

SFCTA Contract Number 06/07-29

Caltrans EA Number 04-163701

DOYLE DRIVE REPLACEMENT PROJECT Biological Monitoring Program

August 2009 (Updated May 2010)

Prepared By:

Arup PB Joint Venture

San Francisco County
Transportation Authority

**Doyle Drive
Replacement Project**

Biological Monitoring
Program

August 2009 (Updated May 2010)

Table of Contents

1.0	Introduction	1
1.1	Training	4
1.2	Tailgate Meeting.....	4
2.0	Biological Monitoring Tasks	4
3.0	Special-Status Birds	5
3.1	Biological Monitor Responsibility	6
3.1.1	Pre-Construction Nest Surveys	6
3.1.2	Measures Undertaken of Active Bird Nests	7
3.1.3	Reporting	8
3.2	Caltrans Biologist Responsibilities	9
3.3	Construction Personnel Responsibilities.....	9
3.4	Special Circumstances	10
3.4.1	Pile Driving.....	10
3.5	Night Lighting	10
3.5.1	Mitigation / Minimization.....	10
3.5.2	Night-Lighting Survey and Monitoring.....	10
3.6	Noise.....	11
3.6.1	Monitoring at Crissy Marsh.....	11
4.0	Vegetation Protection (Non-wetland)	12
4.1	Mitigation / Avoidance.....	12
4.2	ESA Avoidance and Monitoring	12
5.0	Invasive Plant Species.....	13
5.1	Vehicle Use and Maintenance.....	13
5.2	Earth-moving and Erosion-control	13
5.3	Maintenance.....	13
5.4	Monitoring and Implementing Maintenance.....	13
6.0	Special-Status Plant Species (Non-wetland)	13
6.1	Mitigation / Avoidance.....	15
6.2	Surveying and Monitoring.....	15
6.3	Reporting	15
7.0	Additional Sensitive Species	16
7.1	Tree Lupin Moth.....	16
7.1.1	Avoidance, Mitigation and Monitoring.....	16
7.2	Bats.....	16
7.2.1	Surveys.....	16
7.2.2	Monitoring and Reporting.....	16
8.0	Revegetation.....	17
8.1	Maintenance (Contractor).....	17
8.2	Biological Monitor Responsibilities.....	18

8.3	Vegetation Sampling Methods.....	18
8.3.1	Qualitative Sampling	18
8.3.2	Quantitative Sampling.....	19
8.3.3	Multiple-Hit Point Intercept Sampling.....	19
8.3.4	Data Analysis.....	21
8.3.5	Success Criteria	21
8.4	Reporting.....	22

Tables

1.	Threatened, Endangered, or Bird Species of Special Concern with Some Potential to Nest within or Adjacent to the Doyle Drive Construction Corridor	5
2.	Bird Species with Potential Non-Breeding Occurrence within or Adjacent to the Doyle Drive Construction Corridor.....	6
3.	Potential Special-Status Plant Species	14

1.0 Introduction

The Doyle Drive Monitoring Program is designed to ensure that biological monitoring is effectively administered and results in the avoidance and minimization of adverse impacts to sensitive resources throughout the duration of construction activities associated with the Doyle Drive Project. It also provides measures for situations where resource protection standards are not met; response procedures and chain-of-command protocol are detailed below to aid in the rapid deployment of corrective action or adaptive management for such circumstances.

The measures identified in the Monitoring Program will be implemented for restoration activities for the Doyle Drive Replacement Project; the parameters of which are identified in contract specifications. Implementation of the Monitoring Program will involve several principle parties, which are listed below.

Caltrans Biologist

The Caltrans Biologist will oversee all aspects of the Monitoring Program that require field implementation. This person will interact directly with the Monitoring Lead/Biological Monitors and will notify the Resident Engineer when an activity is causing concerns, and may need to be modified or stopped.

The Caltrans Biologist will be the focal contact for applicable agencies (e.g. California Department of Fish and Game (CDFG), U.S. Fish and Wildlife Service (USFWS), Presidio Trust (Trust), National Park Service (NPS) - Golden Gate National Recreation Area (GGNRA)).

Resident Engineer

The Resident Engineer is the focal point for contact with the Contractor. The Caltrans Biologist will direct all construction-related concerns to the Resident Engineer.

The Resident Engineer can halt construction in the event that the Caltrans Biologist or construction personnel provide notification of adequate reason for such action. The Resident Engineer will also be responsible for corrective action if the Caltrans Biologist provides documentation that corrective action is needed.

Monitoring Lead

The Monitoring Lead will coordinate the work of the Biological Monitors and will act as the liaison between Caltrans Biologists and the Monitors. The Monitoring Lead will coordinate monitoring activities, manage/schedule Biological Monitors, review and provide Quality Control on all Biological Monitor submittals before their ultimate submittal to the Caltrans Biologist.

The Monitoring Lead will also be responsible for scheduling environmental training of construction personnel and will maintain the list of employees that have attended training.

Biological Monitors

The Biological Monitors will be qualified biologists who meet a set of established professional criteria for the specific resource that the individuals are surveying or

monitoring. Each Biological Monitor shall possess: (1) a 4-year college degree in Biology or Environmental Sciences and (2) a minimum of one year's experience in the applicable biological wildlife surveys/monitoring or botanical surveys/monitoring. The Monitors will be able to identify plant and wildlife species and nesting bird activity, as applies to the task at hand. The Monitors will be responsible for the following (in summary):

- completing surveys where required;
- monitoring construction activities and active construction zones as apply to biological resource protection;
- completing biological monitoring memoranda for each day spent monitoring construction and more detailed reports when applicable;
- recording contractor compliance/non-compliance with the measures described in the following sections; and
- administering the environmental training sessions to construction personnel.

If the Biological Monitor finds that an individual or contractor is violating any of the Caltrans' biological specifications, the monitor will notify the Monitoring Lead to initiate corrective action procedures. The monitors will immediately call the Caltrans Biologist if the Monitoring Lead is unavailable for any reason. The Caltrans Biologist (or the Monitoring Lead if Caltrans biologists are unavailable) will inform the Resident Engineer of the need for corrective action.

In addition, the monitor will submit a Biological Compliance Advisory, which will be attached to the memorandum or report for the day. The advisory will be submitted to the Monitoring Lead before it is forwarded to the Caltrans Biologist for review. Caltrans will then submit the advisory to the Trust.

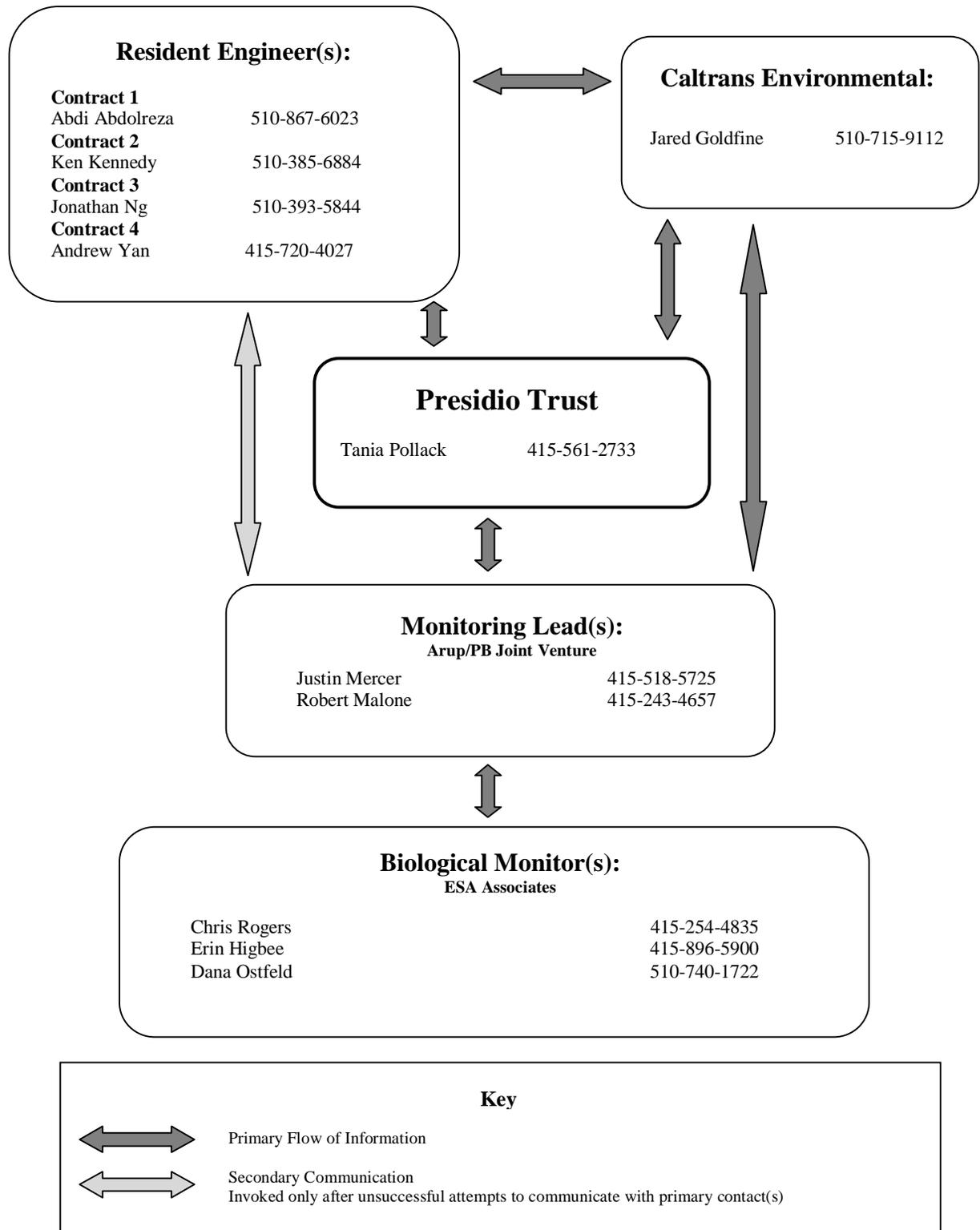
Contractor/Construction Personnel

The contractor is responsible for constructing fencing or flagging Environmentally Sensitive Areas (ESAs), maintaining the integrity of ESAs, and keeping vehicles and personnel out of restricted areas. In addition, the contractor and construction personnel will attend training sessions prior to starting work on-site. Following completion of training, construction personnel will sign a training attendance sheet. Construction personnel that are added to a job after the formal training session will complete training at the next available session.

Presidio Trust/National Park Service

An advisory/review group (Trust Review Group) composed of Presidio Trust (Trust) and National Park Service (NPS) staff will be created and kept informed of all biological monitoring activities by the Monitoring Lead and/or Caltrans Biologist. The Trust Review Group will be provided copies of all monitoring reports/memoranda, consult on mitigation implementation, and assist in construction personnel training prior to the start of work activities.

Hierarchical Communication Structure



1.1 Training

At a minimum, construction personnel will attend one pre-construction training session. This session will:

- present information provided by the Trust and NPS on working with these agencies and within national parks, such as strict trash containment requirements and the prohibition on feeding wildlife.
- establish a common understanding of the Monitoring Program and the communication procedures.
- inform all personnel of environmental regulations and penalties and applicable State and Federal Laws.
- serve as the meeting where a “wallet card” with pictures and contact instructions are distributed.
- identify relevant special-status species.
- identify Best Management Practices as indicated in the final specifications prepared for each construction contract regarding measures such as erosion control and invasive species control, when applicable.
- cover avoidance and reporting criteria for active bird nests, ESAs, wetlands, etc., to communicate the concepts of the monitoring efforts conducted during construction, how to report relevant information, and who to report it to.

A project environmental kick-off meeting for all management-level project staff will be held prior to initiation of construction monitoring.

1.2 Tailgate Meetings

Tailgate meetings will be coordinated by the Monitor to address key environmental issues relevant to particular work crews or locations or new information that comes to light.

Tailgate meetings will address site-specific issues, including:

- an introduction to applicable State and Federal Laws
- known sensitive resource areas (i.e. nest buffer zones or ESAs)
- repeated or uncorrected non-compliance events
- discovery of a sensitive resource that requires special protection measure

2.0 Biological Monitoring Tasks

The specific tasks and procedures associated with biological monitoring for the project are detailed below for specific resources, not including wetland mitigation and monitoring which will be provided in a separate report.

3.0 Special-Status Birds

All species and subspecies of the families listed in the Migratory Bird Treaty Act (MBTA), and their nests, are protected resources. Additional species may be granted ‘special-concern’ status by federal, state, or local entities. Many of the birds that may nest in the construction

corridor are protected either by the MBTA or California State Fish and Game Code 503. Table 1, provided below, lists bird species that could nest in the Doyle Drive construction area that would be protected in addition to species listed in the MBTA. Table 2 lists those endangered, threatened, or special-status bird species with the potential for non-breeding occurrence within or adjacent to the Doyle Drive construction corridor.

Trees and shrubs that will be removed as part of the Doyle Drive Construction Project will be removed during the non-nesting season (August 1 – December 31) when possible.

Active nests of migratory and special status birds will be avoided with a buffer of 30 meters (100 feet) from construction activities. For raptor nests, the buffer from construction activities will be 91 meters (300 feet).

Clearing and grubbing will be allowed only if the area is surveyed and it is determined that nesting birds are not present or are outside of defined buffer areas. Surveys must occur no more than five days prior to initiation of work.

Table 1. Threatened, Endangered, or Bird Species of Special Concern with Some Potential to Nest within or Adjacent to the Doyle Drive Construction Corridor			
Common Name	Scientific Name	Potential Doyle Drive Related Nesting Habitat	Nesting Period
Federal/State Threatened or Endangered			
western snowy plover	<i>Charadrius alexandrinus nivosus</i>	Margins of Saltwater Marshes/Beaches	
willow flycatcher	<i>Empidonax traillii extimus</i>	Central Coast Arroyo Willow Scrub / Northern Coastal Bluff Scrub	May - August
little willow flycatcher	<i>Empidonax traillii brewsteri</i>	Central Coast Arroyo Willow Scrub / Northern Coastal Bluff Scrub	May - August
California Species of Special Concern			
Cooper's Hawk	<i>Accipiter cooperi</i>	Historic Forest	April - September
great horned owl	<i>Bubo virginianus</i>	Historic Forest	December - April
red-tailed hawk	<i>Buteo jamaicensis</i>	Historic Forest	February - June
red-shouldered hawk	<i>Buteo lineatus</i>	Historic Forest	April - July
Olive-sided flycatcher	<i>Contopus cooperi</i>	Historic Forest	April - October
California yellow warbler	<i>Dendroica petechia brewsteri</i>	Wetlands / Central Coast Arroyo Willow Scrub	April - August (June peak)
American kestrel	<i>Falco sparverius</i>	Historic Forest	April - August
saltmarsh common yellowthroat	<i>Geothlypis trichas sinuosa</i>	Freshwater/Saltwater Marshes	April - August
long-billed curlew	<i>Numenius americanus</i>	Margins of Saltwater Marshes	April - September
western screech-owl	<i>Otus kennecottii</i>	Historic Forest	February - June
black-headed grosbeak	<i>Pheucticus melanocephalus</i>	Central Coast Arroyo Willow Scrub / Historic Forest	April - August
rufous hummingbird	<i>Selasphorus rufus</i>	Central Coast Arroyo Willow Scrub / Non-Native Introduced Forest	April - July
Allen's hummingbird	<i>Selasphorus sasin</i>	Central Coast Arroyo Willow Scrub / Northern Coastal Bluff Scrub	February - August (April peak)

Species of Local Concern or Locally Rare Species			
California quail	<i>Callipepla californica</i>	Central Coast Arroyo Willow Scrub / Northern Coastal Bluff Scrub / Grasses	May - July
Spotted towhee	<i>Pipilo maculatus</i>	Central Coast Arroyo Willow Scrub / Northern Coastal Bluff Scrub / Historic Forest	April - August
Bewick's wren	<i>Thryomanes bewickii</i>	Potentially throughout, any cavity	February - August

Table 2. Bird Species with Potential Non-Breeding Occurrence within or Adjacent to the Doyle Drive Construction Corridor	
Marbled murrelet	<i>Brachyramphus marmoratus</i>
American peregrine falcon	<i>Falco peregrinus anatum</i>
bald eagle	<i>Haliaeetus leucocephalus</i>
brown pelican	<i>Pelecanus occidentalis californicus</i>
California least tern	<i>Sterna antillarum browni</i>
black turnstone	<i>Arenaria melanocephala</i>
Vaux's swift	<i>Chaetura vauxi</i>
black oystercatcher	<i>Haematopus bachmani</i>
harlequin duck	<i>Histrionicus histrionicus</i>
marbled godwit	<i>Limosa fedoa</i>
whimbrel	<i>Numenius phaeopus</i>
double-crested cormorant	<i>Phalacrocorax auritus</i>
elegant tern	<i>Sterna elegans</i>
California gull	<i>Larus californicus</i>
ferruginous hawk	<i>Buteo regalis</i>

3.1 Biological Monitor Responsibilities

The Biological Monitor will be responsible for completing surveys, monitoring construction activities, completing monitoring reports, and forwarding information regarding active nests associated with the Doyle Drive Replacement Project construction corridor and buffer areas to the Caltrans Biologist and the Monitoring Lead.

The Biological Monitor will include requirements for avoidance and minimization of impact to birds as well as training in the identification of sensitive bird species and key nesting behaviors as part of the biological training sessions.

3.1.1 Pre-Construction Nesting Surveys

- A. In the event that construction activities will occur during the bird-nesting season (January 1 – July 31 for tree-related work and March 1 – July 31 for any other vegetation in the Presidio), a Biological Monitor will survey the construction area footprint and a buffer area for nesting activity or juvenile (pre-fledge) birds. Surveys will be conducted prior to any construction activity and within five calendar days of

the commencement of such activity. Evidence of nesting activity includes any of the following activities:

1. copulations;
 2. carrying material to build nests within the survey area;
 3. carrying food or feeding young;
 4. carrying fecal sacks away from nest;
 5. mate-feeding; repeated "bee-line" flying to likely nest site;
 6. observation of nest;
 7. observation of chicks;
 8. females giving call or chip notes alerting their mate that they are off the nest;
 9. auditory evidence of chicks.
- B. In addition, the biological monitor will survey a buffer area that extends 91 meters (300 feet) from the boundary of proposed construction area for the existence of nesting or pre-fledge birds prior to any construction activity and within five calendar days of the commencement of such activity. If an active nest is present, the Trust Review Group shall be notified.
- C. Starting January 1 and concluding July 31; nesting surveys will be conducted weekly, at a minimum, throughout the active construction areas. The biological monitor will survey all active construction areas and buffers areas adjacent to active construction in addition to areas where construction is scheduled to occur.
- D. If a nest is initiated after an area has been surveyed and construction has been permitted (see Section 2.1.2), the Trust Review Group shall be notified. The Trust and Caltrans shall work together to assess the feasibility of mitigation measures to protect the nest.
- E. For discovery of the nesting wrenit (*Chamaea fasciata*), a species of local concern, the Trust Review Group would be contacted immediately to discuss potential protective measures. The project proponents would avoid and minimize direct impacts to the extent practicable without implementing work stoppage measures. Such protective measures could include ESA fencing implementation that would surround the nest and the greatest buffer area feasible without delaying construction activity.

3.1.2 Measures Undertaken for Active Bird Nests

- A. The Trust Review Group will be contacted within one business day of protected nesting bird discovery to initiate consultation. CDFG and/or USFWS will be contacted within one business day for threatened or endangered nesting birds encountered.
- B. If a protected bird species is observed nesting within 100 feet (non-raptor) or 300 feet (raptor species) of the nearest (or projected) work site, the biological monitor will prepare a monitoring plan that will be reviewed by the Caltrans Biologist and Presidio Trust; CDFG and/or USFWS will review plans for threatened and endangered species.

- C. During the development of the monitoring plan, the nesting area and buffer area will be avoided. An ESA will be implemented immediately for the nesting site. The ESA will include the nesting site and an additional buffer of 30 meters (100 feet) for non-raptor species or 91 meters (300 feet) for raptors.
- D. The ESA will not be entered into until: 1) the Trust Review Group have agreed to the monitoring plan or 2) the Monitor has determined that the juvenile birds have fully fledged and left the area or the nest has failed and the area has been resurveyed to verify the absence of bird species involved in any process of the breeding cycle.
- E. Avoidance and minimization measures may be adjusted only after consultation with the Trust Review Group (for all protected species) and/or CDFG (for threatened/endangered species).
- F. The Biological Monitor will monitor the construction of all ESAs to ensure proper placement and buffer area inclusion.
- G. The Biological Monitor will survey the ESAs weekly to ensure the integrity of the structures and their effectiveness in keeping people, vehicles, or equipment out of the sensitive area.
- H. The Resident Engineer, with input from the Caltrans Biologist, may halt construction in a given area if avoidance measures are not adhered to or if surveys discover special-status bird species that will be impacted by construction.
- I. Indications of significant disturbance to nesting birds that fall within the ESA may generate further consultation with the Trust Review Group. On a case-by-case basis, buffer, the adequacy of buffer widths will be addressed with input from the Biological Monitor. Buffer widths may be adjusted following consultation with the Trust Review Group and CDFG/USFWS (for threatened or endangered species). The adequacy of buffer widths varies with species discovered and circumstances of the construction area

3.1.3 Reporting

- A. The Biological Monitor will write and submit memoranda for all surveying and monitoring activity within seven days of the event. Memoranda will be submitted to the Monitoring Lead and then forwarded to the Caltrans Biologist who will forward it to the Trust Review Group for review.
- B. The Biological Monitor will write and submit an annual report by the 30th day of January for the previous monitoring year. The report will be submitted to the Monitoring Lead for review, before submittal to the Caltrans Biologist who will forward it to Trust Review Group, or other appropriate agencies.
- C. The Biological Monitor will write and submit additional protocol to the Caltrans Biologist and Monitoring Lead if required for compliance with CDFG and/or USFWS.

Reports will contain:

- 1. monitor's name, survey/monitoring date and time period, and areas surveyed/monitored;

2. survey/monitoring methodology, an account of the monitoring, and results of monitoring;
3. a summary of all bird avoidance and impact minimization measures implemented at the site(s), if applicable;
4. a summary of construction activity in the survey/monitoring area;
5. an account of the presence/absence of special status bird species within or adjacent to construction activities and the number of individuals;
6. a list of all bird species observed in the survey area;
7. the location of observed nests, as well as activities that indicate possible or probable nesting;
8. the current stage of the nesting cycle (i.e. parents carrying food, nestlings observed, etc.);
9. the distance of individual special status bird species and/or nests from construction activity;
10. the behaviors and activities of birds, especially any behavior seemingly in response to construction; and
11. an account of any disturbance or incidental take of threatened/endangered species/species of special concern during construction (take applies to threatened/endangered species only).

3.2 Caltrans Biologist Responsibilities

- A. The Caltrans Biologist is responsible for coordinating with the Resident Engineer (and resource agencies, if applicable) regarding compliance with resource protection measures of the Project.
- B. The Caltrans Biologist will communicate with the Resident Engineer when compliance with avoidance/mitigation measures requires additional ESA construction or requires a temporary halting of construction activity.

3.3 Construction Personnel Responsibilities

- A. Construction personnel will be required to attend training that specifies their responsibilities regarding avoidance and minimization measures required for sensitive bird species or any nesting bird prior to starting work on the project.
- B. Should the contractor's workers encounter an active bird nest in the construction area, they are required to notify the Biological Monitor, Monitoring Lead or the Caltrans Biologist before any action is taken that might impact the bird. Construction will commence only after the adequate protection measures have been implemented and the Resident Engineer has given permission for the resumption of work.
- C. Construction personnel will notify the Caltrans Biologist or the Monitoring Lead if any injured bird species are encountered. The Caltrans Biologist/Monitoring Lead will notify the Trust Review Group if any injured bird species are encountered.
- D. The Resident Engineer may inform construction personnel that work must be halted to address restrictions necessary to prevent impacts to nesting birds.

- E. Construction personnel may not enter established ESAs for any reason.

3.4 Special Circumstance

3.4.1 Pile Driving

Noise from conventional pile-driving may impact breeding birds. Pile-driving will be restricted to a period outside the bird breeding season (January 1 through July 31 for the Presidio).

If this restriction proves impracticable, the Caltrans Biologist (with input from the Monitoring Lead), will consult with the Trust Review Group to determine sufficient mitigation and monitoring criteria. Pile driving will be permitted during the bird-nesting season only after a *mitigation and monitoring plan* that specifically addresses the issue has been submitted to and agreed upon by the Trust/NPS.

3.5 Night-Lighting

There are potential adverse impacts to migratory birds and bats from night-lighting serving as an attractant to the species.

3.5.1 Mitigation/Minimization

Construction areas set-up for nighttime activity and requiring lights will implement the following measures as long as the safety of workers is not reduced:

- A. All construction related lighting should be fully shielded and focused down to the maximum extent feasible to ensure no significant illumination passes beyond the immediate work area. If it is determined that it would be impossible for a specific construction task to satisfy this requirement, the Contractor shall request and receive authorization in writing from the Resident Engineer who shall consult with the Trust Review Group before granting an authorization to proceed.
- B. Yellow or orange light will be used when possible.
- C. Construction personnel will reduce the amount of lighting to the minimum necessary to safely accomplish the work.
- D. Night construction near ESAs of nesting birds will be avoided during bird nesting season (January 1 – July 31), to the maximum extent possible. If night construction near ESAs cannot be avoided, light will not be allowed to shine directly into ESAs.
- E. Construction areas set-up for night time activity are subject to all of the same pre-construction surveys, weekly nesting season surveys, and avoidance/minimization measures as all other construction areas listed in this report.

3.5.2 Night-Lighting Survey and Monitoring

- A. Prior to, and no more than five days before night-time construction activities, a Biological Monitor will survey construction areas, including areas within the buffer (pursuant to Section 2.2.1), that are set-up for night time construction activity.

- A. The Biological Monitor will re-survey the area within the first week of operations for the given site.
- B. The Monitor will survey nighttime construction activities on a monthly basis, or twice monthly for sensitive areas (as determined by the Trust Review Group), for a 1 – 2 hour period, if construction activities will be conducted at night on a regular basis. The monitor will survey the site to:
 - 1. ensure that the Caltrans night-lighting specifications are adhered to;
 - 2. monitor bird and bat activity at the construction site;
 - 3. report the behavior of birds and/or bats in the area, and report impacts to the species; and
 - 4. ensure that no direct light escapes into the Crissy Marsh area.
- C. The Biological Monitor will prepare and provide memoranda to the Monitoring Lead after each monitoring event.
- D. Upon the completion of three (3) monitoring events, the Biological Monitor will prepare a report for submittal to the Monitoring Lead for review and subsequently the Caltrans Biologist before the ultimate submittal to the Trust Review Group.
- E. If no significant impacts are observed, the Monitoring Lead will revisit this monitoring protocol with the Trust Review Group, for a determination of the necessity of nighttime monitoring.

3.6 Noise

During the course of construction, standard noise attenuation on construction equipment will be employed. Work will adhere to the noise control specifications found in the Caltrans Standard Specifications and Caltrans Standard and Special Specifications. The best available noise control techniques will be used to the extent practicable on construction equipment and trucks. Equipment will be properly maintained and equipped with exhaust mufflers that meet state standards. Impact tools should be fitted with sound attenuating equipment where feasible and practicable. If feasible, excessively noisy activities will be limited to time frames where noise impacts are reduced or performed outside of the breeding periods.

3.6.1 Biological Noise Monitoring

- A. Biological Monitors will conduct two baseline bird surveys at four locations prior to the start of construction activities to identify and catalog the types and numbers of bird species observed, their general behavior (foraging, resting, etc.), and their general locations in the proximity of the survey areas.. If sensitive species are nesting in proximity to construction sites, behavioral/disturbance monitoring will be conducted at nest sites.
- B. During construction, Biological Monitors will re-survey each of the four survey locations quarterly. The baseline data, survey locations and survey methodology are provided in a separate document: *Doyle Drive Replacement Project Avian and Noise Monitoring Baseline Surveys*.

- C. The Biological Monitor will prepare and provide memoranda to the Monitoring Lead after each monitoring event and document any dramatic changes during construction, such as birds avoiding the area or a cessation of foraging activity.
- D. If adverse impacts are noted, the Monitoring Lead and Caltrans Biologist will consult with biologists and Trust Review Group to determine ways to minimize impacts.

4.0 Vegetation Protection (non-wetland)

The Natural Environmental Study (NES) and the Final Environmental Impact Statement/Report (FEIS/R) for the Doyle Drive Project list two native vegetative communities that exist within the construction corridor that offer habitat to a variety of regionally important animal species; in addition, a soil type is listed that commonly host special status species.

The following vegetative communities or areas will require avoidance, mitigation, and monitoring to ensure that Project related impacts are minimized:

- central coast arroyo willow scrub;
- northern coastal scrub, all riparian areas;
- areas with serpentine soils.

4.1 Mitigation/Avoidance

Sensitive biological communities will be fenced-off by the Contractor as per Design Documents. Additional area(s) that warrant ESA status will be protected.

Avoidance of ESAs and general ESA requirements from the Caltrans Standard Specifications, detailed in each of the Doyle Drive Replacement Project contracts, will be strictly enforced.

4.2 ESA Avoidance and Monitoring

A Biological Monitor will be responsible for monitoring all established ESAs for the Doyle Drive Project.

1. On a weekly basis, the monitor will assess the integrity of the ESA fencing.
2. The Monitor will check the protected resources within the ESA for indications of disturbance resulting from construction activity.
3. If the ESA protects water resources, the Biological Monitor will be present during all critical construction periods, including: grubbing and clearing, culvert installation, and pouring concrete.
4. The Monitor will survey construction areas, service/haul roads, parking areas once a week to verify that contract specifications are adhered to. This information will be reported via memoranda and submitted to the Monitoring Lead, and if corrective actions are necessary, the Caltrans Biologist will communicate with the Resident Engineer.
5. The Monitor will also survey ESAs that are in close proximity to construction areas to determine whether sensitive plant species/ biological communities are being

impacted by dust. This information will be included in memoranda, and if significant impacts are determined, the Biological Monitor will discuss additional measures/frequency of abatement with the Monitoring Lead and the Caltrans Biologist.

5.0 Invasive Plant Species

During construction activities the Best Management Practices detailed in the construction specifications for each contract will be implemented by construction personnel and the Landscape Contractor to reduce the spread of exotic invasive plants throughout the project corridor.

5.1 Planting Limitations

1. Soil and plants removed and/or excavated will not be relocated to another Project site.
2. Sites disturbed before a planting effort will be treated immediately with a seed mixture and mulch using broadcast methods or hydroseed.
3. All terrestrial and aquatic revegetation efforts and materials, including seedling, mulch, and hydroseed, will be approved by the Trust Review Group.
4. Revegetation will occur as soon as is practicable after the completion of construction, and within the appropriate planting season (generally late fall/early winter), for areas that will not be subsequently disturbed.

5.2 Maintenance of Revegetation Sites

1. The Contractor will maintain mitigation sites.
2. Maintenance will include replacing plants, eradicating invasive species infestations, maintaining erosion control, materials and irrigation systems.
3. The Contractor is responsible for controlling the establishment of invasive plant species.

5.3 Monitoring and Implementing Maintenance

1. The Biological Monitor will prepare an action plan for control of invasive species and replanting efforts if remedial action is warranted.
2. The Biological Monitor will report planted site maintenance needs to the Monitoring Lead and the Caltrans Biologist (See Section 8.4). The Caltrans Biologist will consult with the Trust and Resident Engineer. The Resident Engineer will work with the Contractor to ensure implementation of the plan.

6.0 Special-Status Plant Species (non-wetland)

One special-status plants has been observed within the construction corridor; four special-status plant species have been found immediately adjacent to the Doyle Drive construction corridor; an additional 22 special status plant species are considered as candidates for potential occurrence within the corridor.

Species within the Project Study Area

Skunkweed, San Francisco owl's clover, San Francisco wallflower, San Francisco gumplant, and Franciscan thistle were all observed within close proximity of the Doyle Drive construction corridor; or in the case of skunkweed, within the construction corridor. San Francisco owl's clover was found immediately south of the construction corridor at Fort Scott.

- Franciscan thistle were found approximately 91 meters (300 feet) north of the construction corridor (and near Elderberry Island, south side) within the Project Study Area;
- San Francisco gumplant and San Francisco wallflower were also observed immediately north of the construction corridor below Lincoln Boulevard at the Park Presidio Interchange.
- Skunkweed has been observed bordering Battery Blaney Road, to the immediate north of Doyle Drive.

Additional Species

Of the 45 special-status plant species evaluated for the project, 26 species were determined to have some potential to exist within the construction corridor (although in many cases the probability is very low). The Biological Monitor will be a proficient botanist, able to identify the following species:

Species		Identification Period
California saltbrush	<i>Atriplex californica</i>	April – November
California seablite	<i>Suaeda californica</i>	July - October
San Francisco spineflower	<i>Chorizanthe cuspidata</i> var. <i>cuspidata</i>	April – July
San Francisco wallflower	<i>Erysimum franciscanum</i>	March – June
San Francisco gumplant	<i>Grindelia hirsutula</i> var. <i>maritima</i>	May – September
San Francisco campion	<i>Silene verecunda</i> ssp. <i>verecunda</i>	March – June
San Francisco lessingia	<i>Lessingia germanorum</i>	August – November
Skunkweed	<i>Navarretia squarrosa</i>	May - June
Marin dwarf flax	<i>Hesperolinon congestum</i>	May - June
Presidio Manzanita	<i>Arctostaphylos hookeri</i> ssp. <i>ravenii</i>	February – March
Presidio clarkia	<i>Clarkia franciscana</i>	May - June
Franciscan thistle	<i>Cirsium andrewsii</i>	June - July
Round-headed collinsia	<i>Collinsia corymbosa</i>	April - June
Point Reyes bird's-beak	<i>Cordylanthus maritimus</i> ssp. <i>palustris</i>	May - September
Dune gilia	<i>Gilia capitata</i> ssp. <i>chamissonis</i>	April - June
Pink sand-verbena	<i>Abronia umbellata</i> spp. <i>umbellata</i>	June - October
Coast rock cress	<i>Arabis blepharophylla</i>	February - May
Nuttall's milk-vetch	<i>Astragalus nuttallii</i> var. <i>virgatus</i>	January - November
Coast Indian paintbrush	<i>Castilleja affinis</i> ssp. <i>Affinis</i>	February - September
Salt marsh owl's clover	<i>Castilleja ambigua</i> ssp. <i>ambigua</i>	May - August
California goosefoot	<i>Chenopodium californicum</i>	January - November
Davy's clarkia*	<i>Clarkia davyi</i>	April - June
California croton	<i>Croton californicus</i>	June - September
Coast rein-orchid	<i>Piperia elegans</i>	May - September
Pacific cordgrass	<i>Spartina foliosa</i>	June - October
Dune tansy	<i>Tanacetum camphoratum</i>	June - September
California triquetrella moss	<i>Triquetrella californica</i>	NA
San Francisco owl clover	<i>Triphysaria floribunda</i>	

* Denotes species which are not native to the Presidio and therefore do not require mitigation should they be removed. Trust will be contacted if this species is discovered, as salvage may not be desired.

6.1 Mitigation/Avoidance

- A. Special status plant species will be fenced-off (ESA), if practicable, by the contractor under the supervision of the Biological Monitor.
- B. If ESA fencing is not practicable, the plant(s) will be relocated (preferably in late fall/early winter) to a site designated by the Trust Review Group.
- C. If transplants fail, special-status plant species will be replaced at a 1.5:1 ratio at a site(s) designated by the Trust Review Group.

6.2 Surveying and Monitoring

1. Pre-construction surveys will be conducted by a qualified botanist (Biological Monitor) for the presence of special-status plant species in May, June, and/or one week prior to the commencement of construction.
2. If special-status plant species are discovered within the construction corridor, the Biological Monitor will flag the individuals and will contact the Monitoring Lead and the Trust Review Group immediately to discuss the potential for salvage measures. Contractors will not destroy the plants until avoidance or salvage measures are in place.
3. The Monitoring Lead/Biological Monitor will submit written memoranda to the Caltrans Biologist within one calendar day of discovery. The Caltrans Biologist will contact the Resident Engineer immediately to discuss avoidance measures.
4. The Resident Engineer will determine whether ESA fencing is practicable; the Contractor will implement ESAs as needed.
5. Where circumstances prevent ESAs establishment within the construction corridor, the Caltrans Biologist and the Trust Review Group will be contacted by the Biological Monitor to discuss potential transplanting location(s) and timing.
6. Transplanted perennial special-status plants will be monitored by the Biological Monitor, three growing seasons after transplant. The monitor will assess whether the transplanted individuals are healthy and vigorous. Individuals that are not healthy and vigorous will be replaced in accordance with 5.2.7, below.
7. The Biological Monitor will prepare and submit a remediation plan (1.5:1 replacement) for impacted special-status plants (during construction or after transplant). The plan will be submitted to the Monitoring Lead for review before ultimate submittal to the Caltrans Biologist and the Trust Review Group for approval.

6.3 Reporting

1. The Biological Monitor will prepare and submit memoranda for each special-status plant survey, including transplanted individuals and protected individuals (ESAs).
2. The Biological Monitor will prepare and submit a remediation plan (1.5:1 replacement) regarding special-status plants (during construction or after transplant). The plan will be submitted to the Biological Construction Contractor for review before ultimate submittal to the Trust Review Group for approval.

7.0 Additional Sensitive Species

7.1 Tree Lupine Moth

This species is common throughout the Presidio, with potential habitat existing within the construction corridor. The species is typically found in association with its larval host plant, the yellow bush lupine, which exists in coastal scrub within the corridor. The species was also found in the Historic Forest in 1994.

7.1.1 Avoidance/Mitigation and Monitoring

When avoidance of the yellow bush lupine is infeasible, the species will be replaced at a 1.5:1 ratio. Planting locations will be determined in coordination with the Trust Review Group.

7.2 Bats

There are seven bat species that are federal or state species of special concern with some potential to inhabit sites within the Doyle Drive Construction Corridor: Pallid bat, greater western mastiff bat, long-eared myotis, fringed myotis, long-eared myotis, Yuma myotis, and Townsend's big-eared bat.

7.2.1 Surveys

A CDFG-approved Biological Monitor will conduct pre-construction surveys of all buildings that will be demolished, moved, or otherwise impacted as well as the appropriate elevated portions of the existing Doyle Drive alignment for the presence of breeding or roosting special-status bats. Portions of the Historic Forest that will be removed between May 1 and September 15 (breeding season) will also be surveyed for the presence of breeding or roosting special-status bats.

In the event that habitat is occupied by special-status bats, documented survey results (Section 6.2.2) will be submitted to the CDFG and the Trust Review Group, along with discussion for avoidance measures or relocation strategies. With agency approval, a qualified specialist holding the appropriate permit(s) will remove and relocate the bats or will set-up bat exclusion measures as deemed appropriate by CDFG.

If the bats cannot be relocated, the removal of the applicable structures will not occur between May 1 and September 15.

Protocol for relocation or monitoring of discovered bats will be addressed in consultation with CDFG.

7.2.2 Monitoring and Reporting

The Biological Monitor (specialist) will monitor special-status bats roosting/breeding sites weekly to determine: whether construction is impacting the species, whether ESAs have been satisfactorily implemented and are adhered to, and to determine the most appropriate time for relocating the individuals.

The Biological Monitor will prepare memoranda describing surveys, survey methodology, presence/absence of species, ESA recommendations and/or effectiveness, and life-cycle stages of the individuals found. Additionally, if individuals are to be relocated, the monitor

will prepare a protocol for such action (with agency input), which will be submitted to the Caltrans Biologist.

8.0 Revegetation

Within the construction corridor, all natural areas disturbed by project activities will be restored to the appropriate native vegetation type in natural areas, or the appropriate ornamental vegetation type in landscaped areas. This Plan specifies monitoring, reporting, and success criteria for native restoration only; ornamental areas will be subject to a separate agreement.

Areas of the Presidio to be restored will be restored per the Trust approved designs for the Doyle Drive Landscape/Hardscape, and fully established and maintained until the revegetated areas meet the defined success criteria (Section 8.3.5).

Revegetation efforts will conform to the 2001 Vegetation Management Plan and standard Trust and/or NPS restoration practices, including (or in addition to) the following measures:

1. Trust and/or NPS requirements developed and included in the construction specification for each contract
2. Seed will be collected (or plant material) from within the Presidio, under the direction of the Trust.
3. Seeds will be propagated and seedlings grown in the Presidio Nursery, unless the volume required exceeds the nurseries' capacity. For this circumstance, an alternative nursery will be selected by the Trust Advisory Group, to supplement raising planting stock.
4. Seed collection and propagation should occur at least 18 months prior to the year of planting.
5. Planting efforts will commence in the fall following the conclusion of construction for the given site.
6. Sites disturbed prior to planting will be treated immediately with a seed mixture and mulch or hydroseed composed of Trust Advisory Group approved species mix.
7. Erosion control and invasive species control measures will conform to the guidelines in Section 4.0 of this document, as modified by construction specifications developed for this project (language in contracts).
8. Native plants will be salvaged from affected areas prior to disturbance for maintenance, propagation, and replanting after construction or relocation during construction.
9. All revegetation plans will be reviewed by the Trust and will include the species list, site preparation needs, an erosion control plan, and a fencing plan as needed.

8.1 Maintenance (Contractor)

The Landscape Contractor will be responsible for implementing maintenance activities and administering remedial action when requested, for replanted areas. After the Caltrans

Biologist and the Trust approve proposed remedial actions, the contractor will be responsible for the following maintenance:

1. plant replacement;
2. upkeep of erosion control materials;
3. upkeep of irrigation systems;
4. weed control; and
5. trash and other debris removal.

8.2 Biological Monitor Responsibilities

1. The monitor will conduct qualitative surveys, twice annually for five years following planting (fall and spring), to assess: the general health of planted species, potential diseases effecting the plants, status/presence of invasive species, erosion control, and the irrigation system.
2. After the first growing season following planting, the monitor will survey planted sites using quantitative methods. The quantitative surveys will be conducted in the spring, every two years. Quantitative surveys will be conducted in the first spring following planting, following the third year, and following the fifth year post-planting. The quantitative survey will be used to assess whether the revegetation effort meets success criteria. Survey methods are described in the next section.

8.3 Vegetation Sampling Methods

All planted and revegetated areas will be periodically surveyed for a minimum of five years after planting, or until established success criteria are met. Surveys methods will be both qualitative and quantitative. The following is a discussion of both methods.

The monitoring methodology and success criteria apply only to native plant restoration, and do not include the designated historic forest or designed ornamental landscape revegetation efforts.

8.3.1 Qualitative Sampling

The Biological Monitor will conduct qualitative surveys twice annually following plantings. These surveys will assess the status of the site, including:

1. survival and vigor of planted vegetation by species;
2. presence/absence of native plant recruitment by species;
3. replanting efforts required;
4. presence and extent of non-native plant species, particularly invasive species;
5. erosion;
6. diseases affecting native vegetation;
7. status and effectiveness of the irrigation system;
8. trash/refuse/construction materials requiring removal; and
9. indications of problematic areas (bare ground), and analysis of potential causes and remediation.

Reports on the qualitative sampling will be used define maintenance tasks. Maintenance tasks may address:

- replanting requirements;
- irrigation upkeep or changes;
- problems with disease or erosion; and
- the need for more frequent cleanup.

8.3.2 Quantitative Sampling

The Biological Monitor will conduct the quantitative survey with multiple-hit, point-intersect sampling, in years 1, 3, and 5 following planting (at a minimum), between April 1 and June 30. This methodology is essentially the same as the Trust methodology for native restoration area sampling; should a more detailed write-up of this methodology be necessary, a full report explaining this methodology resides with the Trust.

Monitoring shall continue until success criteria are met.

8.3.3 Multiple Hit, Point Intercept Sampling

Sampling Design:

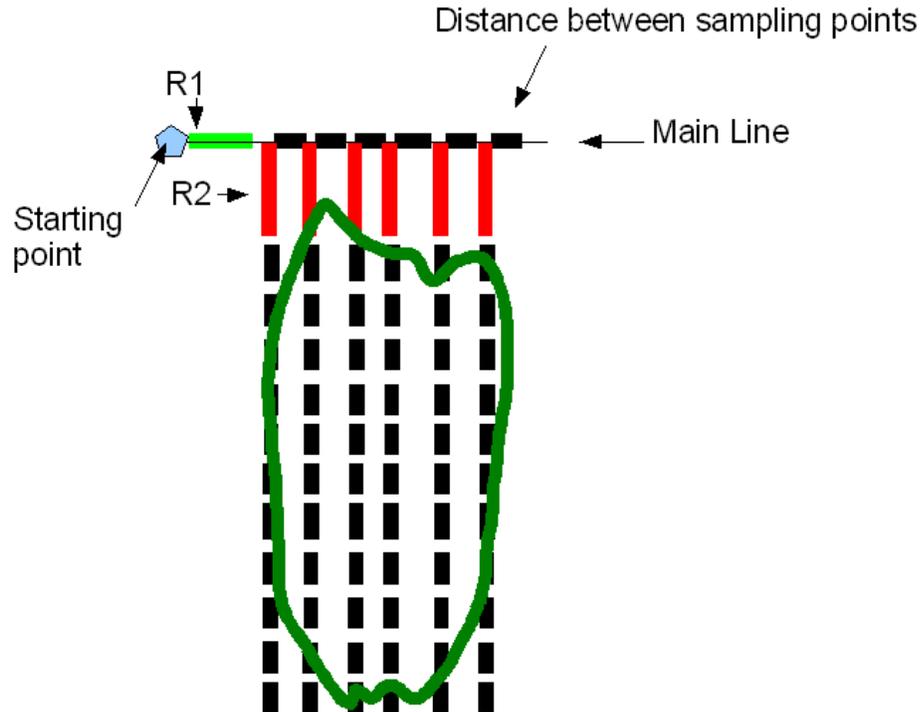
1. Sampling points will be established on a grid. A permanent "mainline" will be established that will allow for the greatest coverage of the site with sampling transects that will run perpendicular to the mainline. The two endpoints of the mainline will be marked in the field with rebar and protective caps and metal tags to identify the point. The endpoints will be photographed, with GPS waypoints taken to aid in future sampling efforts (See figure below).
2. Sampling transects will be established perpendicular to the mainline at a regular interval. The interval between transects will be the same within a given site, but will vary according to the area of the given restoration site.
3. The distance between transects and the distance between sampling points along each transect will be the same for an individual site.
4. This distance will be predetermined after the restoration area is calculated in square meters. The equation for distance between transects and sampling points is calculated by the following equation:

$$\text{Distance} = \text{Square Root of the Restoration Area (m}^2\text{)} / 10$$

5. Distance is then rounded down to the nearest whole unit in meters. This ensures that more than 100 sampling points are used and makes for more time-efficient sampling.
6. Two random numbers (each between 1 and 10) are selected with a random number generator in the office before sampling at the restoration site. These numbers will be used to randomize the systematic sampling scheme. The first random number (R1 in figure below) will dictate the distance of the first transect from an endpoint of the mainline; the second random number (R2 in figure below) will dictate the distance of the first sampling point from the mainline.

7. In successive years, these random numbers will be re-generated. The distance between sampling points is the same in successive years but the location of the grid would be shifted based on these two random numbers.
8. A tape measure will be used to mark off the pre-determined intervals along the mainline that transects will run off-of, perpendicular to the mainline.
9. A tape measure will be used for transects, that will be extended perpendicular to the mainline with a compass. The vegetation will be sampled along the transects at the predetermined distances (in whole meters).
10. A minimum of 100 points will sampled at equal intervals along the collective transects for each site.

Example of Sampling Scheme



Data Sampling:

1. For each sampling point, a rod is placed vertically against the ground running parallel to the person holding it.
2. At each sampling point, each plant that is touching the rod (hit) will be recorded, with the species name included.
3. If no plants intercept the rod, the sampling point will be recorded as bare ground (BG). However, if a large rock, large woody debris, or other obstruction exists at the

sampling location, the surveyor will record the obstruction (O). These points will be removed from analysis as they provide habitat and are not an indication of planting failure.

4. Height categories will be recorded for each hit (Low = 0.0 meter to 0.5 meter; Medium = 0.51 meter to 2 meters; High = >2 meters). Height categories are recorded for future incorporation into Trust databases and are not used in analyses for this project.
5. A single plant will be recorded as one hit, regardless of the number of times it touches the rod. Multiple height categories would be assigned to a single plant that touches the rod multiple times across more than one category. This plant would still be recorded as one hit (multiple height categories provided for separate Trust analyses).
6. If multiple individuals of one plant species are touching the rod at the sampling point, each will be recorded as a unique observation (hit).

8.3.4 Data Analysis

1. Following data collection, each species observed (with rod hits) will be labeled with codes indicating their native, non-native, non-native CallIPC table 1 list, or invasive status (i.e. native = N, exotic = E (non-native species not included in E1 and I categories), non-native CallIPC table 1 = EI, and invasive = I [see list provided in 8.3.5, #3]). Species will be summed by category for the analysis.
2. Percent cover will be calculated for each species and category. Percent cover is calculated in two ways:
 - Absolute percent cover is calculated by the number of sampling points at which a species (or category) occurred divided by the total number of sampling points in a site. Because more than one species can be observed at a single sampling point, the sum of absolute percent cover for all species in a site may be greater than 100 percent.
 - The relative cover of a species is the number of observations of a species relative to all plants observed at all sampling points at a site. The relative percent cover of a species is calculated by dividing the number of plants observed of a given species (or category) by the total number of plants observed at a site. This method means that relative percent cover is scaled such that the relative percent covers of all species found in a site sum to 100 percent.

8.3.5 Success Criteria

1. At the end of the monitoring period, at least 70 percent of the restoration area will be occupied by native species (absolute cover).
2. Less than twenty percent of the cover will be occupied by non-native invasive species, as defined by the CallIPC table 1 list, 2007 (relative cover).
3. Each revegetation area will have less than 10% cover of the following species at the conclusion of the monitoring period: Cape ivy (*Delairea odorata*); Mattress wire weed (*Muehlenbeckia complexa*); Himalayan blackberry (*Rubus discolor*); English ivy (*Hedera*

helix); African rice grass (*Ehrharta erecta*); iceplant (*Carpobrotus edulis*); radish (*Raphanus sativus*); and poison hemlock (*Conium maculatum*) (relative cover).

4. Following the five-year monitoring period a determination will be made, in consultation with Caltrans and the Trust Review Group as to whether the project achieved the listed success criteria, or whether additional maintenance/planting efforts are required. If additional maintenance/planting efforts are required, monitoring will continue until the project has achieved final mitigation goals.
5. Maintenance will continue for a minimum of five years and until all success criteria above are met.

8.4 Reporting

1. The Biological Monitor will prepare and submit to the Monitoring Lead, Caltrans Biologist, Presidio Trust and the Landscape Contractor, memoranda that details site specific maintenance requirements for replanted areas following all qualitative surveys. These reports, at a minimum, will detail:
 - replanting efforts required (and seed collection/propagation);
 - the general health of planted species;
 - potential diseases affecting the plants;
 - the status and maintenance needs of the irrigation system;
 - the effectiveness of erosion control measures;
 - the status of native species;
 - the status of non-native invasive species; and
 - native and non-native natural recruitment.
2. The Biological Monitor will prepare and submit monitoring reports for quantitative surveys, including the results of data analysis, within three months of the conclusion of the surveys. The report will be submitted to the Monitoring Lead and the Caltrans Biologist for review before its ultimate submittal to the Trust Review Group.
3. The Biological Monitor will prepare and submit a final Compliance Monitoring Report within three months of the conclusion of the fifth year of monitoring. The report will be submitted to the Monitoring Lead and the Caltrans Biologist for review before its ultimate submittal to the Trust Review Group and applicable agencies. If all success criteria have been met, the project shall be deemed completed. If additional maintenance and/or planting efforts are required, monitoring will continue until the project has achieved the final mitigation goals.