4. DESCRIPTION OF PROJECT ALTERNATIVES

Four alternatives and their environmental impacts are analyzed in this Final VMP and EA in conformance with the requirements of the National Environmental Policy Act (NEPA). NEPA requires federal agencies to conduct a careful, complete and analytic study of the impacts of proposals that have the potential to affect the environment, and consider alternatives to that proposal, well before any decisions are made. Federal agencies are also required to involve interested or affected members of the public in the NEPA process. The Final VMP and EA assists the NPS and the Trust in decision making and in the determinination that the potential for significant effect does not exist and the preparation of an environmental impact statement is not required. Three alternatives (the three "action" alternatives) are consistent with the approved GMPA, legal requirements, and established standards and guidelines for the management of natural and historic resources in accordance with the mission of the NPS. Following consideration of public and agency comment, Alternative 1 was designated by the NPS and the Trust as the Selected Alternative for VMP implementation.

Alternative 1: The Selected Alternative is composed collectively of the management actions in Section 3, Vegetation Management Plan. It is also the preferred alternative. This alternative is adopted by the NPS and Trust through a Finding of No Significant Impact (FONSI) for the VMP (included as Attachment E).

Alternative 2: No Action continues current management programs.

Alternative 3: Selective Forest Cuts provides an option for more quickly rehabilitating the historic forest.

Alternative 4: Increase Tree Diversity is another historic forest management option that further expands the variety of species that could be considered for replacement of historic species, beyond those considered under Alternative 1.

Actions within the native plant communities and landscape vegetation management zones would be the same in all but the No Action alternative.

A variety of other alternatives were suggested during scoping that would strongly shift the management balance of vegetation resources and the size of the area that they occupy. Alternatives that were considered, but rejected from further evaluation, are also presented with the reasons for their rejection.

4.1 ALTERNATIVE 1: PROPOSED ACTIONS

The proposed actions described in the Vegetation Management Plan are analyzed as Alternative 1. Please refer to Sections 3.2.2, 3.3.2, and 3.4.2. The proposed management actions are summarized below.

Native Plant Communities. Native plant communities would be restored where naturalized forest trees (outside of the historic forest management zone), non-native weedy species, non-historic development, and overgrown vegetation that obscures historic vistas are removed. Thirteen special-status species would be monitored and protected, and their habitat increased and enhanced. Community volunteer efforts would continue and would be expanded to implement additional restoration projects. Invasive weedy species and forest trees would be controlled and restricted to appropriate management zones.

Historic Forest. The historic forest would be rehabilitated within the historic forest management zone as fallen trees and storm events provide openings and opportunities for replacement. Over time, the historic forest management zone would be managed to incrementally increase age and speciesdiversity and to increase conditions that would encourage natural regeneration, with the species that were historically planted continuing to be present. Buffer areas using native trees and shrubs would be considered between native plant communities and historic forest to assist in containment of forest trees within the historic forest management zone. Key historic stands with high visibility would be managed to maintain historic species and configuration. Substitution of historically planted forest species would be considered in a few situations, such as to reduce tree height and to increase pest resistance if needed, following testing of potential replacement trees. Decisions for forest treatment would be made following site-specific evaluation by an interdisciplinary vegetation management team. Historic views and vistas would be maintained. Wood products and debris would be recycled and reused.

Landscape Vegetation. Replacement of horticultural plants within historic landscape areas would be based upon sustainability concerns, the species that were historically used, potential impacts to native species from cross-pollination, and invasive tendencies of some non-native plants. Hazardous trees would be identified, treated, and replaced. Identified erosion problems, as well as drainage and visitor use patterns that could initiate future erosion, would be corrected.

4.2 ALTERNATIVE 2: NO ACTION

Under the No Action alternative, those actions necessary to meet legislative requirements would be carried out. Current management programs would be continued. This alternative would not implement the many of the provisions adopted and approved in the GMPA, and would be restricted to those actions already being conducted. The No Action alternative is the baseline for describing impacts of the proposed actions and other alternatives.

Native Plant Communities. Existing native plant habitat and endangered species would be protected by averting direct threats. Additional habitat enhancement for special-status species would not be undertaken. Ongoing native plant restoration would continue at existing sites, but would not be expanded into new areas. Inventory and monitoring projects would continue at the current level as human resources and funding become available. Trees that have invaded native plant habitat would remain, and natural

regeneration and invasion by forest trees would expand into additional areas without containment efforts.

Historic Forest. The historic forest would be preserved and protected, but rehabilitation activities would not be initiated. When storm damage and old age resulted in tree loss, tree debris in more visible areas would be removed and the site would either remain barren or natural regeneration would take place to fill in areas of tree loss. No attempt to manage forest areas, control non-native understory, or encourage diversification or regeneration would be made. Unsightly topped trees along the southeast boundary would not be treated or replaced. Forest trees would continue to obscure scenic vistas.

Landscape Vegetation. Identified hazardous trees in developed areas and near structures would be removed to protect public health and safety and reduce liability. However, proactive pruning to reduce future hazards and prolong tree life would not be conducted. Trees in very visible areas along roadways and near development that die or that are removed because they are hazardous would be replaced by replanting. Other projects to inventory and rehabilitate landscape vegetation and implement sustainability practices would be considered as human resources become available and as specific or emergency needs arose. Existing erosion problems would continue and would not be corrected unless hazardous conditions developed.

4.3 ALTERNATIVE 3: SELECTIVE FOREST CUTS

Alternative 3 presents an additional treatment option for management of the historic forest management zone. All other actions for the two other vegetation zones (native plant communities and landscape vegetation) and for erosion control are the same as described for Alternative 1.

Historic Forest. Selective blocks of trees of a predetermined size would be removed to allow rehabilitation and replanting of the historic forest. Relatively small block cuts, less than 200 feet in diameter or from one-half to three-quarters of an acre, would be made. The cuts would be distributed throughout the historic forest so that adjacent blocks would have a minimum of a 10-year difference in their treatment dates. The cut block would be planted with the tree species that was historically planted in that area. By keeping the cut blocks relatively small, and staggering the treatment throughout the forest stand, small blocks of even-aged forest would be created, but the forest stand would consist overall of a mosaic of several age classes. The key historic forest stands that are highly visible would be intensively managed to preserve the historic character as in Alternative 1. Scenic vistas and historic views would be maintained as in Alternative 1. Replacement tree species to meet specific needs (such as pest resistance or height modification) would be considered after testing as in Alternative 1.

4.4 ALTERNATIVE 4: INCREASE TREE DIVERSITY

Alternative 4 presents another treatment option for management of the historic forest management zone. All other actions for the two other vegetation zones (native plant

communities and landscape vegetation) and for erosion control are the same as described for Alternative 1.

Historic Forest. Rehabilitation of the historic forest would proceed as in the proposed action, except many other tree species would be added for consideration as replacement trees in addition to the three historically planted tree species. This wide diversity of tree species would be considered as replacement species throughout the historic forest management zone. In contrast, Alternative 1 provides for consideration of other trees and shrubs (other than historically planted species) in specific instances - for buffer areas between historic and natural vegetation zones to assist in containment of forest trees, to reduce height of trees in some perimeter areas to allow continuation of neighboring views, and if required to provide pest resistance - but the three historically planted tree species would continue to characterize the forest composition..

While the three primary tree species appear to be well suited to the climate, soil, and conditions that exist in the Presidio, they have several inherent disadvantages related to potential pests and longevity. As described in previous sections, both Monterey pine and Monterey cypress are relatively short lived. Blue gum eucalyptus has undesirable attributes in old age as it becomes more brittle and drops branches, and can add to volatility during wildfires. Eucalyptus, Monterey pine, and Monterey cypress readily naturalize and expand into areas outside of the historic forest and require containment. Monterey pine and eucalyptus are susceptible to pests that have the potential, although not found as of this writing, to seriously damage existing forests. One species, coast redwood, that was historically planted, but that is not dominant would be considered for additional planting in the more sheltered areas. Many other tree species have been identified that might be suitable to supplement historically planted species. These species are of a variety of forms and heights; some are California natives, while others are from other places in the world. Table 2, Tree Species Potentially Suitable to Supplement Current Forest Species, lists these species.

Some of the trees listed in Table 2 (such as the cypress and eucalyptus species listed) have already been discussed in the proposed action as replacement species that would be considered in order to meet special needs (such as view protection by planting trees of a lower stature). These replacement species are not considered suitable for the key historic forests as identified in the proposed action that are highly visible and that would be intensively managed. Historically planted species would continue to be planted or allowed to regenerate in those key areas in order to maintain the historic character.

Table 2
Tree Species Potentially Suitable to Supplement Current Forest Species

Native Species*	
California buckeye	Aesculus californica
Madrone	Arbutus menziesii
Toyon	Heteromeles arbutifolia

California wax myrtle	Myrica californica
Coast live oak	Quercus agrifolia
Arroyo willow	Salix lasiolepis
Pacific black willow California Bay Big leaf Maple	Salix lucida ssp. Lasiandra Umbellularia californica Acer macrophyllum
Non-native Species	
Incense cedar	Calocedrus decurrens
Port Orford cedar	Chamaecyparis lawsoniana
Pygmy cypress	Cupressus pygmaea
Gowen cypress	Cupressus goveneano
Sargent cypress	Cupressus sargentii
Red-flowering gum	Eucalyptus ficifolia
Red-spotted gum	Eucalyptus mannifera maculosa
Willow-leafed peppermint gum	Eucalyptus nicholii
Silver dollar gum	Eucalyptus polyanthemos
Coral gum	Eucalyptus torquata
Tanbark oak	Lithocarpus densiflora
Catalina ironwood	Lyonothamnus floribundus
Coulter pine	Pinus coulteri
Shore pine	Pinus contorta
Afghan pine	Pinus eldarica
Bishop pine	Pinus muricata
Torrey pine	Pinus torreyana
Knobcone-Monterey pine	Pinus ´ attenuradiata
Holly leaf cherry	Prunus ilicifolia
Canyon oak	Quercus chrysolepis
Redwood	Sequoia sempervirens
California nutmeg	Torreya california
**Note: Obtained by regeneration of existing Presidio stock. Species native to California, but not native locally to the Presidio, are listed under non-native species.*	

4.5 ALTERNATIVES CONSIDERED BUT REJECTED

Three additional alternatives for management of the historic forest management zone were considered but were eliminated from further evaluation because they do not

maintain the historic forest character; would result in unacceptable resource, visitor use, or visual impacts; or are not compatible with the direction established in the GMPA.

4.5.1 Replace Tree Species in the Historic Forest Management Zone with Native Trees

In this alternative, the four dominant species that were historically planted would be replaced with native trees within the historic forest management zone. Over time blue gum eucalyptus, Monterey pine, Monterey cypress, and blackwood acacia would be eradicated because of the existing and potential problems discussed earlier (disease, pest, and fire potential; invasive spread into native plant communities; short life span; and view-blocking tree height). The historically planted species would be replaced with native trees, primarily coast live oak. Other native trees such as California wax myrtle, madrone, toyon, California buckeye, and willow would augment the oak plantings in suitable habitat areas.

This alternative was rejected from further consideration for several reasons. Replacement of the entire historic forest with native trees, with their smaller stature and distinctly different form and appearance (especially from coniferous Monterey pine and Monterey cypress) would totally alter the species composition, character, and appearance of the forest. This change in historic character would conflict with the direction established by the GMPA, would substantially alter a historical resource that contributes to the significance of the Presidio as a National Historic Landmark, and would require further compliance review and consultation as required by Section 106 of the National Historic Preservation Act. Replacement of historically planted trees with trees native to the Presidio would appear to enhance native plant protection, and would reduce aggressive tree naturalization and invasion of native plant habitat areas by eucalyptus and Monterey pine. However, this alternative would not be a native plant community restoration effort because live oak woodland did not occur in most of the historic forest management zone. Prior to European settlement, most of the areas now occupied by forest did not contain native trees, but were shrubland or grassland areas. In the sandy substrates and dune areas that underlie much of the forest zone, it may be difficult or impossible to establish native trees that are not adapted to that habitat.

4.5.2 Restore Open Space Areas (Outside of Landscape Vegetation Management Zone) with Native Plant Communities

Under this alternative, areas zoned as historic forest would be restored to the appropriate native plant community that was presumed to exist prior to settlement by Europeans. Historic landscape vegetation and planted trees would be maintained in conjunction with historic buildings, but the historic forest would be replaced with native plant communities: primarily dune scrub, coastal terrace prairie, and coastal scrub. This alternative would have the advantage of increasing the habitat area for native plants, and especially endangered species.

This alternative was rejected from additional consideration for several reasons: 1) it is not compatible with the management direction established in the GMPA, 2) it would result in the loss of the historic forest as a significant contributing resource to the Presidio National Historic Landmark District, 3) it would have a significant adverse impact on historic resources and the historic landscape, and 4) it would require further compliance review and consultation to conform with Section 106 of the National Historic Preservation Act.

4.5.3 Rehabilitate the Historic Forest Using Large Block Cuts

This alternative would increase the size of block cuts discussed in Alternative 3 and allow rehabilitation of the entire historic forest management zone with young trees over a 20- to 30-year period. Blocks of forest would be cut in a random pattern and trees replaced with the same species and at the same spacing and configuration as the original forest. The end result would be blocks of even-aged stands (2 to 5 acres in size), but the ages between adjacent blocks would vary. Tree species that were historically planted would continue to dominate. This method has the advantage of being a faster method of rehabilitating the forest and would allow efficient removal and utilization of timber products. Cut blocks would be periodically logged, cleared, and replanted with new trees at the historic spacing configurations with the historically planted species. This treatment would allow "key historic forest stands" as well as other historic forest stands, to be regenerated. It would maintain historic character and appearance by replacing older forests with new even-aged and evenly spaced trees. In areas where height modification is needed, trees would be planted, and then cut and replanted when their height exceeded a predetermined height that would block neighboring views.

This alternative for forest rehabilitation was rejected from further consideration because the scale of the logging operation it requires would greatly alter the setting, solitude, and features of the Presidio and the resulting forest stands would not be sustainable. Recreational activities, aesthetics, scenic values, and natural features would be disrupted. The cutting of live, healthy trees within the historic forest management zone, noise, and the level of activity associated with a logging operation would not be acceptable to most park visitors. Within the cut blocks, another even-aged stand would be created and the current problem of all of the trees maturing and reaching old age at one time would be perpetuated.

4.6 MITIGATION MEASURES FOR ENVIRONMENTAL PROTECTION INCORPORATED INTO THE SELECTED ALTERNATIVE

The table below lists the Mitigation Measures for Environmental Protection incorporated into the Selected Alternative. The measures in the table below replace fully the text listing of mitigation measures in the July VMP and EA (1999) on pages 74 - 75. Some of these new Mitigation Measures were developed by the NPS and the Trust in response to comments and questions raised by the public and agencies during the public review period. These additional measures either clarify VMP implementation procedures or further expand upon the original VMP EA mitigation measures. The added measures

strengthen the protection of park resources and the visitor experience during VMP implementation and reinforce the success of VMP projects by expanding on steps required during project planning. In the table below, the measures are grouped by issue area along with a description of the potential environmental effect.

Measures for Environmental Protection :

POTENTIAL IMPACT OR EFFECT :

Potential impact on the unique character of the historic forest due to the introduction of a more diverse suite of tree and understory species could jeopardize the NHL Status of the Presidio (Mitigated by CU-1 and CU-2)

MITIGATION MEASURES :

CU-1 *- A Historic Forest Characterization and Treatment Study (Historic Forest Study) shall be conducted by the National Park Service Olmsted Center for Landscape Preservation, or an affiliated group, to document, analyze and evaluate the characteristic features inherent in the historic forest and to develop a set of treatment recommendations consistent with the Secretary of the Interior's Standards for Treatment of Historic Properties with Guidelines for the Treatment of Cultural Landscapes. This study shall explore whether and to what extent alternate tree species could be introduced into the zones of the historic forest without adversely affecting the unique cultural landscape and character of the historic forest as guided by the National Historic Preservation Act.*

PHASE :

Phase I

RESPONSIBILITY FOR COMPLIANCE :

Presidio Trust VMP Project Manager / NPS VMP Program Manager

METHOD :

*Section 106 Proces*s

ENFORCEMENT :

Incorporate Historic Forest Study into VMP Implementation Strategy

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MITIGATION MEASURES :

CU-2 *- Future site-specific implementation plans and forestry management practices shall follow the recommendations of the Historic Forest Study to the extent necessary to*

ensure that the characteristics and qualities that define the Presidio historic forest are protected.

PHASE :
Phase II

RESPONSIBILITY FOR COMPLIANCE :
Presidio Trust VMP Project Manager / NPS VMP Program Manager

METHOD :
Section 106 Process

ENFORCEMENT :
Incorporate Recommendations into Implementation Plans

POTENTIAL IMPACT OR EFFECT :

The historic forest, including the key stands, has reached a mature stage and is in decline. Without active forest management, the decline will continue, and potentially impact the singular character of the forest. (Mitigated by CU-3 and CU-4)

MITIGATION MEASURES :
***CU-3** - The Historic Forest Study shall be prepared in a timely manner to allow for early identification of pilot projects and implementation strategies necessary to rehabilitate the historic forest's key stands. Forestry pilot projects, that both address the management of the historic forest's key stands and test these intensive tree care strategies shall be developed and implemented in a timely manner.*

PHASE :
Phase I

RESPONSIBILITY FOR COMPLIANCE :
Presidio Trust VMP Project Manager / NPS VMP Program Manager

METHOD :
Section 106 Process

ENFORCEMENT :
Incorporate Historic Forest Study Recommendations into Pilot Projects

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MITIGATION MEASURES :

CU-4 *- All historic forest preservation efforts shall occur under the direction of a qualified urban forester.*

PHASE :
Phases I, II & III

RESPONSIBILITY FOR COMPLIANCE :
Presidio Trust VMP Project Manager / NPS VMP Program Manager

METHOD :
Presidio Trust / NPS Grounds Maintenance Program

ENFORCEMENT :
Require as Part of VMP Implementation Strategy

POTENTIAL IMPACT OR EFFECT :

Rehabilitation and replacement of the landscape vegetation could result in a loss in the historic integrity of the cultural landscape (Mitigated by CU-5 and CU-6)

MITIGATION MEASURES :
CU-5 *- Prior to implementation of rehabilitation projects in the landscape vegetation zone, additional historic research (including site assessments and historic plant inventory), evaluation, and compatibility guidelines shall be prepared for specific sites to ensure compliance with the Secretary's Standards.*

PHASE :
Phase II

RESPONSIBILITY FOR COMPLIANCE :
Presidio Trust VMP Project Manager / NPS VMP Program Manager

METHOD :
Section 106

ENFORCEMENT :
Process Incorporate Guidelines into Rehabilitation Projects

MITIGATION MEASURES :
CU-6 *-The need to rehabilitate landscape vegetation shall be reduced by maximizing the use to the extent feasible and promoting the longevity of existing plant materials where they can meet program requirements. Use of existing plant material shall include*

salvaging and replanting existing vegetation, propagating Presidio plant stock from historic plant stock, and integrating core cultural landscape features (such as heritage trees) into site plans and designs. See also SUS-1.

PHASE :
Phases I & II

RESPONSIBILITY FOR COMPLIANCE :
Presidio Trust / NPS Historic Landscape Architect

METHOD :
Presidio Trust and NPS Leasing Program

ENFORCEMENT :
Require in Site Planning

POTENTIAL IMPACT OR EFFECT :

Disturbance and changes to the cultural landscape could affect contributing elements of the Presidio National Historic Landmark District. (Avoided by CU-7 and CU-8)

MITIGATION MEASURES :
***CU-7** - In accordance with the governing Programmatic Agreement under Section 106 of the NHPA, the following conditions shall apply to the implementation of the VMP.*

a. *All actions and projects that involve ground disturbance and changes to the cultural landscape implemented under the VMP shall be certified by historic preservation personnel through the applicable PA for conformance with the Secretary of the Interior's Standards for the Treatment of Historic Properties according to the requirements of the applicable PA for that action or project.*
b. *Action and projects that involve ground disturbance shall be subject to the provisions of the PA addressing archeological monitoring and the process followed if unexpected archeological resources are uncovered.*
c. *Consistent with the findings of the Historic Forest Study (see CR-1), any substitute species considered for planting in the historic forest (for example, other species of cypress or eucalyptus of lower stature) or in historic landscape areas shall be tested through pilot projects to assess the ability to survive site conditions and evaluated as to its physical appearance and characteristics.*

PHASE :
Phases I, II, & III

RESPONSIBILITY FOR COMPLIANCE :
Presidio Trust VMP Project Manager / NPS VMP Program Manager

METHOD :
Section 106 Process

ENFORCEMENT :
Require as part of VMP Implementation Strategy

MITIGATION MEASURES :
CU-8 *-Hazardous trees within the historic forest shall be documented under procedures outlined in the appropriate Landscape Preservation Maintenance Plan before removal. Sound forestry criteria for pruning all trees will be developed concurrently with planning for hazardous tree abatement.*

PHASE :
Phases I, II & III

RESPONSIBILITY FOR COMPLIANCE :
Presidio Trust Forester

METHOD :
Presidio Trust / NPS Grounds Maintenance Program

ENFORCEMENT :
Require as Part of VMP Implementation Strategy

POTENTIAL IMPACT OR EFFECT :

Conformance of Environmental Remediation Program with VMP treatments (Mitigated by ER-1)

MITIGATION MEASURES :
ER-1 *- Vegetation treatments that occur in conjunction with the Environmental Remediation Program for the Presidio shall conform to the VMP zoning map (Figure 3), and shall be subject to site-specific planning and environmental review prior to implementation.*

PHASE :
During Environmental Remediation Program

RESPONSIBILITY FOR COMPLIANCE :
Presidio Trust Environmental Remediation Program Manager / NPS Environmental Remediation Personnel

METHOD :
Presidio Trust Remediation Program

ENFORCEMENT :
Incorporate into Presidio Trust Environmental Remediation Program

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POTENTIAL IMPACT OR EFFECT :

Potential erosion due to surface disturbance and change to existing ground cover (Mitigated by SO-1)

MITIGATION MEASURES :

SO-1 *- Projects that disturb soil and groundcover vegetation shall minimize soil erosion by complying with the following best management practices (BMPs):*

- *Stumps shall be left and cut at ground level in erosive soils, and erosion control measures shall be taken to reduce compaction, reduce the size of area disturbed, and stabilize soils with approved erosion control techniques including blankets, netting, wattles and straw when needed.*
- *Unless there are no feasible alternatives, the use of heavy equipment shall be avoided in areas where soils are wet and in areas where compaction could occur that would cause significant soil damage.*
- *Disturbed soils shall be returned to a stable condition by ensuring installation of appropriate erosion control measures and by replanting in the native plant community and historic forest areas consistent with the VMP zones.*
- *Site grading and drainage plans shall include drainage design measures that promote groundwater percolation through soil decompaction and use of permeable ground cover.*

PHASE :
Phases I, II & III

RESPONSIBILITY FOR COMPLIANCE :
Presidio Trust VMP Project Manager / NPS VMP Program Manager

METHOD :
Presidio Trust / NPS Grounds Maintenance Program

ENFORCEMENT :
Incorporate BMPs into Implementation Plans

POTENTIAL IMPACT OR EFFECT :

The mature forest is in decline and needs active management to enhance forest health (Mitigated by FM-1 and FM-2)

MITIGATION MEASURES :

FM-1 *- The effectiveness of the forest rehabilitation efforts shall be monitored annually, and evaluated every 5 years to consider: changes in the number and size of windthrow areas; progress in moving toward more uneven-aged stands; experience gained from active management of the Presidio forest as well as experiences of other land managers of similar forests; and past and estimated future costs of forest maintenance. The findings shall be used to determine whether changes to forestry strategies, treatments and management will be required.*

PHASE :

Phases II & III

RESPONSIBILITY FOR COMPLIANCE :

Presidio Trust VMP Project Manager / NPS VMP Program Manager

METHOD :

Presidio Trust / NPS Grounds Maintenance Program

ENFORCEMENT :

Incorporate Findings into Annual Forestry Workplan

MITIGATION MEASURES :

FM-2 *- Monitoring of historic forest conditions shall be undertaken to collect data such as soil types, site conditions and seed release and dispersal factors, in order to increase the potential for voluntary reseeding of tree species. See also CR-1 - CR-4.*

PHASE :

Phase II

RESPONSIBILITY FOR COMPLIANCE :

Presidio Trust Forester

METHOD :

Presidio Trust / NPS Grounds Maintenance Program

ENFORCEMENT :

Incorporate Findings into Annual Forestry Workplan

POTENTIAL IMPACT OR EFFECT :

Potential impacts on forest health due to infection from pests and diseases (Mitigated by FM-3)

MITIGATION MEASURES :

FM-3 *- Periodic monitoring and seasonal inspection of selected forest stands shall be conducted to detect disease and pest problems at an early stage. An integrated pest management plan shall be developed if monitoring indicates the presence of the pine pitch canker (a fungus), the eucalyptus longhorn borer, or other known pests and diseases in the Presidio.*

PHASE :

When Required

RESPONSIBILITY FOR COMPLIANCE :

Presidio Trust Forester and Presidio Trust / NPS Integrated Pest Management Specialists

METHOD :

Presidio Trust / NPS Grounds Maintenance Program

ENFORCEMENT :

Incorporate Monitoring into Annual Forestry Workplan

POTENTIAL IMPACT OR EFFECT :

Potential impact of increased wild fire hazard as the result of high fire fuel loads (Mitigated by FM-4)

MITIGATION MEASURES :

FM-4 *- Forest fuel loads shall be frequently inspected, and shall be altered when necessary by removing dead and fallen trees and branches, pruning trees to remove dead branches that can act as a fuel ladder, and removing excessive forest litter. Clearing or mowing of understory vegetation shall occur in areas that are frequently visited when necessary to reduce fire hazard.*

PHASE :

All Phases

RESPONSIBILITY FOR COMPLIANCE :

Presidio Trust Forester and NPS Fire Management Personnel.

METHOD :

Presidio Trust / NPS Grounds Maintenance Program

ENFORCEMENT :
Incorporate Monitoring into Annual Forestry Workplan

POTENTIAL IMPACT OR EFFECT :

Potential impacts of changed viewshed and wind patterns due to VMP projects within historic forest and native plant communities (Mitigated by LU-1 --LU-3)

MITIGATION MEASURES :
***LU-1** - Public involvement and plan review shall be incorporated into site-specific planning for projects adjacent to residential boundaries. Modifications to projects in response to concerns raised by adjacent communities shall be considered as part of the project planning and design.*

PHASE :
Phase II

RESPONSIBILITY FOR COMPLIANCE :
Presidio Trust VMP Project Manager / NPS VMP Program Manager

METHOD :
Presidio Trust and NPS NEPA Compliance Processes

ENFORCEMENT :
Incorporate Public Involvement into Project Planning and Design

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MITIGATION MEASURES :
***LU-2** - The size and configuration of forest openings shall depend largely on the effects of storms, but when storm-damaged trees are cleared to prepare a site for rehabilitation, the effect of wind on regeneration success and windbreak functions shall be considered. Clearings will generally be oriented perpendicular to the prevailing wind in a southwest-northeast pattern. See also NO-2, NO-3, PP-1, and VR-1 - VR-5.*

PHASE :
Phase II

RESPONSIBILITY FOR COMPLIANCE :
Presidio Trust Forester

METHOD :
Presidio Trust / NPS Grounds Maintenance Program

ENFORCEMENT :
Require as Part of VMP Implementation Strategy

MITIGATION MEASURES :
***LU-3** -- Where practicable, conduct an analysis of the potential changes to both the local wind patterns and forest windbreak integrity that could occur as the result of tree removal activities prior to project implementation. Incorporate findings into project design.*

PHASE :
Phases I & II

RESPONSIBILITY FOR COMPLIANCE :
Presidio Trust Forester and VMP Project Manager/ NPS VMP Program Manager

METHOD :
Presidio Trust and NPS Compliance Processes

ENFORCEMENT :
Require as Part of VMP Implementation Strategy

POTENTIAL IMPACT OR EFFECT :
Potential impacts on native plant communities due to the spread of invasive exotic plant species (Mitigated by NP-1)

MITIGATION MEASURES :
***NP-1** - The following strategies shall be employed to control the spread of invasive exotic plants in the Presidio:*

- *A list of approved plant material for horticultural use shall be developed, and periodically revised, in planting plans.*
- *Integrated pest management practices shall be used to control and/or remove targeted invasive exotic species threatening sensitive native habitat.*
- *Tests shall be conducted to evaluate the most ecological and cost effective methods for controlling and/or removing targeted invasive exotic species.*

PHASE :
All Phases

RESPONSIBILITY FOR COMPLIANCE :
Presidio Trust VMP Project Manager and Forester / NPS VMP Program Manager

METHOD :
Presidio Park Stewardship Program

ENFORCEMENT :
Incorporate Strategies into Implementation Plans

POTENTIAL IMPACT OR EFFECT :

Potential impacts on native plant communities, due to VMP-related activities, which could accelerate erosion, change surface hydrology or remove vegetation (Mitigated by NP-2 - NP-6)

MITIGATION MEASURES :
***NP-2** - Systematic monitoring shall occur to evaluate the success of the native plant community restoration projects. Monitoring results shall be used to document population and species composition changes and provide a baseline for measuring the effectiveness of enhancement and restoration efforts as they are implemented. If negative trends occur, the project would be carefully reviewed and further actions would cease. The project would be revised to determine the necessary corrective action. Annual monitoring activities shall include:*

- *Photo documentation of the pre-project condition, restoration activities and annual photo points.*
- *Continuation of regular qualitative evaluation of most existing native plant communities.*
- *Establishment of permanent quantitative transects in reference areas and restored habitat.*
- *Establishment and/or modification of protocols necessary for assessing the development of re-created native plant communities.*
- *Annual censusing and/or range mapping of all thirteen special-status plant species and any other special-status species that may occur in the future.*

PHASE :
Phases II & III

RESPONSIBILITY FOR COMPLIANCE :
Presidio Trust Natural Resources Program Manager and NPS VMP Program Manager

METHOD :
Presidio Park Stewardship Program

ENFORCEMENT :
Incorporate Monitoring into Implementation Plans

MITIGATION MEASURES :
***NP-3** - Native plant material shall be salvaged to the greatest extent feasible, as directed by a qualified restoration specialist, prior to tree removal activities within both the native plant communities and historic forest zones.*

PHASE :
All Phases

RESPONSIBILITY FOR COMPLIANCE :
Presidio Trust Natural Resources Program Manager and NPS VMP Program Manager

METHOD :
Presidio Park Stewardship Program and Presidio Trust / NPS Grounds Maintenance Program

ENFORCEMENT :
Require as Part of VMP Implementation Strategy

MITIGATION MEASURES :
***NP-4** - Heavy equipment use shall be scheduled, to the greatest extent feasible, to avoid areas where soils are wet and prone to compaction.*

PHASE :
All Phases

RESPONSIBILITY FOR COMPLIANCE :
Presidio Trust VMP Project Manager and Forester / NPS VMP Program Manager

METHOD :
Presidio Park Stewardship Program and Presidio Trust / NPS Grounds Maintenance Program

ENFORCEMENT :
Incorporate Condition into Implementation Plans

MITIGATION MEASURES :
***NP-5** - Existing vegetation shall be fenced, if deemed appropriate by a qualified*

restoration specialist, to prevent accidental incursions during VMP project implementation. An education strategy for work crews shall be conducted on site, to include training in plant and sensitive resource identification.

PHASE :
Phase II

RESPONSIBILITY FOR COMPLIANCE :
Presidio Trust VMP Project Manager and Forester / NPS VMP Program Manager

METHOD :
Presidio Park Stewardship Program

ENFORCEMENT :
Incorporate Condition into Implementation Plans

MITIGATION MEASURES :
***NP-6** - All native plants shall be grown from existing Presidio genetic stock propagated at the Presidio-based nursery or in accordance with established practices within the Nursery System Standard Operating Procedures. If no on-site seeds or cuttings are available, documentation of the justification for the reintroduction decision shall be prepared, and an evaluation shall be conducted to determine the most appropriate off-site source for reintroduction. Temporary fencing, to prevent visitors on the trail and overlooks from disturbing existing and newly planted habitat areas after construction, shall be installed where necessary.*

PHASE :
Phase II

RESPONSIBILITY FOR COMPLIANCE :
Presidio Trust Natural Resources Program Manager and NPS VMP Program Manager

METHOD :
Presidio Park Stewardship Program

ENFORCEMENT :
Incorporate Condition into Implementation Plans

POTENTIAL IMPACT OR EFFECT :

Potential impacts on native plant communities due to the spread of the historic forest beyond the historical boundaries (Mitigated by NP-7 and NP-8)

MITIGATION MEASURES :
NP-7 *- Temporary fencing shall be installed to protect native plant communities, as necessary, when removing stands of invasive trees outside of the historic forest, or as needed for forest diversification. Disturbance will be limited to areas prescribed by the fencing.*

PHASE :
Phase II

RESPONSIBILITY FOR COMPLIANCE :
Presidio Trust Natural Resources Program Manager and Forester / NPS VMP Program Manager

METHOD :
Presidio Park Stewardship Program

ENFORCEMENT :
Incorporate Condition into Implementation Plans

MITIGATION MEASURES :
NP-8 *- To reduce the workload needed to contain the spread of forest species and increase the diversity of forest species, transition and buffer areas shall be established where historic forest plantings abut native plant communities. Buffers shall not be established on the perimeters of key historic forest stands to avoid altering their historic character. Site-specific planting plans for buffer areas shall be guided by both the Historic Forest Study and ecological restoration action plans.*

PHASE :
Phase II

RESPONSIBILITY FOR COMPLIANCE :
Presidio Trust VMP Project Manager and Forester / NPS VMP Program Manager

METHOD :
Presidio Park Stewardship Program

ENFORCEMENT :
Incorporate Condition into Implementation Plans

POTENTIAL IMPACT OR EFFECT :
Ensure protection of rare and endangered species (Mitigated by NP-9 - 11)

MITIGATION MEASURES :
NP-9 *- The southwest corner of the Presidio in Area A is designated as a Special Management Zone (SMZ) for future planning pending the forthcoming U.S. Fish and Wildlife Service (USFWS) Recovery Plan for Coastal Plants of the Northern San Francisco Peninsula. The USFWS Recovery Plan will recommend areas of the Presidio, including the SMZ, that could provide habitat critical for the long-term recovery of the San Francisco lessingia, a federally-listed endangered species. During NEPA review of the VMP, public comment indicated a range of issues for consideration in future planning of the SMZ. These issues include effects on viewshed, wind patterns, noise, native plant restoration, historic forest, rare plant species and wildlife habitat. SMZ planning will proceed when the USFWS Recovery Plan is finalized. At that time, an interdisciplinary group, comprised of resource experts and interested public, will work in a collaborative setting to develop the vegetation zoning and treatment of the SMZ.*

PHASE :
Upon Completion of the USFWS Recovery Plan for Coastal Plants of the Northern San Francisco Peninsula

RESPONSIBILITY FOR COMPLIANCE :
Presidio Trust VMP Project Manager, Natural Resources Program Manager and Forester / NPS VMP Program Manager and Natural Resource Specialist

METHOD :
USFWS Section 7 Consultation Process

ENFORCEMENT :
Incorporate Critical Habitat into Implementation Plan for SMZ

MITIGATION MEASURES :
NP-10 *- Monitoring of all known special-status species populations shall be conducted annually until the natural variation in population size is well documented; after that, monitoring shall be conducted at least once every 3 years. If declining trends are observed, then consultation with USFWS to develop corrective management actions shall occur.*

PHASE :
Phases I, II & III

RESPONSIBILITY FOR COMPLIANCE :
Presidio Trust Natural Resources Program Manager / NPS Natural Resource Specialist

METHOD :
USFWS Section 7 Consultation Process

ENFORCEMENT :
Incorporate Monitoring and Management Actions into Annual Workplan

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MITIGATION MEASURES :
NP-11 *- The Section 7 consultation process shall be followed for all management actions for federally-listed species.*

PHASE :
Phases I, II & III

RESPONSIBILITY FOR COMPLIANCE :
Presidio Trust Natural Resources Program Manager / NPS Natural Resources Division Chief and Natural Resource Specialist

METHOD :
USFWS Section 7 Consultation Process

ENFORCEMENT :
Require as Part of VMP Implementation Strategy

POTENTIAL IMPACT OR EFFECT :

Potential impact to visitors and residents due to noise generated from power equipment associated with VMP projects (Mitigated by NO-1)

MITIGATION MEASURES :
NO-1 *- Work areas will be temporarily closed to the public when loud machinery is in operation to avoid exposing visitors to high noise levels. Tasks that generate high noise levels, such as wood chipping, will be conducted at less intrusive areas or moved offsite whenever feasible. Activities that generate high noise levels will be limited to daylight and weekday hours and will be scheduled to minimize noise impacts for visitors and residents.*

PHASE :
During Demolition and Construction

RESPONSIBILITY FOR COMPLIANCE :
Presidio Trust VMP Project Manager and Forester / NPS VMP Program Manager

METHOD :
Presidio Park Stewardship Program and Presidio Trust / NPS Grounds Maintenance Program

ENFORCEMENT :
Incorporate Noise Provisions into Implementation Plans

POTENTIAL IMPACT OR EFFECT :
Ensure effectiveness of Pilot Project Programs (Mitigated by PP-1)

MITIGATION MEASURES :
***PP-1** - Site-specific pilot programs shall be developed and implemented over the next 5-8 years to test and assess the effectiveness of restoration and forestry techniques, and monitor results and performance. Results of the pilot projects shall be used to inform future VMP implementation actions. Pilot projects shall conform to the following:*

- *Pilot programs shall be small in scale, varied in location (but generally in less visible areas), and representative of a variety of options for historic forest treatment and native plant community restoration.*
- *Plans for site-specific programs shall be developed through careful site evaluation and biological assessment by an interdisciplinary team.*
- *Site-specific restoration projects shall be subject to NEPA review prior to implementation.*
- *A monitoring analysis, post-construction evaluation and documentation program shall be conducted for each pilot project thereby providing analysis and information to guide the implementation of future projects.*

PHASE :
Phase I

RESPONSIBILITY FOR COMPLIANCE :
Presidio Trust VMP Project Manager and Forester / NPS VMP Program Manager

METHOD :
Presidio Trust and NPS NEPA Compliance Processes

ENFORCEMENT :
Incorporate Conditions into Pilot Projects

POTENTIAL IMPACT OR EFFECT :
Potential impacts to volunteer programs and interpretive opportunities as the result of VMP implementation activities (Mitigated by RV-1 - RV-3)

MITIGATION MEASURES :
RV-1 *- Education, interpretation and public relations programs would be developed and publicized to convey the reasons for the VMP projects.*

PHASE :
Phase II

RESPONSIBILITY FOR COMPLIANCE :
Presidio Trust VMP Project Manager and Forester / NPS VMP Program Manager

METHOD :
Presidio Trust / NPS Public Education, Interpretation and Public Relations Programs

ENFORCEMENT :
Require as Part of VMP Implementation Strategy

MITIGATION MEASURES :
RV-2 *- The Presidio Park Stewardship Program and future stewardship programs shall be continued collaboratively between the NPS and Presidio Trust to provide interpretive experiences and volunteer opportunities for the community.*

PHASE :
Phases I, II & III

RESPONSIBILITY FOR COMPLIANCE :
Presidio Trust Natural Resources Program Manager / NPS Natural Resource Specialist

METHOD :
Presidio Trust Parkwide Improvements Program

ENFORCEMENT :
Require as Part of VMP Implementation Strategy

MITIGATION MEASURES :
RV-3 *- The Presidio Trails and Bikeways Master Plan shall conform to guidance of the VMP.*

PHASE :
Construction of Presidio Trails and Bikeways Plan

RESPONSIBILITY FOR COMPLIANCE :
NPS VMP Program Manager

METHOD :
NPS NEPA Compliance Process

ENFORCEMENT :
Incorporate into Presidio Trails and Bikeways Plan

POTENTIAL IMPACT OR EFFECT :
Potential hazards presented to visitors through tree fall or limb breakage (Mitigated by SA-1)

MITIGATION MEASURES :
***SA-1** - Hazardous trees that pose direct and unavoidable threats to human health and safety shall be removed following consideration of measures WI 1-3. Hazardous tree reports shall be reviewed annually to determine the need for replacement plantings. The ratio used for replacement plantings shall depend on site-specific conditions such as the level of natural regeneration in the area, effects on visitor experience, and screening requirements.*

PHASE :
Phases I, II & III

RESPONSIBILITY FOR COMPLIANCE :
Presidio Trust Forester

METHOD :
Presidio Trust / NPS Grounds Maintenance Program

ENFORCEMENT :
Incorporate into Annual Forestry Workplan

POTENTIAL IMPACT OR EFFECT :
Potential for hazards to visitors from VMP implementation activities (Mitigated by SA-2)

MITIGATION MEASURES :
***SA-2** -Implementation activities could pose hazards to the public if uncontrolled access is permitted in VMP project areas during implementation. During implementation, the project area, including the portions of any adjacent trail systems and recreational resources, shall be fenced and closed to the public.*

PHASE :
Phase II

RESPONSIBILITY FOR COMPLIANCE :
Presidio Trust Forester

METHOD :
Presidio Trust / NPS Grounds Maintenance Program

ENFORCEMENT :
Incorporate Condition into Implementation Plans

POTENTIAL IMPACT OR EFFECT :

Potential interim impacts to visitor experience, due to changed visual effects and landscape features during tree removal and vegetation clearing activities (Mitigated by VS-1 - VS-5)

MITIGATION MEASURES :
VS-1 *- Reforestation of forestry project areas shall occur as soon after clearing of the dead and down trees as possible (when feasible, within one year). Temporary irrigation shall be installed to ensure the survivorship of saplings.*

PHASE :
Phase II

RESPONSIBILITY FOR COMPLIANCE :
Presidio Trust Forester

METHOD :
Presidio Trust / NPS Grounds Maintenance Program

ENFORCEMENT :
Incorporate Condition into Implementation Plans

MITIGATION MEASURES :
VS-2 *- Revegetation of restoration project areas with native plants shall be completed as expeditiously as resources permit. If revegetation takes more than one year, an exotic species control strategy shall be implemented to prevent the establishment of invasive exotic weeds.*

PHASE :
Phase II

RESPONSIBILITY FOR COMPLIANCE :
Presidio Trust Natural Resources Program Manager / NPS VMP Program Manager

METHOD :
Presidio Park Stewardship Program

ENFORCEMENT :
Incorporate Condition into Implementation Plans

MITIGATION MEASURES :
***VS-3** - Forestry rehabilitation areas that require tree removal within the historic forest shall be restricted to a size of less than ½-acre to minimize visual impacts, unless otherwise approved.*

PHASE :
Phase II

RESPONSIBILITY FOR COMPLIANCE :
Presidio Trust Forester

METHOD :
Presidio Trust / NPS Grounds Maintenance Program

ENFORCEMENT :
Incorporate Condition into Implementation Plans

MITIGATION MEASURES :
***VS-4** - Photographic simulations shall be developed for a repertoire of typical vegetation management projects to serve as examples of proposed forest rehabilitation and native plant restoration treatments.*

PHASE :
Phases I & II

RESPONSIBILITY FOR COMPLIANCE :
Presidio Trust VMP Project Manager and Forester / NPS VMP Program Manager

METHOD :
Presidio Park Stewardship Program

ENFORCEMENT :
Incorporate Simulations into Implementation Plans

MITIGATION MEASURES :
VS-5 *- The selection of projects for annual workplans shall take into account the cumulative effect of individual projects on the overall scenic resources and visitor experience of the park. Steps shall be taken to disperse the implementation activities throughout the park whenever possible, so as not to overwhelm any one area with dramatic changes. See also SO-1(a), SA-1 and NR-10.*

PHASE :
Phase II

RESPONSIBILITY FOR COMPLIANCE :
Presidio Trust VMP Project Manager and Forester / NPS VMP Program Manager

METHOD :
Presidio Park Stewardship Program

ENFORCEMENT :
Incorporate into Annual Workplan

POTENTIAL IMPACT OR EFFECT :
Implementation of the VMP could result in an increased demand for scarce resources and generate increased solid waste (SU-1 - SU-3).

MITIGATION MEASURES :
SU-1 *- The selection of landscape plants shall consider sustainability criteria including disease and pest resistance, drought tolerance, suitability to the site's microclimate, and the degree of care required to reduce demands for energy and intensive ongoing maintenance.*

PHASE :
Phase II

RESPONSIBILITY FOR COMPLIANCE :
Presidio Trust / NPS Landscape Architects

METHOD :
Presidio Trust and NPS Leasing Program

ENFORCEMENT :
Require in Site Planning

MITIGATION MEASURES :
SU-2 *- Water conservation measures shall be factored into the planning, design and on-going maintenance of landscaped areas, including the establishment period for reforestation areas and native plant restoration sites.*

PHASE :
Phase II

RESPONSIBILITY FOR COMPLIANCE :
Presidio Trust / NPS Landscape Architects

METHOD :
Presidio Park Stewardship Program and Presidio Trust / NPS Grounds Maintenance and Leasing Programs

ENFORCEMENT :
Incorporate Measures into Implementation Plans

MITIGATION MEASURES :
SU-3 *- Sustainable green waste and composting facilities shall be increased and/or developed to ensure that organic debris is recycled and reused as much as possible within the Presidio.*

PHASE :
Ongoing

RESPONSIBILITY FOR COMPLIANCE :
Presidio Trust Sustainability Coordinator

METHOD :
Presidio Trust Sustainability Program

ENFORCEMENT :
Incorporate into Presidio Trust Sustainability Program

POTENTIAL IMPACT OR EFFECT :

Potential impacts to wildlife habitat due to VMP project activities (Mitigated by WI-1 - WI-5)

MITIGATION MEASURES :
WI-1 *- With the exception of unanticipated events requiring hazardous tree abatement, vegetation removal activities or activities using loud power or mechanical equipment will*

be scheduled outside of the annual bird-breeding season - currently March 1st to August 15th).

PHASE :
Phase II

RESPONSIBILITY FOR COMPLIANCE :
Presidio Trust Forester and Natural Resource Program Manager / NPS Wildlife Biologist

METHOD :
Presidio Park Stewardship Program and Presidio Trust / NPS Grounds Maintenance and Leasing Programs

ENFORCEMENT :
Incorporate Measures into Implementation Plans

MITIGATION MEASURES :
***WI-2** - To reduce effects on wildlife and wildlife habitat, work areas will be delineated with habitat fencing, where necessary, and work crews shall be trained to minimize effects to habitat values.*

PHASE :
Phase II

RESPONSIBILITY FOR COMPLIANCE :
Presidio Trust Forester and Natural Resource Program Manager / NPS Wildlife Biologist

METHOD :
Presidio Park Stewardship Program and Presidio Trust / NPS Grounds Maintenance and Leasing Programs

ENFORCEMENT :
Incorporate Measures into Implementation Plans

MITIGATION MEASURES :
***WI-3** - Any removal of vegetation shall follow adopted guidelines for protection of nesting birds. These guidelines include restrictions on timing of vegetation removal and requirements for searching for nests prior to removal if activities can not be delayed. Unanticipated events requiring hazard tree abatement shall be conducted when necessary outside of the restrictive timelines, and conform to measures SA-1 and SA-2.*

Restriction of work areas and education of work crews may also be used to reduce possible wildlife impacts.

PHASE :
Phase II

RESPONSIBILITY FOR COMPLIANCE :
Presidio Trust Forester and Natural Resource Program Manager / NPS Wildlife Biologist

METHOD :
Presidio Park Stewardship Program and Presidio Trust / NPS Grounds Maintenance and Leasing Programs

ENFORCEMENT :
Incorporate Measures into Implementation Plans

MITIGATION MEASURES :
***WI-4** - Prior to tree removal, each work site shall be evaluated by a qualified biologist to determine whether any element of the forest or the proposed restoration site provides habitat for any special-status species. Measures shall be developed for avoiding any elements identified. If avoidance is infeasible, consultation would be completed consistent with Measure NP-11. Nonnative forest stands with high wildlife values shall generally be retained, unless they will be replaced incrementally with rare native plant communities, such as serpentine communities, or native plant communities that also have high wildlife value, such as coast live oak or willow riparian plant communities or forest stands with greater wildlife value consistent with the HFCTS treatments.*

PHASE :
Phase II

RESPONSIBILITY FOR COMPLIANCE :
Presidio Trust Forester and Natural Resource Program Manager / NPS Wildlife Biologist

METHOD :
Presidio Park Stewardship Program and Presidio Trust / NPS Grounds Maintenance and Leasing Programs

ENFORCEMENT :
Incorporate Measures into Implementation Plans

MITIGATION MEASURES :
WI-5 *- Areas within the forest management zone shall be evaluated to determine where standing dead or downed limbs and trees will be allowed to decompose naturally to enhance wildlife habitat providing they neither harbor pests or diseases that can affect other Presidio resources, nor create a fire hazard, nor conflict with the Historic Forest Study treatments.*

PHASE :
Phase II

RESPONSIBILITY FOR COMPLIANCE :
Presidio Trust Forester and Natural Resource Program Manager / NPS Wildlife Biologist

METHOD :
Presidio Trust / NPS Grounds Maintenance Programs

ENFORCEMENT :
Incorporate Measures into Implementation Plans