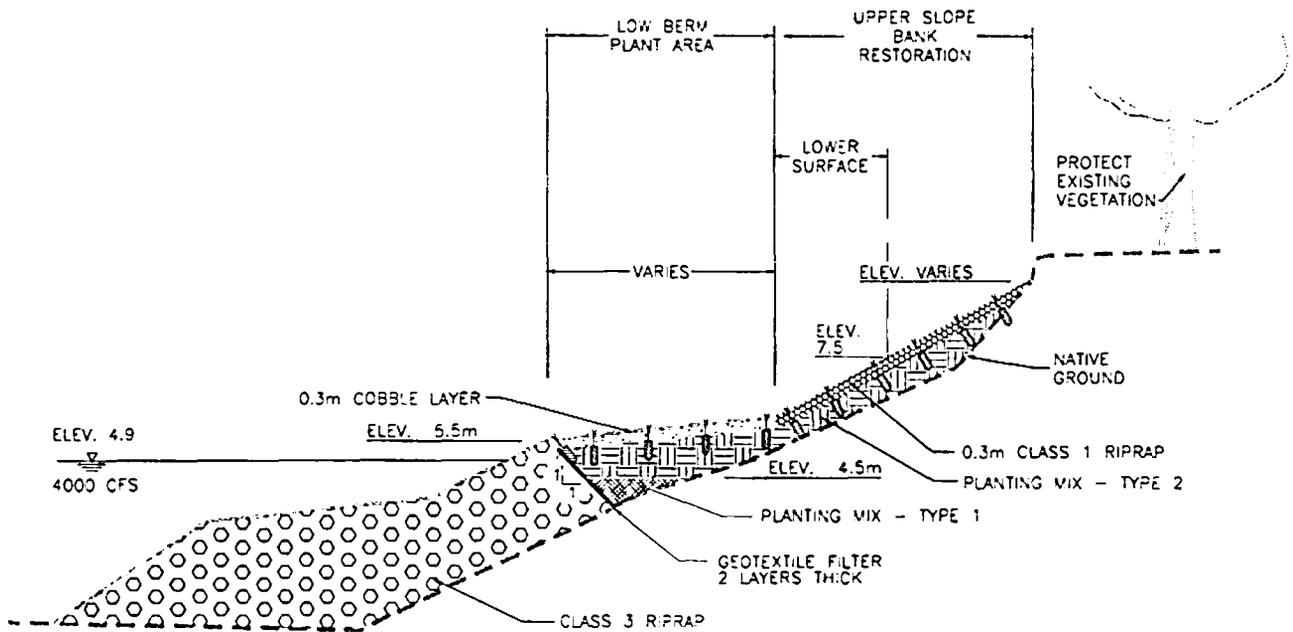
1. Survival rates are based on percentage of plants surviving based on the number of plants originally installed at final acceptance of project by the Federal Sponsor .
2. Canopy cover can be measured by percent of shoreline covered by vegetative canopy as measured from aerial photographs or by using sampling transects as shown on exhibit H &I;

EXHIBIT K

Typical Revetment Sections for Site 5 On-Site Mitigation



SITE 5 ONSITE MITIGATION PLANTING PROGRAM  
TYPICAL REVETMENT SECTION



SITE 5 ONSITE MITIGATION PLANTING PROGRAM  
TYPICAL REVETMENT SECTION

EXHIBIT L  
Unattached

Electronic Files of  
Plans and Specifications from

**“Original Construction Documents”**

**Bid Set**

Sacramento River Bank Protection Contract, Lower American River Site 5 Phase 2  
Onsite Mitigation Planting

Prepared for

U.S. Army corps of Engineers  
Sacramento District  
1325 J Street  
Sacramento, CA 95814

Contract No. DACW05-99- C-0016  
File No. 50-04-6096  
Spec No. 1040 Rev B

Prepared by

Northwest Hydraulic Consultants

## EXHIBIT M

**Table of Environmental Commitments  
From  
Stream bank Protection for the Lower American River  
Final EIR and Supplemental EIR Statement V  
for the Sacramento River Bank Protection Project**

**Non-Federal Local Sponsor:**

1. Ensure that revegetation meets objective criteria established in the Stream bank Protection for the Lower American River Final EIR and Supplemental EIR Statement V for the Sacramento River Bank Protection Project based on habitat evaluation procedures (HEP) analysis, for full mitigation of project impacts\*. This includes protecting establishing plants, planting media and the irrigation system from vandalism using security patrols as necessary during a 3 year plant establishment period.

**Federal Sponsor**

1. Conducting post-construction assessment of expected impacts on riparian habitat and SRA cover over the project life, and providing compensating mitigation if substantial net losses onsite are predicted
2. Survey for nesting raptors and bank swallows prior to any activity during the nesting season
3. Avoid disturbance of existing vegetation at each bank protection site to the degree possible consistent with the selected alternative.
4. Replace elderberry stems that cannot be avoided at a ratio determined in consultation with the Endangered Species Office of USFWS.
5. Ensure compliance during construction with local ordinances governing daily hours of construction activity.
6. Employ contractual provisions to prevent traffic safety, noise and air quality impacts from occurring.
7. Ensure compliance during construction with state requirements for stream turbidity monitoring and control
8. Stop work if buried cultural resources are encountered.

This list is provided for the sake of convenience and is condensed and abbreviated for the subject at hand. Refer to the Stream bank Protection for the Lower American River Final EIR and Supplemental EIR Statement V for the Sacramento River Bank Protection Project for comprehensive coverage of environmental commitments.

\*Site 5 on the Lower American River was constructed as part of emergency levee repair work and as such no base line hep study could be made. Mitigation for Site 5 is based on agreement between the Corps of Engineers and USFWS to fully mitigate impacts offsite.