

Appendix A

**Biological Study and Analysis of Conserved
Habitat for Amendments to the Habitat
Conservation Plan for San Bruno Mountain
and Incidental Take Permit PRT 2-9818**

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for
Amendments to the
Habitat Conservation Plan
for San Bruno Mountain
and
Incidental Take Permit PRT 2-9818

Prepared for:

County of San Mateo and the City of Brisbane

Prepared by:

TRA Environmental Sciences

October 2007

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I. Introduction and Summary of the Amendments

In accordance with the provisions of the San Bruno Mountain Habitat Conservation Plan ("HCP") and the Agreement with respect to the San Bruno Mountain Habitat Conservation Plan ("Implementing Agreement"), this report provides a biological study of the proposed amendments ("Amendments") to the HCP.¹ The Amendments would adjust the boundaries of Conserved Habitat within the Northeast Ridge (Administrative Parcel 1-07) and provide supplemental HCP funding provisions that would allow additional management and monitoring activities to occur. These changes are made following the amendment procedures outlined in the HCP, specifically the "Amendments for Exchange of Equivalent Conserved Habitat Prior to Grading" and "All Other Amendments" procedures in section V.F. of the HCP, and reiterated in section IX of the Implementing Agreement. The study evaluates the proposed change to the boundary of the Conserved Habitat and considers the effect of this action, and ongoing management and monitoring activities, on the callippe silverspot butterfly (*Speyeria callippe callippe*) and other listed species that currently occur or have been historically documented on the Mountain, including the mission blue butterfly (*Icaricia icarioides missionensis*), San Bruno elfin butterfly (*Callophrys mossii bayensis*), bay checkerspot butterfly (*Ephydra editha bayensis*), San Francisco garter snake (*Thamnophis sirtalis tetrataenia*), and California red-legged frog (*Rana aurora draytonii*). It also considers the effects of grading that has occurred in 2007 for the installation of infrastructure and other drainage and slope stability improvements deemed necessary by the City of Brisbane for public health, safety, and welfare reasons ("2007 Infrastructure Grading").

The amended HCP and this biological study are supporting documents for an application to the U.S. Fish and Wildlife Service ("USFWS") to amend the incidental take permit ("ITP") under section 10(a) of the federal Endangered Species Act.² Although the callippe is a species of concern in the HCP and was one of the two primary species the HCP was designed to conserve, the butterfly was not listed under the Endangered Species Act at the time the HCP was initially prepared and the ITP was issued. After the listing of the callippe in 1997, HCP permittees halted activities that may result in take of the callippe pending receipt of take authorization from the USFWS. The City of Brisbane seeks to amend the HCP to allow the completion of development activities within the Northeast Ridge, an area planned for urban uses under the HCP, and to apply for an amendment to the ITP to allow take of callippe by these actions. Both the City of Brisbane and the County of San Mateo, the Plan Operator and Habitat Manager, (collectively, the "Amendment Applicants") seek authorization to conduct more intensive habitat management (utilizing burning and grazing) within Conserved Habitat for the benefit of the callippe and the bay checkerspot butterfly. The Amendments and the management and monitoring activities they facilitate will contribute to the conservation of the callippe and the Mountain's other listed species. The change in configuration of the Conserved Habitat authorized by the Amendments would reduce potential impacts to callippe because the new configuration has a smaller

¹ Unless otherwise specified, all capitalized terms have meanings defined in the HCP.

² Take authorization for other listed species, including the mission blue butterfly, is currently provided under the HCP and ITP, but this study briefly assesses the impacts of the changes addressed by these amendments on the Mountain's other listed species and designated critical habitat.

development footprint than the current USFWS-approved operating plan for the Northeast Ridge and preserves high value hilltop habitat that would have been impacted under the existing approved plan (1989 VTM). The Amendments would also significantly expand the funds available for habitat management and monitoring throughout the Mountain by increasing the HCP's annual charge for the new homes to \$800 in 2005 and subject to the HCP's annual adjustment for inflation (approximately \$850 in 2007) and by establishing a \$4,000,000 non-wasting endowment. After the listing of the callippe, habitat management and monitoring have continued pursuant to the HCP, but certain activities (i.e., grazing and burning) that may result in take of individual butterflies have not been undertaken even though the activities would be beneficial to the Mountain's population of listed species, including the callippe. The Amendments would allow these management activities to occur and would provide critical funding to support their implementation. Both the revised Northeast Ridge development plan and habitat management and monitoring were analyzed by the USFWS's biological opinion (1-1-06-F-0937), which concluded these and other activities would not jeopardize the continued existence of the callippe and other listed species or result in adverse modification of designated critical habitat.

To cover these activities, the HCP will be amended pursuant to the provisions of the Implementing Agreement. Changes to the boundary of the Conserved Habitat in the Northeast Ridge operating plan will be processed as an exchange of equivalent Conserved Habitat prior to grading (Section IX.A.3 of the Implementing Agreement). The adjustment in the HCP funding provisions and clarification of the HCP's management and monitoring program will be processed under the provisions outlined for all other amendments to the HCP (Section IX.B of the Implementing Agreement). Amendments under both sections require a biological analysis of the proposed changes, which is contained in this report.

The revised operating plan for the Northeast Ridge results in Conserved Habitat that is larger in size and higher in biological value than the habitat being lost as a result of the Amendments. The revised operating plan has a reduced development plan that avoids impacts to a hilltop area important to the species' mating practices, reduces impacts to the callippe's host plant habitat by approximately 50% (including both temporary and permanently disturbed areas) compared to the development plan currently approved in the HCP, and decreases habitat fragmentation by removing a cluster of development in the hilltop area. As noted above, the supplementary funding provisions that apply to the additional development within the Northeast Ridge would also generate critical funds to support a significant expansion of management and monitoring to address the two primary threats to callippe habitat—invasive species and coastal scrub succession—across the Mountain.

The Amendments to the HCP do not conflict with the Plan's primary purpose of providing for the indefinite, long-term perpetuation of the mission blue and callippe and other species of concern. Impacts to callippe and other listed species from the remaining development within Northeast Ridge are significantly reduced from impacts otherwise authorized under the HCP. Supplementary funding allows for additional management and monitoring activities to be undertaken, which will significantly benefit listed species. Management and monitoring activities are a continuation of existing practices and are beneficial to the species.

Section II of this study provides a detailed description of the development and habitat management and monitoring activities covered by the Amendments, and Section III describes the specific amendments to the HCP and ITP that are proposed. Section IV analyzes the changes to Conserved Habitat resulting from the reduction in the Northeast Ridge development, as required for an exchange of equivalent habitat. Section V analyzes the impacts of the Northeast Ridge development, the adjustment in the HCP funding provisions, and clarification of the Plan's management and monitoring activities, as required for all other amendments to the HCP. Section VI presents the findings required for amendments processed under each procedure. The text of the amended portions of the HCP is included in Appendix A. The San Bruno Mountain Habitat Management Plan 2007 (HMP) is included in Appendix B. The environmental impacts of the proposed changes will be studied as required by NEPA, and the public will have an opportunity to comment on the proposed changes through public hearings held by the Amendment Applicants and through the public comment period provided by the USFWS and published in the Federal Register.

II. Activities Covered by the HCP Amendments

A. Reconfiguration of Conserved Habitat and Proposed Development within the Northeast Ridge

1. Prior Development within the Northeast Ridge

The Northeast Ridge, HCP Administrative Parcel 1-07, covers 228 acres located in the northeast corner of San Bruno Mountain. It is bounded on the south by the Crocker Industrial Park, on the north and east by Guadalupe Canyon Parkway and on the west by a PG&E transmission line and open space lands to be dedicated to the HCP Conserved Habitat (Figure 1). It has a hilly terrain that supports four vegetation types: annual grassland, coastal scrub, riparian scrub, and introduced invasive species (e.g., blue gum eucalyptus (*Eucalyptus globulus*), French broom (*Genista monspessulana*), and fennel (*Foeniculum vulgare*), among others).

The Northeast Ridge has been designated a Planned Parcel in the HCP since its completion in 1982. The City of Brisbane approved a tentative map in 1982 for development of 1,250 residential units within the Administrative Parcel. A revised project was subsequently submitted to the City for consideration. The revisions included a change in the type and location of units and reduced the total number of dwelling units to 579. The revised project also was phased over time. In 1989, the City approved a vesting tentative map ("1989 VTM") for the revised project, and the USFWS approved an Equivalent Exchange Amendment for this revised design in 1990. Over 135 acres were to be dedicated as Conserved Habitat (Administrative Parcel 1-07-03). See Figure 2 for the 1989 development configuration.

Consistent with these approvals, portions of the Northeast Ridge were developed. The first development phase (Unit I) included three residential neighborhoods (Neighborhoods I, II, and III) with 428 dwelling units and community facilities. In total, development of Unit I, which is substantially built and occupied, permanently disturbed 66.99 acres. Construction of 17 units in Unit I is underway.

In 2007, grading to construct a road, repair drainage features and conduct associated slope stabilization measures was conducted within a 6.74-acre area north of Unit I. Approximately 5.67 acres of this area had been previously disturbed by grading related to construction of Unit I in 1995 and 1996. Approximately 1.07 acres of the grading occurred in previously undisturbed area outside the HCP fence location at that time (Figure 3). The City determined these repairs were needed for public health, safety and welfare reasons. Prior to City approval of construction, the USFWS was informed of the proposed relocation of the HCP fence and the grading that would occur in previously undisturbed areas, and the work was documented and disclosed through the Site Activity Permit notification process. The Site Activity Permit notification also described compensation for habitat impacts, which is consistent with those proposed for activities covered by these Amendments. The USFWS responded that it would not obstruct activities that were deemed necessary to prevent loss of human life or property. A copy of Site Activity Permit for the 2007 Infrastructure Grading and the USFWS's response are provided in Appendix C. Although the 2007 Infrastructure Grading has already occurred, the impacts to the callippe and its habitat are evaluated in this study.

After the USFWS listed the callippe in 1997, Brookfield Northeast Ridge II LLC and the City of Brisbane worked with the USFWS to consider the feasibility of further avoidance and minimization of potential impacts from the development of the second and final phase, Unit II. As approved under the 1989 VTM and the 1990 Equivalent Exchange Amendment, Unit II included development of two additional neighborhoods (Neighborhoods I and II) with a total of 168 dwelling units in approximately 25.6 acres (and an additional 14.4 acres of temporary disturbance). The parties agreed to abandon development within one of the neighborhoods (Neighborhood I) in order to avoid impacts to habitat along the hilltop and to reconfigure development of the other neighborhood (Neighborhood II) to reduce impacts to callippe habitat. These changes increase the size of the Conserved Habitat within the Northeast Ridge by 8.93 acres and reduce the amount of temporary disturbance by 11.43 acres.

2. Development Authorized by These Amendments

These Amendments authorize development of the 2007 VTM, as shown in Figure 4, including the following activities:

- Grading 19.64 acres of undisturbed areas for Unit II, Neighborhood II, including 16.67 acres that will be permanently disturbed and 2.97 acres that will be disturbed temporarily and then revegetated pursuant to HCP criteria. This includes 1.07 acres of grassland that was impacted by the Infrastructure Grading, construction, use, and maintenance of 71 single-family detached home lots, including association common areas and City-owned emergency vehicle access ("EVA") and roadways within the permanently disturbed areas shown on Figure 4.
- Landscaping and maintenance of common areas, including revegetation and management of temporarily disturbed areas and installation and maintenance of fuel management zones shown on Figure 4 pursuant to HCP criteria.
- Installation, operation, and maintenance of required public or association-owned infrastructure, sidewalks, community fencing or walls, streetlights, traffic signs and signals, drainage facilities (including concrete v-ditches), and utilities (including, but not limited to, water, sewer, electricity, gas, telephone, and cable).
- Construction and use of the EVA road shown on Figure 4.
- Monitoring required for the installation, construction, or operation of any of the features described in this section.

Development of the community approved in 2007 VTM (Unit II, Neighborhood II) will permanently disturb 16.67 acres of land for the construction of homes and streets and the installation of other infrastructure and landscaped areas. An additional 2.97 acres would be disturbed temporarily for remedial grading, which would be restored pursuant to the criteria in the HCP to become part of the Conserved Habitat. A fuel management zone covering 1.44 acres will extend from portions of the developed area, as shown in Figure 4. Approximately 1.03 acres of the fuel management zone will be located within the temporarily disturbed areas that will be restored pursuant to the HCP; the remaining 0.41 acre is located within otherwise undisturbed

areas. As required by the City, the fuel management zone will not be irrigated and will be periodically maintained by removing woody vegetation. Concrete v-ditches will be installed on the graded and restored slopes at the perimeter of the wet landscaping area on the property to convey storm water runoff. Where they occur within restored areas that become part of the Conserved Habitat, maintenance within the fuel management zone and of the drainage improvements will be funded by the development's homeowners association ("HOA") and will be carried out in coordination with the Habitat Manager through the Site Activity Permit process in order to avoid and minimize potential impacts to sensitive habitat.

The primary access to the 2007 VTM development will be from the south via existing streets in the adjacent community (Unit I, Neighborhood II). An EVA approximately 20 feet wide and 180 feet long will connect the northern corner of the community ("C" Court cul-de-sac) to Guadalupe Canyon Parkway. Access to this EVA, which will be concrete, will be limited by locked gates to emergency vehicles only.

Portions of the perimeter of the community may have a 4-foot high catchment (retaining) wall where lots and roadways are adjacent to the Conserved Habitat. These walls help to reduce the amount of grading needed to stabilize the slopes, thereby minimizing impacts to grassland habitat. The areas where walls may be placed include a portion of "C" Court in the northern tip of the development and the easterly edge of "A" Street in the southern end of the development.

The development of 2007 VTM will be conducted with the avoidance, minimization, and mitigation measures required in the HCP. Additional measures will also be undertaken:

- Each unit in 2007 VTM will pay an annual charge of \$800 (2005 dollars) to be adjusted annually for inflation pursuant to an existing subdivision improvement agreement with the City of Brisbane.³ This amount (approximately \$850 in 2007) represents a substantial increase to the amount required under the HCP. Like the existing annual HCP charges, the amount will be adjusted annually in accordance by reference to the Consumer Price Index for Urban Wage Earners and Clerical Workers within the San Francisco-Oakland-San Jose area, as reported by the U.S. Department of Labor's Bureau of Labor Statistics;
- Brookfield Northeast Ridge II LLC will fund a \$4,000,000 non-wasting endowment to be managed by the HCP Trustees for the ongoing habitat management and monitoring activities of the HCP. The endowment is to be funded incrementally pursuant to an agreement with the City of Brisbane.⁴ Including the contributions that have already been paid for the 17 homes in Unit I that were recently constructed or are currently being built, the endowment will total \$4 million and is expected to generate over \$200,000 per year in interest for the HCP Trust. The combined sum of the 2007 VTM proposal would

³ A similar agreement also requires the 17 homes under construction in Unit I to pay an \$800 annual HCP charge, to be adjusted each year for inflation.

⁴ A similar agreement requires Brookfield Northeast Ridge II LLC to contribute towards the proposed endowment for the 17 homes that are under construction or have been recently completed in Unit I. These fees have already been paid.

increase the HCP annual revenues utilized for habitat management by approximately \$275,000 per year (2007 dollars). Current (2007) HCP revenues for habitat management and monitoring are approximately \$130,000 per year. The management would be done in accordance with the HMP, as described in Section II.B; and

- Brookfield Northeast Ridge II LLC will fund the management of both the undisturbed and the restored Conserved Habitat for a period that extends 5 years after the recordation of a final map covered by these Amendments.

The City of Brisbane prefers that grading and installation of infrastructure and all-weather surfaces be completed within a single dry-season (roughly April through October) in order to minimize potential storm water runoff impacts. Brookfield Northeast Ridge II LLC anticipates that project grading and installation of infrastructure and all-weather roadways will require approximately 6 months. Contingent upon receipt of all required permits and approvals, grading is expected to commence in the spring of 2008 and to be completed in October 2008. Construction of individual dwelling units would continue during the wet season. If necessary due to delays in starting, grading activities could continue after October, but extensive and costly storm water runoff management measures would be required. A grove of eucalyptus trees are currently located within the proposed development area and proposed Conserved Habitat. Existing approvals related to the 1989 VTM require removal and thinning of these trees, which has been delayed due to the listing of the callippe. If the trees can be removed and thinned without impacting viola, removal may occur in the fall and winter of 2007-2008, prior to the start of nesting season, pursuant to existing approvals. Removal of the trees would be carried out after completion of a raptor survey and under the supervision of the Habitat Manager to ensure that no take of the callippe occurs. Tree removal would also be covered by these Amendments as a development activity and management measure if removal is delayed.

B. Management and Monitoring of Conserved Habitat

The Amendment Applicants seek an amendment to the ITP adding take authorization for the callippe and bay checkerspot butterfly for management and monitoring activities within existing and proposed Conserved Habitat carried out pursuant to the HCP, including the activities described in the HMP, which is attached as Appendix B.⁵ The HMP implements adaptive management requirements under the existing HCP and is focused on continuing the current habitat management methods that have proven to be successful, and utilizing additional methods to change the conditions that favor invasive species and brush on San Bruno Mountain. The additional funding will enhance the resources available to manage the existing grasslands for endangered species habitat, and will provide funding for a grazing and brush control program that would improve the San Bruno Mountain ecosystem for the benefit of covered species.

5 Take of other listed species for impacts resulting from management and monitoring activities and for development activities described in the HCP is currently authorized under the terms of the ITP. The Amendment Applicants seek take authorization for the callippe and bay checkerspot because the species were listed after the HCP was completed and the ITP was issued.

The HMP has been reviewed by the USFWS and the HCP Technical Advisory Committee ("TAC") and is scheduled for approval by the Trustees, who have agreed to provide the USFWS with notice and an opportunity to comment on future revisions prior to approval. The HMP, which includes a statement of biological goals and objectives and an adaptive management program, will be revised as needed.

1. Vegetation Management Activities

There are currently approximately 2,730 acres of Conserved Habitat (including parks and land dedicated under the HCP) on San Bruno Mountain. Much of these lands provide habitat for the Mountain's listed butterflies, as well as the other rare and endangered species that inhabit it. Habitat management activities are authorized under the HCP, and since the 1990s, habitat maintenance has been guided by management plans, which had been updated every five years. Periodic revision of the management plans has allowed the Mountain to be adaptively managed. 65 Fed.Reg. 35248 (June 1, 2000).

The current HMP attached as Appendix B continues the adaptive management practices but is designed as a long-term management plan to be revised as needed rather than updated every five years. The HMP divides the Mountain into 13 management units. Land within each unit is prioritized into four categories. Priority 1 areas, which cover approximately 1,292 acres across the Mountain, cover the core habitats for the listed butterflies. It consists of primarily of grassland habitat, but also includes areas of coastal scrub. Priority 2 areas (495 acres) cover additional grassland habitat and areas of grassland habitat that have converted to coastal scrub since the HCP was adopted. These areas often provide important movement corridors for listed butterflies. Priority 3 areas (884 acres) include coastal scrub habitat and native oak woodlands and riparian areas, which contain only limited habitat for the listed butterflies. Priority 4 areas (248 acres) are areas with significant, dense infestations of invasives, including eucalyptus, gorse, and French broom. The HMP focuses on containing invasives within these areas and recommends, because of the expense involved, that removal and restoration be pursued using grant funds or other funding sources not generated through the HCP.

Within each unit, specific management activities are prescribed to counteract processes, such as brush succession, build up of thatch and non-native species invasion that adversely affect the amount and quality of the Mountain's grassland areas. Techniques include the following. In many cases, a combination of these techniques will be warranted.

Hand Work: Hand removal of invasive plants is an effective method for eliminating clusters of invasive plants, especially seedlings and plants whose root structure is not prohibitively deep or large. Hand removal involves identifying the target species and then sending crews out to either pull plants out of the ground, use a weed wrench to remove bigger plants, or cut down plants with an ax maddox or chain saw. The plants removed are piled up and either manually removed, burned, or allowed to decompose over time. Hand removal of weeds has the benefit of selectively removing weed biomass from sensitive areas.

Flaming: Flaming involves using a gas torch to pass intense heat over the leafy parts of an undesirable plant. It can be used on young, emerging weeds without affecting established, desirable plants and it leaves no residue. Flaming is not effective on weeds with underground

reserves. Flaming may be effective on invasive species such as French Broom, and would only be used during the wet season, during appropriate conditions.

Herbicide Application: Herbicide control is typically used on mature, dense stands of invasives that are more cost effective to spray than remove by hand. Most invasive pest plant infestations treated with herbicide are treated 2 to 3 times per year by foliar spraying. The initial treatment typically has a 95% kill rate followed up with routine maintenance every six to twelve months for up to three years until the infestation is killed. Ongoing maintenance and monitoring is required after three years. Herbicide application is conducted on the Mountain because it can be conducted faster than handwork and is more cost effective. Herbicide application over successive years, however, can create a dense layer of thatch, and this additional biomass on the soil tends to favor colonization by nonnative annual grasses, herbaceous weeds, and coastal scrub succession.

Livestock Grazing: Grazing is the utilization of grassland (forage) by domestic livestock such as cattle, sheep, goats, or horses. Where appropriate, re-introduction of grazing can be an effective means of maintaining the grassland habitat by reducing brush and tall annual grasses which out-compete native grassland plants, including the butterfly host plants. Grazing has yet to be used on a large scale on San Bruno Mountain for habitat enhancement purposes. Depending upon a variety of factors, grazing can have a positive (encourage more natives) or negative (stimulate more invasives and erosion) impact upon a landscape. The number of animals, type of animals, duration and frequency of grazing events, and vegetation type are all variables that will influence the results of grazing. Grazing will effect soil compaction, soil nutrients, light, and both native and nonnative vegetation. Livestock type may be the most critical factor to consider due to the variation in diet preferences for different species. While it is possible that a significant improvement in the landscape from grazing may occur immediately, it typically takes at least a 2-4 years to obtain significant results. Over time, a consistent practice of grazing in the early spring can result in reduction of weedy annuals and perpetuation of native grasslands and native annual wildflowers. Grazing can also be an effective tool for managing fire buffers.

Prescribed Burning: Prescribed burning is defined as fire applied in a knowledgeable manner to fuels on a specific land area to accomplish predetermined, well-defined management objectives. The introduction of a burning regime similar to what occurred historically on San Bruno Mountain could be instrumental in achieving long-term sustainability of the grasslands and butterfly habitat on the Mountain. However, because the Mountain is an open space area that is surrounded by dense urban and suburban development, the ability to allow wildfires to burn or to implement prescribed burning on a regular basis (if even at all), is not a reliable option for habitat managers. Given the constraints, micro-burns (burns on the order of a few hundred square meters or less, and contained in fire-proof fencing) might prove useful and feasible. These small burns can aid in combating localized weed or scrub infestations or thatch build-up and may be more easily permitted. To be an effective tool for the maintenance of grasslands, micro-burns would need to be conducted in the summer or fall to meet grassland maintenance goals. If prescribed or micro-burning is employed for managing vegetation, it would occur under the direction of the California Department of Forestry and Fire Protection ("CDFFP"), and implementation would require the assistance of CDFFP, the County of San Mateo, the Bay Area Air Quality Management District ("BAAQMD"), and local fire departments. Any burning

conducted will be consistent with The San Bruno Mountain Community Wildfire Protection & Fire Use Plan (CDF and TRA 2005).

Pile Burning: Pile or slash burning are an integral part of the habitat management program. This technique is important for reducing the accumulation of brush (wildfire fuels), and for decreasing native scrub and invasive species coverage. Pile burning can be conducted safely during the winter months when the surrounding vegetation is wet and fuel moisture levels are high, and the risk of fire escape is negligible. Combined with mowing and/or grazing, it is an excellent technique for opening up areas for conversion to grassland and for preparing areas for replanting. Post disturbance follow-up weed control is critically important to control the flush of weeds that may occur in areas following clearing and pile burning activities.

Mowing: Mowing has shown to be an effective tool and is used frequently as part of the current ongoing habitat management of the Mountain. Mowing can be used to depress woody and weedy invasive species in the same manner as grazing and burning. Mowing has been found to be effective at reducing annual grasses and providing a competitive advantage to native species, including the host plants for the mission blue butterfly. It is especially useful within highly sensitive areas, to avoid impacting rare species. It cannot be effectively implemented on a large scale to address annual invasive species, however, due to the large size of the Conservation Area (over 2,700 acres) and the steep topography on much of the Mountain. Mowing needs to be conducted repeatedly, 2 to 4 times per year, and prior to invasive species seed set. Mowing can be done with a tractor mower for large areas, or with a weed-eater for small areas.

Mechanical Clearing: Clearing of unwanted brush and trees, such as broom, gorse, coyote brush, Monterey pine and eucalyptus may be accomplished by a variety of means. Private contractors, the California Conservation Corps, County Fire Safe crews, and CDF prison crews have been used for brush clearing projects on the Mountain. Mechanical methods for brush and tree removal may also successfully meet management goals, but generally at a higher cost. A Brontosaurus (a large cutting head mounted on a tracked caterpillar) can effectively remove brush where hand removal or grazing is not feasible. The Brontosaurus removes and chips brush and small trees in a single operation. Mechanical clearing must be conducted carefully to minimize soil disturbance.

Replanting/Restoration: Restoration activities on the Mountain may include re-seeding, Mycorrhizal inoculation, nutrient fixation, and replanting. In areas that have long been dominated by invasives, the density of the native seed in the soil may be markedly diminished. Re-seeding with locally grown, native seed can be used in specific areas that have had invasive species control work, a high erosion potential and/or are located within habitat restoration islands. Mycorrhizal inoculation may include reintroduction of fungi, which grow into the root tip cells of the plants and form a symbiotic relationship with them, to coastal sage scrub restoration sites. Nutrient fixation can be done through the addition of recalcitrant mulch, such as bark or wood chips, to the soil. Replanting has been used with success on San Bruno Mountain when areas have been properly selected and when thorough follow up work has been done to protect plantings. Smaller habitat islands, approximately 1 acre or less, are managed more easily and can provide habitat for the endangered species once plants are established and maintained for a few years (San Bruno Mountain Annual Reports 2002–2006 [TRA 2007]).

Successful habitat islands have been created within the undisturbed Conserved Habitat, as well as on development slopes.

2. Monitoring Activities

The HCP requires monitoring to ensure compliance with the terms of the HCP and to evaluate effectiveness of ongoing conservation efforts. Monitoring includes recording regular observations of biological processes and conservation activities on the Mountain. The purpose of monitoring is to assure that the HCP conditions are being met in practice, and to keep an ongoing record of the progress of Plan implementation. This allows the Plan Operator to conduct periodic re-evaluation of the vegetation management activities underway and modify them as appropriate. Monitoring would be structured to provide sufficient information for ongoing review. The intensity of monitoring depends upon the goals of the monitoring, and corresponds to the scale of activities being evaluated (construction and/or management techniques). To guide habitat management decisions, monitoring of initial experimentation of management techniques needs to be more intensive than monitoring done after techniques are established.

Most monitoring activities are conducted by the Habitat Manager, whose familiarity with listed butterflies and their host and nectar plants ensures that monitoring will result in minimal impacts to the species. Any monitoring (including research) carried out by other entities or individuals will be coordinated with the Habitat Manager through the Site Activity Permit process.

The HCP does not detail specific monitoring methods. The HMP's monitoring program is intended to implement the monitoring requirements of the HCP based on contemporary scientific practices. As described in the HMP, monitoring consists of monitoring the relative abundance of the butterfly species and their habitat over time. It does not involve habitat modification or any other activities that could affect the Mountain's butterflies. The HMP includes the following monitoring methods.

Endangered Butterfly Monitoring: Endangered butterfly monitoring conducted over the 25-year span of the HCP has focused on assessing the distribution and/or relative abundance of the federally endangered mission blue, callippe, and San Bruno elfin butterflies on the Mountain. All three butterflies have low growing host plants that can easily be overgrown by weeds and/or coastal scrub vegetation, and all three species overlap in their distribution on the Mountain. Two monitoring systems have been used to monitor the endangered species on the Mountain: set transects and wandering transects. The 2007 HMP directs continuation of the current set transect monitoring system.

Rare Plant Surveys: Rare plant distribution data has been collected in GIS format within the last 5 years for listed and non-listed plant species with very limited distribution on San Bruno Mountain. This includes all of the manzanita species on the Mountain (*Arctostaphylos ssp.*), Diablo rock rose (*Helianthella castanea*), San Francisco lessingia (*Lessingia germanorum*), San Francisco spineflower (*Chorizanthe cuspidata var. cuspidata*), San Francisco campion (*Silene verecunda ssp. verecunda*), and dune tansy (*Tanacetum camphoratum*). The 2007 HMP directs GPS mapping of all the special status rare plant species on a cycle of once every three years on the Mountain to track changes in distribution and monitor health of these colonies.

Monitoring of Additional Species: Monitoring for additional species (e.g., bumblebees and ants) may be conducted and academic research on the Mountain is encouraged to provide this additional information. HCP monitoring funds are focused on the endangered species and their habitats, as required under the HCP permit. While monitoring is focused on the butterflies of concern and rare plants, study and management of the Mountain's overall ecosystem will benefit the listed species.

Vegetation Management Effectiveness Monitoring: Vegetation management effectiveness monitoring is vital to recognizing changes to the ecosystem and to gauge the results of habitat management work. Effectiveness monitoring over the 25-year span of the HCP has been focused on tracking invasive species distribution and coastal scrub succession. Vegetation monitoring has been done using primarily two methods: daily tracking of work conducted and overall distribution of vegetation types and invasive species. To track large scale changes in vegetation, the 2007 HMP directs mapping using aerial ortho-photo interpretation and field checking, and recommends that the Mountain be remapped using this technique every 5 years. For finer scale monitoring, fixed transects, quadrats, and/or other methods would be used.

III. Proposed Amendments to HCP and ITP

The activities described in the previous section require the following amendments to the HCP and the ITP. The text of the proposed amendments to the HCP are attached as Appendix A.

- **Revised Operating Program for the Northeast Ridge.** Chapter VII will be revised to replace the current operating program for the Northeast Ridge (dated October 1990) in Chapter VII of the HCP to allow for the development of Unit II, Neighborhood II under the 2007 VTMM. The proposed change will reduce the amount of developed land, increase the size and value of the Conserved Habitat within the Northeast Ridge, and significantly expand the funding available for habitat management and monitoring.
- **Supplementary Funding.** Section V.B of the HCP will be amended to address the supplemental funding in the amount of \$4,000,000 provided by Brookfield Northeast Ridge II LLC for development of Unit II, Neighborhood II and the 17 homes in Unit I that are under construction or have been recently completed. These funds will set up an HCP Endowment, which will be funded incrementally pursuant to an agreement between Brookfield Northeast Ridge II LLC and the City of Brisbane. The HCP Endowment will be managed by the HCP Trustees and is expected to generate over \$200,000 per year in interest that would be available to fund the habitat management and monitoring activities described in the HMP. Section V.B will also be amended to require the City of Brisbane to increase the amount of the annual charge required under the HCP to \$800 (2005 dollars) per residential unit. The increased charge will apply to any future residential development that may be allowed within the portion of the Mountain under Brisbane's jurisdiction. The charge for commercial and industrial activities within Brisbane's portion of the Mountain will also be increased to \$55 (2005 dollars)/1,000 square feet for the first 100,000 square feet, \$37.50/1,000 square feet for the next 100,000 square feet, and \$28.50/1,000 square feet for any area in excess of 200,000 square feet; for purposes of application of this fee, the area of multiple buildings covered under a single project approval will be combined. All funds from the annual charge will be part of the HCP's Trust Fund and managed by the Trustees.
- **Additions to ITP.** Section V.G of the HCP will be amended to propose the addition of the callippe and bay checkerspot butterfly to the list of species covered by the ITP to allow the use of more effective management techniques and to cover the Northeast Ridge. The habitat management and monitoring activities described in Section II.B are currently authorized by and are being carried out pursuant to the HCP. However, use of some management techniques in areas containing viola could result in take of callippe. The addition of the callippe and bay checkerspot to the ITP would authorize the potential take of both during ongoing vegetation management and monitoring of the Conserved Habitat, and the potential take of callippe during vegetation management, replanting, and restoration following the final phase of the Northeast Ridge development proposed in the 2007 VTMM. Take of the callippe and bay checkerspot and impacts to their habitat would be authorized for habitat management activities that occur under the 2007 HMP and future iterations.

Changes to the boundary of the Conserved Habitat within the Northeast Ridge will be processed as an exchange of equivalent Conserved Habitat under the HCP and Section IX.A.3 of the Implementing Agreement. Other proposed changes to the HCP will be processed according to the terms required for all other amendments to the HCP in Section IX.B of the Implementing Agreement.

IV. Analysis of Conserved Habitat Boundary Changes within the Northeast Ridge

Section IX.A.3 of the Implementing Agreement describes the requirements for an amendment that would change the boundary of the Conserved Habitat: an amendment for the exchange of land designated as Conserved Habitat within land designated as a Development Area within the same Administrative Parcel if (1) "no grading has yet occurred after the issuance of the Section 10(a) Permit in the proposed new Conserved Habitat" and (2) "the amendment will provide new Conserved Habitat which is essentially equivalent in biological value and acreage to the habitat which will be lost as a result of the amendment." The HCP requires that such proposed amendments must be approved by both the local jurisdiction and the USFWS.

The 2007 VTM would change the boundary of the Conserved Habitat within the Northeast Ridge, as shown in Figures 2 and 4. As described earlier, an equivalent exchange amendment for the Northeast Ridge was approved in 1990, and the first phase of development plan approved by that amendment was constructed, resulting in a development area of 66.99 acres and Conserved Habitat of 66.39 acres. The Amendments, and therefore this analysis, address only the second and final phase, or Unit II. As demonstrated below, the proposed Amendments satisfy the criteria for an exchange of equivalent habitat because a) less habitat would be lost to development under the 2007 VTM; b) the quality of the new habitat conserved is of higher biological value (due to the protection of an important hilltop habitat area) and c) there is reduced potential for habitat fragmentation due to clustering of the development into one area rather than building in two separate areas. The proposed Conserved Habitat also has higher documented usage by callippe.

A. No Grading within the Proposed Conserved Habitat

None of the habitat within the proposed new Conserved Habitat has been graded. As noted below, approximately 2.97 acres of habitat will be temporarily disturbed for remedial grading during project construction, but will be restored as native grassland habitat.

B. Proposed Conserved Habitat is Larger in Size and Higher in Biological Value

The Amendments would create new Conserved Habitat within Unit II of the Northeast Ridge that is larger in size and higher in biological value than the habitat that will be lost by eliminating development (permanent and temporary disturbances) within an approximately 21-acre hilltop area. Only a small area (approximately 0.84 acre) of existing Conserved Habitat would be lost (i.e., developed) under the Amendments, and this area consists primarily of a eucalyptus grove, which does not provide habitat for the callippe. The net increase in Conserved Habitat is 8.93 acres. The reconfiguration of the Conserved Habitat boundary to allow development of the 2007 VTM reduces impacts to viola by reducing permanent and temporary disturbances and reduces habitat fragmentation by clustering development. These changes increase the biological value of the Conserved Habitat for the callippe due to the protection of an important hilltop area, and increase habitat area for the mission blue.

1. The Proposed Reconfiguration Results in a Net Increase in Conserved Habitat.

Under the 2007 VTM, the configuration of the remaining Northeast Ridge development and Conserved Habitat that is the subject of these Amendments has been substantially modified, as shown in Figures 2 and 4. Table IV-1 compares the size of development areas under each plan.⁶ Under the 1989 VTM, development in the second phase (Unit II) was to occur in two separate neighborhoods, Neighborhood I (NI), which was located on the hilltop on the eastern side of the parcel, and Neighborhood II (NII), which is immediately north of and adjacent to the existing community on the western side of the property constructed in the first phase of development. Together, these two neighborhoods would disturb a total of 40.0 acres, 14.40 acres of which would be restored. The 2007 VTM eliminates development of NI (the hilltop neighborhood) entirely and changes the size and configuration of NII. Under the 2007 VTM, the area permanently disturbed (i.e., where development would be located) is reduced by almost 9 acres, while the total disturbance area of 19.64 acres is less than half that currently approved in the 1989 VTM. Permanent impacts are reduced from 25.60 acres under the 1989 VTM to 16.67 acres in the 2007 VTM. Temporary impacts are similarly reduced from 14.40 acres to 2.97 acres.

Table IV-1. Development in Unit II, Neighborhoods I and II in 1989 and 2007 VTMs

Disturbance Area	1989 VTM		2007 VTM		Difference (2007 to 1989)
	NI (acres)	NII (acres)	NI (acres)	NII (acres)	
Permanent	13.90	11.70	0.00	16.67	-8.93
Temporary	7.30	7.10	0.00	2.97	-11.43
Total	21.20	18.80	0.00	19.64	-20.36

Reductions in the size of the development area increase the size of the Conserved Habitat, as summarized in Table IV-2. The 2007 VTM would increase undisturbed Conserved Habitat by 20.36 acres and would result in a net increase in Conserved Habitat by 8.93 acres. Because 66.39 acres of land were dedicated as Conserved Habitat as part of the development of Unit I, the total Conserved Habitat for the Northeast Ridge under the 2007 VTM is 144.66 acres out of the 228-acre parcel.

⁶ Disturbances reported in Table IV-1 do not include the areas disturbed by the 2007 Infrastructure Grading, including the 1.07 acres of previously undisturbed habitat or the 5.67 acres that had been previously graded.

Table IV-2. Conserved Habitat and Development Area in Unit II in 1989 and 2007 VTMs

	1989 VTM (acres)	2007 VTM (acres)	Difference (2007 to 1989)
Conserved Habitat			
<i>Undisturbed</i>	54.94	75.30	20.36
<i>Temporarily</i>	14.40	2.97	-11.43
<i>Disturbed/Restored</i>			
<i>Subtotal</i>	69.34	78.27	8.93
Development Area¹	25.60	16.67	-8.93
Total	94.94	94.94	0.00

Notes:

¹ Does not include area disturbed for 2007 Infrastructure Grading.

The biological significance of reductions in temporary impacts is explained in the following section.

2. The Proposed Conserved Habitat Has Higher Biological Value

The assessment of biological value of the approved and proposed Conserved Habitat are based on the following criteria, summarized in Murphy (1989):

- The callippe is a powerful flier and requires extensive contiguous grassland habitat to maintain its population. Callippe habitat is defined by the presence of extensive stands of viola, the species' larval host plant, and nectar sources. Major nectar resources for callippe include thistles (both native and non-native), coyote mint (*Monardella villosa*), buckeye trees (*Aesculus californica*), *Horkelia californica*, and *Scabiosa atropurpurea*. The callippe does not appear to be geographically limited by nectar availability.
- Hilltops are of particular importance to the callippe. Males fly to hilltops and wait for females to fly upslope for mating. Hilltops, therefore, merit special attention. Downslope areas contain most of the viola and nectar resources; therefore, a viable callippe habitat unit includes a local hilltop with contiguous downslope habitat.
- Hilltops also provide rock outcroppings which support lupines, the larval host plant of the mission blue. Hilltops are thus also high quality mission blue habitat.
- Disturbed callippe habitat should not be considered restorable due to difficulties in propagating viola by seed and the limited attempts to transplant viola. The HCP's primary management measure is protecting existing habitat by curbing the invasion of brush and by directing development around hilltops and contiguous downslope areas.
- Temporarily disturbed areas can be effectively restored as mission blue habitat by planting lupines and nectar sources. High quality mission blue habitat with documented presence of mission blue butterflies has been created within the temporary disturbance areas in Unit I, and in other areas within the HCP area.

- Small patches of mission blue host plants and nectar sources are considered viable habitat for that butterfly. Small isolated patches of habitat usually do not constitute viable silverspot habitat. Some areas that appear to have limited value as habitat for either species are valuable as corridors of dispersal between high quality habitat areas.

Reduced Impacts to Hilltops and Preservation of Viable Callippe Habitat Unit: Hilltop habitat is important for both butterfly species. Male callippes typically patrol for females back and forth on summits and ridgetops, while females fly uphill to mate and downhill to oviposit on viola. Hilltops also support lupines, the larval host plant of the mission blue. The 2007 VTM significantly reduces impacts to hilltop and downslope ovipositing habitat (for callippe) by eliminating the development of the Neighborhood I community. This area was previously characterized as "prime habitat for both butterfly species, particularly the [callippe]" by Murphy (1989), which noted that development of this area "has greater negative impacts than development in other Northeast Ridge areas." Because this area contains a local hilltop and contiguous downslope ovipositing habitat, the Amendments' proposed reconfiguration preserves a viable habitat unit for the callippe.

Changes in the configuration of Neighborhood II do not appreciably affect impacts on either target species. The 2007 VTM would expand grading slightly in the north and the east, but total disturbance area is increased only by 0.84 acres, due to reductions in temporary impacts. The additional area to the east includes an existing eucalyptus grove, which likely acts as at least a partial barrier for dispersal for both species. The area to the north includes a ridgeline on which callippe presence has been documented. However, grading will impact only the south side of the ridgeline and the topographic high point of the ridgeline will remain, and therefore continue to provide hilltopping habitat for callippe in the future. After grading, the area will be restored to grassland habitat. These impacts can be substantially offset through restoration for the mission blue and at least partially offset through restoration of nectar plants for the callippe.

Reduced Impacts to Grasslands, including Viola Habitat: Grasslands provide habitat for both the callippe and mission blue. The following table compares the loss of grassland habitat that would occur under the 1989 VTM and the 2007 VTM and compares those losses to the habitat within the Northeast Ridge and the entire Mountain.

Table IV-3. Comparison of Grassland Impacts under the 1989 and 2007 VTMs

VTM	Grassland Disturbed (acres)	Loss of Grassland Habitat ¹	
		within NER ² (%)	within SBM ³ (%)
1989 NI	20.12	16.24	1.56
1989 NII ⁴	9.19	7.42	0.71
1989 Total	29.31	23.66	2.28
2007 NI	0.00	0.00	0.00
2007 NII	10.94	8.83	0.85
2007 Infr. Grading	1.07	0.86	0.08
2007 Total	12.01	9.70	0.93
Amount of reduced impact	-17.30	-59.02	-1.34

Notes:

- ¹ The baseline conditions for grassland impacts includes the 1.07 acres that were disturbed by the 2007 Infrastructure Grading.
- ² Total of 123.87 acres of grassland on Northeast Ridge used in calculation.
- ³ Total of 1287 acres of grassland on San Bruno Mountain used in calculation.
- ⁴ Includes area disturbed by 2007 Infrastructure Grading.

Impacts to the mission blue from loss of habitat are estimated on the loss of grassland because lupine distribution data and counts are not available. Total grassland impacts in the 2007 VTM and from the 2007 Infrastructure Grading are 12.01 acres, compared to 29.31 acres of impacts under the 1989 VTM. Development of the 2007 VTM substantially reduces impacts to grassland habitat (permanent and temporary impacts) by 17.30 acres (59%) compared to development of the approved 1989 VTM.

Viola, the host plant for the callippe, was mapped on San Bruno Mountain in 2000, 2004 and 2005 (Figure 5). The 2000 mapping was conducted using field mapping on orthophotos, and the 2004 and 2005 mapping was conducted using handheld Trimble Explorer 3 GPS units. During the peak of the viola bloom period when viola is most visible, the entire Northeast Ridge was walked by two TRA biologists approximately 30 feet apart, and all viola patches and individual viola plants were mapped and plant numbers were estimated. The average viola acreage mapped in 2000, 2004 and 2005 within Unit II of the Northeast Ridge was 20.6 acres. An additional 6.3 acres of viola is located within the Conserved Habitat within Unit I, so the total area of viola for the Northeast Ridge is 26.9 acres.

In addition, all viola on the rest of San Bruno Mountain was mapped in 2004 and 2005. Due to the extensive area on San Bruno Mountain to be mapped (2700 acres), and the short window for mapping viola during the peak of its bloom period (approximately 2 weeks), the rest of the Mountain was mapped over the course of both 2004 and 2005 (i.e., one-half of the Mountain was mapped in 2004, and the other half in 2005). The total acreage of viola mapped within the entire HCP area was 133.5 acres. Impacts were evaluated using the mapping software program ArcView 3.2 to overlay and compare areas proposed for development (temporary and permanent

disturbance areas) with the viola habitat. Average viola acreage was used to evaluate impacts of the approved 1989 VTM and the proposed 2007 VTM (Table IV-4). Because of the difficulty of propagating viola, temporary disturbance areas were treated as a permanent loss of viola. The results are summarized in Table IV-4.

Table IV-4. Comparison of Viola Impacts under the 1989 and 2007 VTMs

VTM	Est. Viola Impacts (ac) ¹	Percentage Loss of Viola ² Within Unit II	Within SBM
1989 VTM	7.37	27.41%	5.52%
2007 Infrastructure Grading	0.77	2.87%	0.58%
1989 Total	8.14	30.29%	6.10%
2007 VTM	2.27	8.45%	1.70%
2007 Infrastructure Grading	0.77	2.87%	0.58%
2007 Total	3.05	11.33%	2.28%
Difference (% reduction of impacts between 1989 and 2007)	-5.1	-63%	-62%

Notes:

- ¹ Impacts are based on the average viola mapped in 2000, 2004 and 2005.
- ² Baseline conditions for viola include the viola disturbed by the 2007 Infrastructure Grading.

Including impacts that have occurred because of the 2007 Infrastructure Grading, total estimated viola impacts from the 2007 VTM are 3.05 acres, compared to 8.15 acres of impacts under the 1989 VTM. Development of the 2007 VTM substantially reduces impacts to viola habitat (permanent and temporary impacts) by 5.1 acres (63%) compared to development of the approved 1989 VTM (compare Figures 6A-C to Figures 7A-C). Total impacts in 2007 account for less than 11.33% of the viola within the Northeast Ridge and 2.28% of the viola across the Mountain (Figure 5), down from 30.29% and 6.10%, respectively, for the 1989 VTM. Under a worst case scenario that uses the highest estimates for permanent (2005 year), temporary (2004 year), and 2007 Infrastructure Grading impacts to viola from the 2007 VTM, viola impacts would be 3.53 acres.

The viola habitat areas impacted under the 2007 VTM are generally of lower value than the areas that will be protected by the 2007 VTM and have less documented observations of callippes than surrounding hilltop areas. Within the 2007 VTM development area, approximately 50% of the viola acreage that would be impacted is located downslope of a eucalyptus grove which forms a partial barrier between callippes utilizing nearby hilltop habitat along Guadalupe Canyon Parkway (Figures 6A-C). Based on callippe transect monitoring observations of this area in

2006, and general observations over the past 25 years of this area, the viola patches downslope of the grove are utilized less by callippe than viola habitat located upslope of the grove.

Preservation of Dispersal Corridors and Reduced Habitat Fragmentation: Habitat fragmentation is the division of habitat into smaller and more isolated patches and is often a result of development, but can also occur from vegetation changes. As habitat patches become fewer and more isolated the likelihood of adult butterflies dispersing from one patch to another decreases and limits the opportunities for genetic exchange among populations. The isolation of habitat can bring about the complete elimination of a species due to the increased edge/interface with invasive weeds or native brush and woodland communities, and a lack of habitat management. For grassland dependent species such as callippe, a mosaic of grassland habitat that includes hilltops and various slope exposures is important. A proportion of coastal scrub habitat would likely provide additional habitat resources (i.e., nectar plants, wind-protected perching sites).

The 2007 VTM results in less fragmentation than the 1989 VTM due to clustering of the development in Neighborhood II. The resulting Conserved Habitat is made up of a larger, contiguous grassland habitat block that includes the two primary hilltop areas on the Northeast Ridge-- Callippe Hill and an unnamed hill to the east. While Callippe Hill has been conserved as habitat through the HCP, the 1989 VTM would have severely impacted the unnamed hill to the east (Figures 7A-C). The 2007 VTM eliminates the Neighborhood I and preserves this important hilltop area that would have been impacted. The 2007 VTM increases the amount of development near Guadalupe Canyon Parkway, but it is not expected that this will present a significant barrier to callippe. Habitat would be protected on all four sides of the Carter Street/ Guadalupe Canyon Parkway intersection, including a narrow hilltop that will be partially temporarily disturbed. Callippe movement in this area is currently partially restricted by a 9.09 - acre eucalyptus grove that would be removed by the 2007 VTM. An EVA is proposed as part of the 2007 VTM, which will connect the development to Guadalupe Canyon Parkway. The EVA will have a smaller footprint and will be less trafficked than the public roadway planned in the 1989 VTM. The temporary grading in the area adjacent to Guadalupe Canyon Parkway in the 2007 VTM can be restored to provide hilltop habitat for the callippe and host plant habitat for the mission blue.

Due to the callippe's observed behavior of crossing the 4-lane Guadalupe Canyon Parkway (Figure 8), the 2007 VTM would not isolate portions of the callippe population from one another. Furthermore, the lands along the parkway should continue to function as an important habitat area and dispersal corridor for both the mission blue and callippe. Maintaining and/or improving the habitat quality of the lands along the Parkway through brush control and weed management will be important for the long-term sustainability of the species on San Bruno Mountain.

Overall Assessment of Changes in the Northeast Ridge Plan: The 2007 VTM is a major and significant improvement over the 1989 VTM. It significantly increases the size of the undisturbed Conserved Habitat and results in an overall increase in the total Conserved Habitat within Unit II of the Northeast Ridge. The biological value of the Conserved Habitat under the 2007 VTM is greater because it preserves a large contiguous grassland habitat area that includes biologically important hilltop habitat and downslope ovipositing areas that would have been

impacted under the 1989 VTM. Impacts to grasslands and viola are significantly reduced by eliminating development in the hilltop area and clustering development in Neighborhood II. The 2007 VTM also provides significant funding that could enhance important butterfly habitat and dispersal corridor for both species along Guadalupe Canyon Parkway.

V. Biological Study of Other Proposed Amendments and Ongoing Habitat Management Activities

Section IX.B of the Implementing Agreement allows a participating entity to amend the HCP in a manner not covered by an amendment process otherwise defined in the HCP. This process is being used to amend the HCP and propose the authorization of the take of the callippe silverspot butterfly in the specific areas designated for development under the 2007 VTM within the Northeast Ridge, and to propose the authorization of the take of the callippe silverspot butterfly in conjunction with maintaining and monitoring of Conserved Habitat as part of the implementation of the HMP. Amendments approved pursuant to this provision require the written agreement of the affected landowner, a noticed public hearing held by the local agency having land use regulatory authority, and written approval of the local land use authority. If the amendment has potential to impact Conserved Habitat then written approval is also required by San Mateo County and the USFWS. They must also be supported by a biological study demonstrating that the amendment does not conflict with the primary purpose of the HCP to provide for the indefinite, long-term perpetuation of the mission blue and callippe and other species of concern. This section analyzes the biological impacts of the proposed amendments and ongoing habitat management activities.

A. Environmental Setting/Baseline

Land Use

Existing land uses on the Mountain include: a 2,700 acre State and County Park, an active rock quarry, telecommunications and public utility facilities, and residential and commercial development. Since 1983, when the HCP was approved by the USFWS, approximately 331 acres of the Mountain have been developed, including 66.69 acres within the Northeast Ridge. An additional 40 acres are planned for development in the Northeast Ridge under the HCP, although these Amendments would reduce the remaining planned development to 19.64 acres (permanent and temporary disturbances). An additional 256 acres are designated as unplanned parcels under the HCP, mostly in the Quarry and Brisbane Acres. Approximately 2,730 acres have been dedicated or are in the process of being dedicated as Conserved Habitat, in addition to 81 acres that have been graded and restored. The Conserved Habitat includes State and County parklands, as well as DFG lands that are managed through the HCP under cooperative agreements. Figure 9 shows the existing developed and protected lands on the Mountain. Figure 10 identifies specific parcels.

Callippe Silverspot Butterfly

The callippe silverspot butterfly (*Speyeria callippe callippe*) was proposed for listing as endangered in 1978 (USFWS 1978), but the proposal was retracted in 1979 (USFWS 1979) following substantive changes to the Act. Another proposal to list this butterfly was published in 1980, but it was not completed because of procedural limitations. A petition to list the animal was submitted to the Service in 1991, a proposed rule was published in 1994 (USFWS 1994), and a final rule listing the species as endangered was published on December 5, 1997 (USFWS 1997).

The callippe is a medium-sized butterfly in the brush-footed butterfly family, Nymphalidae, with a wingspan of approximately 2.2 inches. The upper wings are brown with extensive black spots and lines, and the basal areas are extremely melanic. The undersides of the wings are brown, orange-brown, and tan with black lines and distinctive black and bright silver spots. Basal areas of the wings and body are densely pubescent.

The callippe is endemic to the grassy hills surrounding the San Francisco Bay. Urban development and other threats, such as invasive species, brush succession, air pollution, trampling by hikers and equestrians, off-road vehicle use, illegal collection, concomitant with huge increases in the human population have drastically altered this landscape, causing the callippe's decline and endangerment. Today, only four populations of this species are known to remain, of which San Bruno Mountain is the largest. While annual monitoring of the callippe population has been ongoing on San Bruno Mountain since 1981, very little information about the abundance of callippe butterflies at any other locality is available.

The callippe occurs in grassland areas where the butterfly's larval food (host) plant is located, where adult nectar plants are present, and on ridges and hilltops where courtship and mating take place. Refer to Figure 11 for the general distribution of the callippe on San Bruno Mountain as mapped in 2004. The larval food plant, or host plant, for callippe is *Viola pedunculata*. See Figure 5 for the distribution of viola on San Bruno Mountain. The presence of this plant is required for the survival of the species. The callippe also requires the presence of adult nectar plants, and utilizes a variety of native and nonnative species including coyote mint (*Monardella villosa*), brownie thistle (*Cirsium quercetorum*) Italian thistle (*Carduus pycnocephalus*), and pin-cushion plant (*Scabiosa purpurea*). The particular species of nectar plant is not as important as the presence of a variety of suitable and abundant nectar plants in the same area as the host plant, the viola. Callippes also require high points on the landscape, typically ridges and hilltops, where courtship takes place. Males patrol hilltops searching for mates, and stake out and defend territories on hilltops. These topographic features are important for successful reproduction of the species.

B. Assessment of Potential Impacts to Callippe Resulting from the Amendments

The Amendments would allow the completion of development activities in the Northeast Ridge and add supplemental funding that would allow for comprehensive habitat management and monitoring to be conducted throughout the Mountain's Conserved Habitat, including areas where viola occurs. This section considers the potential effects of these activities on the callippe.

1. Urban Development within Northeast Ridge

Both direct and indirect impacts to callippe are likely to occur during construction activities for the 2007 VTM. The project has incorporated conservation measures that avoid and minimize these impacts.

Construction activities would likely affect the callippe at the egg, pupae, chrysalis, and/or adult stage of its lifecycle. Direct impacts to the callippe could result from the ground disturbance caused by construction activities, which would destroy the species' host plant, as well as potentially impacting both adults, eggs and/or larval butterflies, depending on the timing of

initiation of ground-disturbing activities. Impacts to butterflies include mortality from being crushed by heavy equipment or trampling by construction personnel. Mortality within the development area from heavy equipment and trampling should be minimized by the salvage provisions of the revised operating plan, although mortality and other non-lethal impacts could also result from the transplantation of viola.

Construction activities could also disrupt callippes attempting to nectar or oviposit near the project site. Frequent disturbance of an area may have negative impacts on reproductive success since callippe may have to make multiple attempts to successfully oviposit or forage without disturbance; may have to move to less suitable areas to forage or oviposit; or may have increased difficulty in locating a mate. Increased levels of dust caused by construction or other earth moving activities could clog the spiracles of butterfly adults and early larval stages located adjacent to or downwind of the site. This could result in butterfly injury or mortality (USFWS 1997).

Limiting grading to during the butterfly's flight season may reduce potential impacts to callippe larval and pupating butterflies near the project site from direct mortality. Timing construction to the dry season would allow at least some callippe individuals to fly out of harms way during construction activities and perhaps reproduce in other habitat areas. Though dust or other construction-related disruption is a potential impact on callippe adults, this impact is likely less severe than impacts from activities timed during the larval or chrysalis stage.

Direct impacts to callippe would result from the loss of host and nectar plant habitat. The extent of impacts of grassland habitat and host plants was discussed in detail in Section IV. In summary, the development of the 2007 VTM would require grading of 19.64 acres of undisturbed habitat, including 2.97 acres that will be restored pursuant to the HMP's restoration guidelines. An additional 1.07 acres of previously undisturbed habitat have been impacted by the 2007 Infrastructure Grading. The 16.67 acres that would be permanently disturbed and the 1.07 acres disturbed by the 2007 Infrastructure Grading include approximately 12.01 acres of grassland habitat. To put the loss of grassland habitat in perspective, approximately 122 acres of grasslands on San Bruno Mountain have converted to coastal scrub over the span of the HCP (1982 – 2004) (San Bruno Mountain Habitat Management Plan 2007). Moreover, as explained below, the additional funding that would be generated by the development of the 2007 VTM would fund management activities to curb the expansion of brush and reclaim areas that have converted to coastal scrub over the span of the HCP.

Development of the 2007 VTM would impact approximately 2.27 acres of viola habitat within the grassland areas to be disturbed. The 2007 Infrastructure Grading impacted 0.77 acres of viola. Together, these constitute approximately 2.3 percent of the viola habitat on the Mountain. It should be noted that this represents a significant decrease in impacts compared to the approved 1989 VTM, and further that Brookfield Northeast Ridge II LLC revised the development plan within Unit II-NII to avoid and minimize impacts to callippe habitat. After the callippe was listed in 1997, the USFWS, the City of Brisbane, and Brookfield Northeast Ridge II LLC considered ways to minimize development impacts on the callippe. The parties selected a revised development plan that, like the 2007 VTM, did not include construction of the Unit II-NI community located on hilltopping habitat. Development was instead concentrated in Unit II-NII. The TAC visited the site on December 18, 2006, and recommended further avoidance of viola

habitat in the northeast corner of the development area. In response, Brookfield Northeast Ridge II LLC and the City of Brisbane reconfigured development to limit temporary impacts in this area, reducing temporary impacts to viola by 1.93 acres (45.9 percent reduction). Overall, viola impacts have been reduced approximately 63 percent compared to the 1989 VTM. See Table V-1. This revised plan is the 2007 VTM examined herein.

Table V-1. Minimization to Reduce Impacts to Viola Habitat

Impacts	Initial 2007 VTM Proposal (acres)	Modified 2007 VTM Proposal (acres)	Difference: (acres/%)
Permanent	16.84	16.67	0.17 acres/ -1.00%
Temporary	4.82	2.97	1.85 acres/ -38.38%
Total	21.66	19.64	-2.02 acres/ 9.33%
Viola	4.2	2.27	-1.93 acres/ -45.9%

Notes:

1 Impacts for the 2007 VTM are based on the average of data from 2000, 2004, and 2005 viola mapping.

The annual variability of the distribution of viola helps to put the loss of viola habitat that would be caused by the development of the 2007 VTM and the 2007 Infrastructure Grading into perspective. Viola habitat within the Northeast Ridge was mapped in 2000, 2004, and 2005. The 2007 VTM and 2007 Infrastructure Grading footprints were overlaid onto the mapped viola distribution for each year to determine viola impacts. The results are summarized below in Table V-2. The combined impacts range from an estimated low (in 2000) of 2.71 acres to an estimated high of 3.42 in 2004, with the average estimated impact of 3.05 acres. Viola coverage on the entire Northeast Ridge varied from 20.2 acres in 2004 to 31.4 acres in 2000, with a standard deviation of 4.65 acres. Based on this, the amount of viola impacted by development of the 2007 VTM and 2007 Infrastructure Grading (3.05 acres) is less than one standard deviation of viola acreage on the Northeast Ridge.

Table V-2. Estimated Viola Habitat Within the Development Area by Year

Impacts	2000 (ac)	2004 (ac)	2005 (ac)	Average (ac)
2007 VTM	1.97	2.65	2.2	2.27
2007 Infrastructure Grading	0.74	0.77	0.81	0.77
Total	2.71	3.42	3.01	3.05

Additionally, viola located within the temporary and permanent disturbance areas will be transplanted into suitable locations (e.g., in downslope areas with appropriate soils) within the grasslands of the Conserved Habitat. If these plants survive, it could increase the value of the

Conserved Habitat. However, because transplantation has occurred on a limited basis and has been successful in only a few instances, this analysis of the effect of the proposed development of 2007 VTM on the callippe assumes there are no beneficial effects resulting from the transplantation.

Although the 2007 VTM would avoid the high value hilltop and ovipositing habitats in Unit II-NI located in the 1989 VTM, it would result in impacts to downslope ovipositing habitat along the northerly boundary of Unit II-NII, which could affect the reproductive success of the species. The proposed temporary disturbance associated with the development would impact an area that is approximately 880 feet long and 100 to 200 feet wide, located on the south side of a ridgeline. This area is located approximately 100 feet south of Guadalupe Canyon Parkway (Figure 4). This ridgeline has been shown to consistently support callippe (TRA Annual Reports 2003-2005), as do hilltops and ridgeline areas to the north and east). The impact from grading on the south side of the ridgeline is anticipated to have a temporary impact because the topographic high point of the ridgeline will remain, and therefore continue to provide hilltopping habitat for callippe in the future. After grading, the area will be restored to grassland habitat.

Existing, protected hilltop and ridgeline habitat is present on the north side of Guadalupe Canyon Parkway, approximately 200 feet north of the project area, and on Callippe Hill on the Northeast Ridge approximately 100 feet east of the project area. Both of these adjacent sites provide important hilltopping habitat for callippe and would provide suitable hilltops for callippe butterflies that would be temporarily displaced by project grading activities.

Indirect impacts could also result from the development of the 2007 VTM, and include placement of a partial movement barrier between hilltopping and host plant areas, habitat fragmentation, and "edge" effects to the callippe and its host plant in adjacent Conserved Habitat due to increased activity in the area, including intrusion of residents and pets that will occupy the development and the introduction of non-native plant species that can invade and overtake grassland habitat.

Potential Movement Barriers: Butterfly dispersal can be influenced by the structural features of habitat: Barriers to callippe movement were investigated during the 1980-1981 San Bruno Mountain biological studies (TRA 1981). Urbanization of the Crocker Industrial Park (600 feet wide at its narrowest point) was assumed to be a total barrier, although callippe were found to travel between the Southeast Ridge and the Northeast Ridge. Callippes made this journey, by traveling either directly across the Industrial Park, or by moving through Conserved Habitat around the western perimeter of the Industrial Park. In the 1980-81 biological studies, dense clusters of tall trees, paved roads, and residential lots were identified as 'partial barriers', scattered trees and dense brush as 'minimal barriers', and cyclone fences, dirt roads and scattered brush as 'no barrier'.

The proposed development of the 2007 VTM would be located in an area that is currently dominated by both annual grassland and blue gum eucalyptus trees. Current and historical data show that callippe use the grassland habitat below the blue gum trees. The cluster of blue gum trees extends north to south through the project site and is approximately 25 to 350 feet wide. Callippe have been recorded passing through the blue gum trees in the narrow areas. However, in the widest areas, the cluster poses a potential partial barrier to callippe movement.

The proposed development of the 2007 VTM includes the construction of 88 homes within a permanent disturbance area of 16.67 acres. These homes will be two stories high, and the permanent disturbance footprint of the development range from approximately 50 to 1300 feet across. Temporary disturbance will temporarily add an additional 100 to 200 feet to the width of the project footprint, although these areas will not contain structures that could serve as a barrier to movement and are to be restored as part of the development process. The degree to which the development would be a barrier depends on callippe reaction to the height of the homes and width of the development, and the availability of movement corridors for the callippe around the development. Based on the availability of movement corridors around the development which callippes have been documented to utilize consistently over the span of the HCP (San Bruno Mountain Annual Reports 1982 – 2006), development of the 2007 VTM will not present a barrier to callippe movement. Passive dispersal across the proposed development may also occur. Prevailing winds in the area are generally west to east (TRA 2002) and callippe could fly more easily from west to east across the proposed development to the Conserved Habitat areas on the Northeast Ridge.

Callippes have been observed flying across Guadalupe Canyon Parkway during annual monitoring over the past 25 years, and this was documented during the 2006 monitoring season (Figure 8). The Parkway has Conserved Habitat on both sides: Saddle and Rio Verde parcels on the north, and the Northeast Ridge Water Tank Parcel and the Northeast Ridge on the south. After development of the 2007 VTM, the habitat along the southern side of the Parkway will range from approximately 87 feet to 250 feet in width. Habitat along the open space lands on the northern side of the Parkway will not be affected by the construction.

Habitat Fragmentation: As explained in Section IV, habitat fragmentation results from the division of habitat into small isolated patches. Habitat complexity tends to decline due to the loss of connected hilltops with variable lower elevation slope exposures, and habitat quality tends to decline due to edge effects from invasive weeds and a corresponding loss of host and nectar plant resources. Habitat fragmentation also decreases opportunities for genetic exchange among populations from dispersal of adult butterflies dispersing from one patch to another.

The proposed development is located within an area of high callippe usage. Although as discussed above the development of the 2007 VTM would reduce the size of the grassland habitat within the Northeast Ridge and could function as a partial barrier to callippe attempting to move through the development area, it would not fragment butterfly's habitat to the point where portions of the population are isolated from one another. Callippe would still be able to move around the development to the north of the development, and butterflies could also move through the band of habitat along either side of Guadalupe Canyon Parkway to access the high quality habitat hilltops of the Northeast Ridge. Butterflies on both sides of the development will still have access to hilltopping and viola habitat, and genetic exchange of populations of callippe within the Mountain will still occur (barring unforeseen circumstances not related to the 2007 VTM, such as impacts from climate change).

Increased activity in the area: Upon completion, the development of 2007 VTM would result in a permanent increase in human presence and activity within the Northeast Ridge. Because Unit II is an extension of the existing Unit I community, the project would not introduce humans into an area where they are not already present. Residents in the 71-unit development may use the

Conserved Habitat on the Northeast Ridge recreationally due to its close proximity. These users could impact callippe through straying off established trails and trampling viola and/or collecting butterflies with nets. Both activities could result in butterfly injury or death. Conversely, increased human presence of homeowners who are well informed and educated about the presence of callippe may benefit the species. Residents may provide additional eyes in the Northeast Ridge area and alert County or City of Brisbane officials of illegal and inappropriate use such as off-highway vehicle use. Additionally, increased human presence in itself may deter illegal or inappropriate activities on the Northeast Ridge that could otherwise harm or injure callippe.

In addition, fuel management zones surrounding portions of the developed area but within the Conserved Habitat will be subject to periodic management. These areas will not be irrigated, and management consists of removal of woody vegetation. Removal of woody vegetation would not be expected to harm or injure callippe, although impacts to viola in adjacent areas are possible. However, management activities are expected to be carried out through the Site Activity Permit process and under the guidance of the Habitat Manager. Overall, the removal of woody vegetation from this area and maintenance of the fuel management zones as grasslands are expected to be beneficial to callippe, since these activities protect and enhance the callippes' grassland habitat from brush succession.

Introduction of Non-native Species: A major threat to the butterflies on San Bruno Mountain is the invasion of their annual grassland habitat by non-native plant species. These species out-compete native host plants and thereby eliminate butterfly habitat. Soil disturbance, such as that associated with the proposed development activities, facilitates the invasion of areas by non-native species. Non-natives that are already present in the area may have a competitive advantage over native plants in dominating a temporarily disturbed area. In addition to non-natives already present, heavy equipment (bulldozers and other construction vehicles) could introduce new invasive species through seeds and plant materials that are lodged within tires or other parts of the vehicles. Landscaping associated with the development of the 2007 VTM could also introduce new non-native species to the area. Methods include seeds introduced from foot traffic or domestic pets, and plants that “escape” from residential areas. Although many of these plants do not survive or thrive in the areas to which they are introduced, some non-natives do and these plants could eventually displace or otherwise out-compete the plants upon which the callippe depend. For example, the low-growing viola is easily hidden by taller non-native annual grasses, which could make it difficult for females to locate viola for oviposition. Bermuda buttercup (*Oxalis pes-caprae*) is an invasive species that has recently become a more widespread threat on the Mountain due its ability to form dense carpets of rhizomes that outcompete all existing vegetation.

To minimize the threat of new invasive species being introduced the Mountain by the 2007 VTM, the following measures will be required: a) All construction vehicles operating on the Mountain will be washed to remove seeds and other plant materials prior to entering the work zone on the Northeast Ridge; b) all landscaping plants proposed for the Unit II- NII residential community will need to be approved by the San Bruno Mountain Habitat Manager, and c) deed restrictions for the Unit II-NII residential community will restrict planting of non-natives in areas adjacent to the Conserved Habitat.

Beneficial Effects of Conservation Measures: The operating program for the 2007 VTM, incorporates avoidance and minimization measures to reduce direct and indirect effects on callippe. These measures include avoidance of the hilltop habitat in Neighborhood I and in the area adjacent to Guadalupe Canyon Parkway; designing Neighborhood II to allow for continued callippe movement across Guadalupe Parkway between the Saddle area, Rio Verde parcel, Northeast Ridge Water Tank parcel and the Northeast Ridge; removal of eucalyptus trees to eliminate a partial barrier to callippe movement; restoration of temporarily disturbed areas with native grassland species, including the area between development and Guadalupe Canyon Parkway; use of topsoil collected from impact areas as part of the restoration program; transplantation of viola from areas to be disturbed to the restoration area; removal of all non-native plants from the project area prior to grading so that seed is not incorporated into soil; education of future residents through home buying process or home owners association materials about the endangered butterflies to reduce impacts from increased activity in the area; washing of construction vehicles to remove seeds and other plant materials prior to entering the work zone on the Northeast Ridge; a requirement for approval by the Habitat Manager for all landscaping plants proposed for the Unit II- NII residential community; and a requirement for deed restrictions to limit the use of non-native invasives for landscaping adjacent to the Conserved Habitat.

Unavoidable impacts would be offset by the conservation measures incorporated into the project, including the proposed dedication of 78.27 acres of Conserved Habitat and restoration of 2.97 acres of temporarily disturbed areas. In addition, as described above, development of the 2007 VTM will significantly increase the funds available for habitat management and monitoring by increasing the annual charge for residential units to \$800 (2005 dollars) and by establishing a \$4,000,000 endowment. The combined sum of the 2007 VTM proposal would increase the HCP annual revenues utilized for habitat management by approximately \$275,000 per year (2007 dollars). Current (2007) HCP revenues for habitat management and monitoring are approximately \$130,000 per year. These funds will be used to manage and monitor callippe habitat throughout the Mountain, the effects of which are examined in more detail in the following section. The additional management funded by the development of the 2007 VTM would provide funding to support ongoing grazing and brush removal experiments and invasive species control to protect and restore grassland butterfly habitat on a much more thorough scale than is possible under the current management budget. This funding would be used to address coastal scrub succession which has caused the loss of approximately 122 acres of grasslands within Conserved Habitat over the span of the HCP (23 years; 1982-2004; San Bruno Mountain Habitat Management Plan, 2007). Clearing coastal scrub from former grassland areas and controlling invasive weeds will allow for natural recruitment of viola into reclaimed grassland areas. In the vicinity of the Northeast Ridge the funds will allow for the management of the habitat corridors on both sides of Guadalupe Canyon Parkway and the area around the water tank, including the removal of coastal scrub and non-native species that are currently encroaching on grassland habitat. Specific parcels that would directly benefit from this work include parcels that have shown a significant decline in callippe occupancy over the span of the HCP, including the Rio Verde parcels, the Northeast Ridge Water Tank Parcel, and the McKesson parcel. Coastal scrub succession and to a lesser extent, invasive weed infestation, has replaced the grassland habitat for callippe in these areas. The revised operating plan for the Northeast Ridge also requires the developer, Brookfield Northeast Ridge II LLC, to fund the management of the 78.27 acres of proposed Conserved Habitat within the Northeast Ridge prior

to dedication of this parcel to the State and County Park. This allows the HCP Trustees to collect the annual HCP fees and build up the endowment prior to taking over management responsibilities.

Estimated Level of Take

Incidental take of individual butterflies is difficult to quantify for the following reasons: the small size and delicate nature of the eggs and larvae, the cryptic coloration of the larvae, and the behavioral tendency of the larvae to remain hidden with the thatch layer below the base of their host plants. Losses are also likely to be masked by seasonal fluctuations in numbers of the species. All of these factors make the detecting of dead specimens extremely unlikely. Because incidental take is expected to be almost undetectable, the number of individual callippe butterflies likely to be taken as a result of the development of the 2007 VTM cannot be predicted. However, take can be inferred from the amount of callippe habitat (viola within grassland) impacted. The maximum level of take that would occur under the 2007 VTM is 2.27 acres of viola. An estimated 0.77 acres of viola were impacted by the 2007 Infrastructure Grading.

Viola habitat outside of the development footprint for the 2007 VTM could be subject to indirect impacts associated with the development and from habitat maintenance and enhancement activities, but take would be reduced through the use of minimization and avoidance measures described above and in the HCP. Incidental take of callippe would occur under both the 1989 and 2007 VTMs; however, the 2007 VTM would reduce take by approximately 62 percent compared to the 1989 VTM due to the reduction of viola habitat loss.

2. Management and Monitoring of Conserved Habitat

Preservation and management of existing habitat and monitoring of the Mountain's butterfly populations have been the primary conservation methods since the HCP was adopted.

a. Management

Vegetation management techniques included in the HMP are intended to reduce or eliminate invasive plant infestations, reduce thatch and dense annual grasses, and reduce the cover of coastal scrub. The techniques include hand removal, herbicide application, livestock grazing, prescribed burning (when permissible), pile burning, mowing, mechanical clearing, and replanting/restoration.

Impacts to listed species other than callippe resulting from these activities are currently authorized under the HCP and are carried out in areas where they will not result in take of the callippe. Management in areas containing callippe is carried out using manual techniques, including hand removal and herbicide application. These methods are labor and time intensive, which limits the extent of Conserved Habitat that can be managed with available funding. Amending the ITP to authorize incidental take related to management activities will allow for broader use of more efficient management techniques, including mowing, grazing, and burning. These activities will allow for more grassland habitat to be managed using techniques that mimic the natural conditions (i.e., episodic disturbance from fire and grazing) that shaped the

composition of the grasslands on San Bruno Mountain (San Bruno Mountain Habitat Management Plan 2007).

Over the past twenty-five years (1982-2007), the primary methods for invasive species control on San Bruno Mountain have been herbicide treatment, hand removal, mowing, and mechanical clearing. Grazing and burning have been used to a lesser extent and mostly on an experimental basis. However it is now generally understood that grazing and fire play an integral part in maintaining grasslands and their removal or suppression can have negative effects on grassland ecosystems such as San Bruno Mountain (Edwards, 1992; Anderson, 2006). Due to the potential take of callippe associated with grazing and burning, these activities cannot currently be carried out in areas with callippe habitat, and no grazing or burning has been conducted within callippe habitat since the species was listed in 1997. Their usage would likely increase with the expanded funding provided by the Amendments. Take authorization for the callippe would allow their use within areas occupied or suitable for the callippe.

The potential effects of specific vegetation management techniques on the callippe are provided below.

(1) Hand Work

Description. Hand removal of invasive plants is an effective method for eliminating clusters of invasive plants, especially seedlings and plants whose root structure is not prohibitively deep or large. Hand removal involves identifying the target species and then sending crews out to either pull plants out of the ground, use a weed wrench to remove bigger plants, or cut down plants with an ax maddox or chain saw. The plants removed are piled up and either manually removed, burned or allowed to decompose over time.

Impact. Non-selective or unsupervised hand work could result in injuries to listed butterflies, including eggs and larvae, or destruction of host plants. However, hand work is done in a manner that avoids disturbance to any host plants of the endangered butterflies.

Measures. Prior to conducting hand work in a specified area, the Habitat Manager surveys the target area for presence of butterfly host plants. Crews working under the Habitat Manager are trained in the identification of butterfly host plants, and know to avoid them. For crews working on the Mountain that are not knowledgeable in host plant identification, such as CDF prison crews, any areas that contain host plants must be flagged and crews monitored by the Habitat Manager so that host plant are avoided.

(2) Herbicide

Description. Herbicide control is typically used on mature, dense stands of invasive plants that are more cost effective to spray than remove by hand. Most invasive pest plant infestations treated with herbicide are treated 2 to 3 times per year by foliar spraying. Spraying can be done year-round with the same results on certain species, while treatment must be done within a certain season for others (e.g., early spring for fennel). The initial treatment typically has a 95% kill rate followed up with routine maintenance every six to twelve months for up to three years until the infestation is killed. Ongoing maintenance and monitoring is required after three years.

Impact. Non-selective or unsupervised herbicide application could result in injuries to listed butterflies, including eggs and larvae, or destruction of host plants. However, herbicide application is done in a manner that avoids disturbance to any host plants of the endangered butterflies.

Measures. Prior to conducting herbicide work in a specified area, the Habitat Manager surveys the target area for presence of butterfly host plants. Crews conducting herbicide control work under the Habitat Manager are trained in the identification of butterfly host plants, and know to avoid them. By law, herbicide spraying is restricted to periods with low winds to avoid drift to non-target species. A backpack sprayer is used in areas with sensitive species rather than the truck mounted spray rig to better target the invasive species. No aerial spraying is conducted on San Bruno Mountain.

(3) Grazing

Description. Grazing has yet to be used on a large scale on San Bruno Mountain for habitat enhancement purposes. Though grazing was recommended as an important tool to utilize on the Mountain in the San Bruno Mountain HCP, grazing as a land management tool has not been implemented or tested on a significant scale. This is largely due to a lack of infrastructure to support grazing (i.e. fencing, water system), and a lack of funding to support grazing experiments and research on the Mountain. Ecological damage as a result of grazing is typically associated with overgrazing and/or grazing within riparian wetland habitats, due to a single-minded approach of raising cattle for meat and dairy production without consideration of environmental impacts.

Depending upon a variety of factors, grazing can have a positive (encourage more natives) or negative (stimulate more invasives and erosion) impact upon a landscape. The number of animals, type of animals, duration and frequency of grazing events, and vegetation type are all variables that will influence the results of grazing. In some cases, the right combination will need to be determined through experimentation, and target goals and limitations need to be well understood. It should be expected that a significant improvement in the landscape from grazing may take at least 2 to 4 years (San Bruno Mountain Habitat Conservation Plan, 2007). In some situations, where the native seed bank has been depleted from years of poor land management, re-introduction of native plant species may be necessary.

Research at the Kirby Canyon Land Trust in Santa Clara County has indicated that cattle grazing in the early spring is beneficial to the native grassland habitat of the federally threatened bay checkerspot butterfly (*Ephydra editha bayensis*). The native bunchgrasses are less palatable at this time, and their deep root structure is an adaptation to rebound after being grazed. Over time, a consistent practice of grazing in the early spring has resulted in a reduction of weedy annual grasses and herbs and the perpetuation of native grasses and native annual and perennial wildflowers, including the host and nectar plants of the bay checkerspot butterfly (pers. comm. Stewart Weiss). Furthermore, the removal of grazing and the resultant proliferation of invasive weeds have been shown to eliminate important butterfly habitat areas at Kirby Canyon.

Atmospheric deposition of nitrogen from cars and industrial sources has been documented to accelerate weed invasions of grasslands in the San Francisco Bay area and elsewhere, and both

grazing and mowing have been shown to successfully counteract this process (Weiss, S.B. 1998; 2006). Edgewood County Park in San Mateo County has recently implemented a program of repeated mowing in order to reduce invasive weeds in the Park and enhance habitat for the bay checkerspot butterfly. The species was re-introduced to the Park in 2007.

Impact. Grazing as a management tool for butterflies must be carefully assessed and monitored for each butterfly species. Grazing impacts include trampling of host plants and incidental predation from livestock. There appears to be a greater tolerance for certain schedules and intensities of livestock grazing where populations of butterflies are relatively high (USFWS, 1997). Some species of butterflies, especially grassland species, have habitat requirements that need a managed grazing scheme whereas others primarily utilize habitats that require minimal or no grazing (e.g. riparian wetlands, coastal scrub, oak woodlands, etc.). Due to the variable microclimates and slope exposures on San Bruno Mountain, it is likely that grazing will need to be applied differently depending upon aspect, soil moisture, plant community, and extent of butterfly habitat. In most areas of the Mountain, it is likely that grazing would have a beneficial impact on the butterflies of concern through opening up grassland habitat that would otherwise be degraded by thatch build up, invasive species, and/or coastal scrub succession. Careful monitoring and invasive species control before and after grazing treatments using hand, herbicide, mowing, and potentially burning, will also likely be critical towards the successful application of grazing.

It is estimated that implementation of a stewardship grazing program could impact a maximum of 200 acres per year (approximately 15% of the grassland area on the Mountain). Approximately 133 acres of viola habitat is currently located within the grasslands on San Bruno Mountain. Viola habitat is spread out over the Mountain, and grazing could impact approximately 15% of the callippe's viola habitat. Grazing would result in direct taking of some callippe larvae and host plant habitat, however this take is likely to be minimal in comparison to the expected overall benefit to callippe through the stimulation of new viola growth and the restoration of habitat areas currently degraded by excessive thatch, annual invasive grasses and weeds, and native coastal scrub.

Measures. Implement a grazing program on a small scale and at low intensities to determine the overall benefit of the grazing on the endangered butterflies. Areas selected for grazing should be degraded with invasive species, coastal scrub, or heavy thatch such that host plants are already scarce and the benefits of grazing are high. Management of grazing areas should include post-grazing monitoring of invasive species, and invasive species control using hand removal, herbicide, and/or mowing. Grazing would first be implemented on a small scale (50 - 100-acre sized plots) to determine the impact on callippe habitat, before being applied on a larger scale basis (i.e., up to 200 acres per year).

(4) Prescribed Burning

Description. Prescribed burning would be done under the direction of the California Department of Forestry (CDF) with guidance from the Habitat Manager, and implementation would require the assistance of CDF, the County of San Mateo, and local fire departments. Historically, fire played a major role in maintaining California grasslands occupied by the callippe (Heady 1988) and mission blue butterfly. It seems likely that these two species have behavioral and biological

adaptations to cope with fire, and that their populations can be maintained in a landscape with occasional grassland fires. However, if a hot, slow fire moves through grassland when eggs, larvae, or pupae are present, it likely kills them. If fire occurs during the summer flight period of the callippe or the spring flight period of the mission blue butterfly, most adults present will likely avoid death by flying away from the fire. After the fire is out, and the grassland has cooled down, adults are likely to return to the burned areas in search of host plants and nectar plants. This behavior was observed in the regal silverspot (*Speyeria idalia*) (Huebschman and Bragg 2000). Grassland wildfires in the past on San Bruno Mountain have typically burned less than 50 acres per year, partly due to fire suppression activities by CDF and local fire agencies (San Bruno Mountain Habitat Management Plan 2007). At present, it may be difficult to conduct control burns on San Bruno Mountain due to the need to first provide adequate fuel buffer zones between habitat areas and populated areas through reduction of native and non-native brush.

On a longer time scale, a mosaic of fire in a large habitat area could be beneficial if it retards shrub invasion or otherwise promotes host plant growth. Experimental burning within habitat for the Oregon silverspot butterfly (*Speyeria zerene hippolyta*) at Cascades Head, resulted in an over six-fold increase in *Viola adunca* seedlings post-fire (The Nature Conservancy, 1998). Observations of post-wildfire increases of *Viola pedunculata*, *Lupinus albifrons* var. *collinus*, and *Lupinus formosus* var. *formosus* on San Bruno Mountain by the Habitat Manager suggest that the callippe and mission blue host plants also have a very positive response to fire. Because there appear to be potential benefits of fire to the callippe's habitat, this management tool needs to be considered and tested.

In applying fire as a management tool, the direct and indirect impacts from fire need to be considered. At one midwestern United States site, the abundance of the regal silverspot was reduced for a period of 3 to 5 years following the application of fire due to the direct impacts on larvae food plants and adult nectar sources (Swengel 1996). Fire can also indirectly cause the elimination of butterfly habitat through stimulating weed invasions. A wildfire that occurred on the summit of San Bruno Mountain in 1984 burned through a significant portion of the habitat of the bay checkerspot butterfly precipitating an invasion of filaree (*Erodium ssp.*), and consequently the bay checkerspot has not been detected on San Bruno Mountain since 1985 (San Bruno Mountain Annual Report, 1986).

Impact. Spring burning too close to the time of adult butterfly emergence could delay flowering of host plants and result in the absence of blossoms and seeds when needed. Burning to maintain the open grasslands for the mission blue and callippe could be detrimental to the host plants and may also harm unprotected eggs or larvae if not done at the proper time.

In accordance with the HMP, controlled burning would first be implemented on a small scale (50- to 100-acre plots) to determine the impact on callippe habitat, before being applied on a larger scale. Controlled burning would likely result in take of some callippe larvae and would destroy host plant habitat. However, this extent of take is likely to be minimal, and the expected overall benefit to species—through the stimulation of new viola growth and the restoration of habitat areas currently degraded by excessive thatch, annual invasive grasses and weeds, and native coastal scrub—is expected to be large. Historically uncontrolled wildfires burned on the Mountain on an annual basis. Within the past few decades, the size of these wildfires has likely

decreased (to typically less than 50 acres or less on an annual basis) due to fire suppression activities. Viola and callippe presence has been stable over time on San Bruno Mountain, except within lower elevation grasslands that have converted to coastal scrub vegetation (approximately 122 acres). It is likely that the lack of burning on the Mountain has contributed to this conversion to coastal scrub and resultant decline of callippe presence (San Bruno Mountain Habitat Management Plan 2007).

Timing considerations are very important for burn management to avoid impacts on the butterflies. Prescribed burns conducted during the fire season (summer and early fall) would have a beneficial impact on the native flora and butterfly habitat, because the plant community is adapted to summer/fall burning. In contrast, prescribed burns conducted after the fire season would be more manageable to control and would have adequate CDF staff on hand to assist. However, burning at this time of year may have detrimental, rather than beneficial impacts on the grassland plant community and the butterfly habitat.

Measures. Though late fall or winter prescribed burns would have better chances of receiving burn permits from the air quality district as the air is generally cleaner in the fall and winter months, prescribed burning should only be conducted at this time if ecological conditions are determined to be appropriate for burning by the Habitat Manager. Prior to conducting any burns, a burn plan must be prepared and approved by CDF and the Habitat Manager. The San Bruno Mountain Community Wildfire Protection and Fire Use Plan (CDF, 2005) provides a streamlined process for implementation of burns on San Bruno Mountain within designated areas. However, currently the lack of fire buffers between populated areas and high fuel vegetation types (invasive and native brush and woodlands) diminishes the ability to safely implement controlled burns on San Bruno Mountain. Through grazing, mowing and/or pile burning to create adequate fire buffers, it is more likely that controlled burning could be conducted.

(5) Pile Burning

Description. Pile or slash burning is an integral part of the management program. This tool is important for reducing the accumulation of brush (wildfire fuels), and for decreasing native scrub and invasive species coverage. Pile burning can be conducted safely during the winter months when the surrounding vegetation is wet (and fuel moisture levels are high and the risk of fire escape is negligible). Combined with mowing and/or grazing, it is an excellent tool for opening up areas for conversion to grassland and for preparing areas for replanting. Post disturbance follow-up weed control is critically important to control the flush of weeds that may occur in areas following clearing and pile burning activities.

Impact. Pile burning would be done in conjunction with hand work, mowing and/or herbicide control and would be done in a manner that avoids disturbance to any host plants of the endangered butterflies.

Measures. Prior to piling vegetation for burning in a specified area, the Habitat Manager surveys the target area for presence of butterfly host plants. Any areas that contain host plants are flagged so that crews can avoid disturbing those plants while the pile burning takes place. Pile burning would require assistance from CDF and/or other local fire departments, supervision of work crews by the Habitat Manager, and a permit from the BAAQMD. Prior to conducting any

pile burns, a burn plan must be prepared and approved by CDF and the Habitat Manager. The San Bruno Mountain Community Wildfire Protection and Fire Use Plan (CDF, 2005) provides a streamlined process for implementation of pile burns on San Bruno Mountain within designated areas.

(6) Mowing

Description. Mowing can be used to depress woody and weedy invasive species in the same manner as grazing and burning. Since mowing can be selectively implemented to avoid sensitive habitat, it is a valuable technique that can be implemented within highly sensitive habitat areas. Mowing during the spring before annual grasses and herbaceous weeds have had a chance to out compete native species is a technique that has shown to be successful within mission blue habitat restoration islands along Guadalupe Canyon Parkway, and at the Southeast Ridge (Preservation Parcel). Mowing has not been applied on a large scale to suppress annual grasses and herbaceous weeds due to the high cost of implementation of this technique on a Mountain-wide scale. Mowing can be done with a tractor mower for large areas, or with a weed-eater for small areas.

Impact. Non-selective mowing to maintain the open grasslands for the mission blue and callippe could be detrimental to the butterflies' host plants and may also harm unprotected eggs or larvae. Selective mowing is useful for managing highly sensitive butterfly habitat areas, without damaging butterfly host and nectar plants. On San Bruno Mountain, mowing conducted in this manner results in insignificant impacts to the endangered species.

Measures. Prior to conducting mowing work in a specified area, the Habitat Manager surveys the target area for presence of butterfly host plants. Crews conducting mowing work under the Habitat Manager are trained in the identification of butterfly host plants, and know to avoid them. Whenever crews are unfamiliar with the native plant species and the endangered species host plants, all butterfly host plants in the area will be flagged and crews will be closely monitored during operations.

(7) Mechanical Clearing

Description. Clearing of unwanted brush and trees, such as broom, gorse, coyote brush, Monterey pine and eucalyptus may be accomplished by a variety of means. Private contractors, the California Conservation Corps, County Fire Safe crews, and CDF prison crews have been used for brush clearing projects on the Mountain. Mechanical methods for brush and tree removal may also successfully meet management goals, but generally at a higher cost. A Brontosaurus (a large cutting head mounted on a tracked caterpillar) can effectively remove brush where hand removal or grazing is not feasible. The Brontosaurus removes and chips brush and small trees in a single operation.

Impact: Non-selective mechanized clearing could be detrimental to the host plants for the callippe and other listed butterflies and may also harm unprotected eggs or larvae. Mechanized clearing in selective areas to minimize and avoid impacts on the butterflies. The HMP calls for selective mechanized clearing mowing to be conducted in this manner and should result in insignificant impacts to endangered species.

Measures: Prior to conducting mechanical clearing in a specified area, the Habitat Manager surveys the area for presence of butterfly host plants. All butterfly host plants in the area will be flagged, and crews will be closely monitored by the Habitat Manager during operations. Crews conducting mechanized clearing are trained by the Habitat Manager to identify and avoid butterfly host plants.

(8) Replanting/Restoration

Description. While much greater effort and expense has gone toward habitat maintenance and enhancement on San Bruno Mountain, replanting has been used with success when areas have been properly selected and when thorough follow up work has been done to protect plantings. Smaller habitat islands, approximately 1 acre or less, are managed more easily and can provide habitat for the endangered species once plants are established and maintained for a few years (SBM Annual Reports; 2002 – 2006). Successful habitat islands have thus been created within HCP Conserved Habitat as well as on development slopes.

Impact. Replanting is done in a manner that avoids disturbance to any host plants of the endangered butterflies, therefore the impact is insignificant.

Measures. Prior to conducting replanting/restoration in a specified area, the operator surveys the target area for presence of butterfly host plants. Any areas that contain host plants are flagged so that crews can avoid disturbing the plants.

Estimated Level of Take

Due to the Habitat Manager's ability to target specific invasive species using hand work, herbicide application, mechanical clearing, and mowing, there has been no significant adverse effects to the endangered butterflies (mission blue, callippe and san Bruno elfin) or their habitats on the Mountain from the use of these techniques. No take of callippe or other listed butterflies is known to have occurred from past pile burning or replanting/restoration activities. No take is expected with the continued application of any of these methods.

It is more difficult to target only invasive species when applying grazing and prescribed burning techniques, prescribed burning and grazing management activities may result in both lethal and non-lethal take to butterflies within areas being managed. However, the overall impact of grazing and/or prescribed burning has been demonstrated to have a significant beneficial effect on the butterflies' habitat when applied appropriately. The number of individual butterflies and plants likely to be impacted is small in comparison to the Mountain's population and should be offset by the beneficial effects such activities have on the population as a whole.

Incidental take of individual butterflies from grazing and/or burning activities is difficult to quantify. The impact of management activities can be estimated based on the amount of habitat area with viola that would be grazed and/or burned on an annual basis, and the expected benefits from this activity. Grazing and/or burning would have short-term temporary impacts on viola and callippe larvae through the trampling and burning of host plants and larvae. These impacts would likely be more than offset by the beneficial impact of these activities through the removal of thatch and brush that eliminate viola habitat. As stated in the HMP, grazing and burning would not be applied on a large scale on San Bruno Mountain until it has been established that

these activities are viable tools to increase both the quality and quantity of habitat for callippe. It is estimated that grazing and burning would be applied to a maximum of 200 acres of grassland habitat per year during the experimental testing phase. This would correspond to a maximum of 15% of callippe habitat. Take of callippe associated with grazing would likely be less as cattle would not impact all of the viola within a grazing treatment area. In addition, in managing the grasslands for callippe, cattle would be taken off the land in the early spring to allow the callippe's host and nectar plants to rebound. Similarly burning would not impact all callippe larvae, and it is expected that the species can survive within small-unburned patches, and recolonize burned areas from adjacent habitats. Based on this, the maximum expected take from grazing and burning operations would be 15% of the grassland habitat (200 acres). This estimate of take is hypothetical however and is based on a worst-case scenario that assumes that burning and grazing would be implemented in a destructive, rather than ecologically sensitive manner. It is now well documented that take of mission blue and callippe is occurring on San Bruno Mountain due to a lack of burning and grazing, as part of a comprehensive management program to control the expansion of coastal scrub vegetation. Although the extent of grazing and burning likely to occur on an annual basis would not be known until the specifics of a comprehensive burning and grazing program are determined, it is estimated that no more than 50% (approximately 600 acres) of the Mountain's grassland habitat would be grazed and/or burned each year once the program is put into operation. If the beneficial impacts from grazing and/or burning are realized, it is expected that minor viola impacts from burning and grazing would be offset by a substantial increase in viola acreage.

b. Monitoring

Compliance monitoring, including supervision of work crews and construction monitoring, will not result in adverse effects on the Mountain's listed species because it does not involve habitat modification or any other activities that could affect the Mountain's butterflies.

The monitoring techniques described in the HMP include: endangered butterfly monitoring (monitoring of population status, including status of habitat); monitoring of additional species (including bumblebees, which are needed to propagate host and nectar plants, and non-native ants, which could harm habitat); rare plant mapping; and habitat management effectiveness monitoring (including assessing the effectiveness of research and pilot study programs and Conserved Habitat enhancement programs).

All of the existing and anticipated butterfly monitoring programs anticipated under the HCP and HMP consist of walking through butterfly habitat. Impacts to individual callippes and other listed butterflies would not be expected, but walking through grassland habitat could result in minimal habitat modification due to trampling of host and nectar plants, which could also result in impacts to eggs or larvae of listed butterflies. Future surveys may also employ mark and recapture techniques, if deemed appropriate by the HCP Plan Operator. These activities could result in harm or harassment of individual butterflies.

Monitoring of additional species consists of assessments of population status and distribution across the Mountain, which will be conducted by walking through grassland habitat. Impacts would be similar to those expected from endangered butterfly monitoring.

Rare plant monitoring involves mapping changes to the distribution of rare plant species across the Mountain. Rare plant distribution data is collected by walking through grassland habitat, recording data about the location, quantity, and health of individual rare plants and plant colonies. Impacts would be similar to those expected from endangered butterfly monitoring.

Habitat monitoring is designed for use in conjunction with species monitoring so that the effects of habitat management techniques can be related to habitat changes and response of the species. It will include monitoring of butterfly host and nectar plants as well as invasive species that pose emerging threats to butterfly habitat. Monitoring of habitat may result in trampling or destruction of host and nectar plants, and could also result in impacts to eggs or larvae of listed butterflies.

Data collected from the monitoring is used to establish priorities or recommend changes to the management activities being undertaken.

Estimated Level of Take

Monitoring activities may result in both lethal and non-lethal take to butterflies, including impacts to the callippe host and nectar plants. The number of individual butterflies and plants likely to be affected are small in comparison to the Mountain's population and should be offset by the beneficial effects such activities have to population as a whole. This impact would occur from monitors walking through the habitat areas. Since monitors are knowledgeable in the identification of the butterfly host and nectar plants, travel along established trails, and can easily avoid stepping on host plants, the anticipated take is extremely small, collectively less than 0.1 acres annually.

C. Impacts to Other Covered Species and Sensitive Habitats

Special status reptiles and amphibians with potential to occur on the Mountain include the San Francisco garter snake and California red-legged frog. Historical occurrences (prior to the early 1970s) of the San Francisco garter snake and California red-legged frog were reported on San Bruno Mountain. Focused surveys in the 1980s and early 1990s for these species were conducted, but neither species was detected. There have been no recorded observations of California red-legged frogs or San Francisco garter snakes on San Bruno Mountain during the 25-year span of the HCP (San Bruno Mountain HCP Annual Activities Reports, 1982 to 2006). These species were likely extirpated from the Mountain when more extensive freshwater marsh and riparian wetland habitats associated with lower Colma Creek and lower Wax Myrtle Ravine were present on the Mountain. These areas were destroyed by road building and urbanization in the 1960s, prior to the formation of the Habitat Conservation Plan in 1982. The Northeast Ridge has a predominately a south-facing exposure, that is dominated by dry grassland vegetation, and does not support any wetland features that could support the San Francisco garter snake or California red-legged frog. Due to the lack of significant wetland habitats on San Bruno Mountain, there would be no impact to either species from development of the 2007 VTM or from ongoing habitat management and monitoring. Impacts to the listed butterfly species are described below.

1. Urban Development within Northeast Ridge

a. Mission Blue

Take of the mission blue butterfly and its habitat would be similar to that described for callippe since mission blue also requires grassland habitat. Development authorized by the Northeast Ridge Amendment and the 2007 Infrastructure Grading would result in the loss of 12.01 acres of grassland habitat which supports the mission blue. Approximately 2.97 acres would be temporarily disturbed and restored.

Mission blue presence corresponds to areas where the butterfly's larval food plant is located. Impact on the species can result from direct loss of larval host plant habitat. Potential indirect impacts include habitat fragmentation, movement barriers, the introduction of non-native plants, and lack of management to control brush succession. Take could occur through direct loss of individuals during construction activities or human activities once the development is occupied.

Mission blue will benefit from the \$4 million endowment since it will provide a critical supplement to existing funding levels for San Bruno Mountain management and ensure that mission blue habitat enhancement through control of non-natives and coastal scrub expansion is well funded.

Loss of Lupine Habitat. The current 2007 VTM has been revised from that approved by the 1989 Equivalent Exchange Amendment for the Northeast Ridge. The 2007 proposal represents a decrease in the total area of development and an overall decrease in loss of grassland habitat. In the absence of lupine distribution data, mission blue habitat loss is estimated based on grassland habitat loss. The 2007 VTM will result in the loss of approximately 12.01 acres of grassland habitat that supports patches of lupine plants. This represents a loss of 9.7% of the grassland on the Northeast Ridge and 0.93% of the grassland habitat on San Bruno Mountain as a whole. The 1989 VTM would have impacted 29.31 acres of grassland habitat that supported mission blue, while the 2007 VTM would impact 12.01 acres. In summary, the 2007 VTM represents a 59% reduction in impacts to mission blue habitat on the Northeast Ridge than what was approved under the HCP. The loss of grassland habitat is partially offset by the restoration of grassland within the temporarily disturbed areas. Unlike viola, the mission blue's host plant (lupine) can be effectively restored through replanting and habitat maintenance (San Bruno Mountain Habitat Management Plan 2007).

Indirect impacts from movement barriers and habitat fragmentation are similar to those discussed for the callippe, and are offset by the establishment of Conserved Habitat through the HCP on surrounding parcels.

Estimated Level of Take

Incidental take of individual butterflies is difficult to quantify for the following reasons: the small size and delicate nature of the eggs and larvae, the cryptic coloration of the larvae, and the behavioral tendency of the larvae to remain hidden with the thatch layer below the base of their host plants. All of these factors make the detecting of dead specimens extremely unlikely. Losses are also likely to be masked by seasonal fluctuations in numbers of the species. As a result it cannot be predicted how many individual mission blue will be taken and incidental take

is expected to be almost undetectable. Therefore take is inferred based on the amount of mission blue habitat impacted. The maximum level of take that would occur under the 2007 VTM is 12.01 acres of mission blue grassland habitat. Impacts would be offset by the conservation measures discussed above, including dedication and management of Conserved Habitat within the Northeast Ridge, additional management throughout the Mountain allowed by supplemental funding, and restoration of temporarily disturbed areas. In addition, mission blue habitat outside of the development footprint of 2007 VTM would be subject to habitat maintenance and enhancement activities, but take would be reduced through the use of minimization and avoidance measures. Incidental take of mission blue would occur under both the 1989 and 2007 VTMs; however, the 2007 VTM would reduce take by approximately 59% due to the reduction of habitat loss.

b. Bay Checkerspot Butterfly and its Critical Habitat

The bay checkerspot butterfly's habitat also occurs in grasslands. If present, development activities would impact the bay checkerspot in a manner similar to that described for the callippe. However, this butterfly has not been observed on the Mountain since the mid 1980s and is believed to be extirpated. There is no historical information documenting its occurrence within the Northeast Ridge Parcel. Therefore no direct or indirect effects to this species are anticipated from the development of the 2007 VTM. The Northeast Ridge project is not located within the species' designated critical habitat, and construction of the 2007 VTM would not impact the bay checkerspot's designated critical habitat.

c. San Bruno Elfin

The HCP does not authorize take of the San Bruno elfin butterfly for development activities, and the development of 2007 VTM would not result in take of the elfin. All known populations of the San Bruno elfin on the Mountain are located on Radio Ridge and along the Southeast Ridge. The Northeast Ridge does not support the host plant of the San Bruno elfin butterfly (*Sedum spathulifolium*). Development of the Northeast Ridge would impact 12.01 acres of grassland, and would not directly or indirectly affect the San Bruno elfin.

2. Management and Monitoring of Conserved Habitat

a. Mission Blue

Impacts to mission blue will be similar to the impacts of management activities on the callippe described above in Section V.B.2. Overall, management and monitoring would be expected to have a net beneficial effect on the mission blue butterfly.

b. Bay Checkerspot Butterfly and its Critical Habitat

The bay checkerspot has not been observed on the Mountain for approximately two decades. The lack of sufficient habitat to support the species (the species was limited to a narrow strip of land on the summit of San Bruno Mountain) and the occurrence of a wildfire in the Mountain's limited habitat in the mid-1980s are believed to have extirpated the species. No impacts from management and monitoring are expected. If the species is reintroduced to the Mountain, impacts from management and monitoring activities would be similar to those described for the

callippe. Overall, management and monitoring would be expected to have a net beneficial effect on the bay checkerspot butterfly, should it be reintroduced on the Mountain in the future.

USFWS designated 748 acres of critical habitat for the bay checkerspot on San Bruno Mountain in 2001. Bay checkerspot critical habitat on San Bruno Mountain is located mostly within the State and County Park above the 500-foot elevation contour and would be managed and maintained under the HCP. Bay checkerspot critical habitat would benefit from the expanded management work afforded by the Amendments. At present, bay checkerspot habitat is still present within grasslands on the Mountain. The species requires the presence of its primary host plant dwarf plantain (*Plantago erecta*), along with two secondary host plants owl's clover (*Castilleja densiflora*), and purple owl's clover (*Castilleja exserta*). Threats to the species' grassland habitat and host plants include invasive species and brush succession. The expansion of weeds such as Bermuda buttercup (*Oxalis pes caprae*) and filarees (*Erodium ssp.*) as a result of fires, and addition of soil nitrogen from atmospheric deposition can eliminate the species host plants. Cattle grazing has effectively improved and maintained this species habitat at the Kirby Canyon Land Trust in Santa Clara County for over 20 years. Habitat management that included cattle grazing would improve the quality of bay checkerspot habitat on San Bruno Mountain.

c. San Bruno Elfin

Impacts to the San Bruno elfin butterfly will be similar to the impacts of management activities on the callippe described above in Section V.B.2. Overall, management and monitoring would be expected to have a net beneficial effect on the San Bruno elfin butterfly.

VI. Findings

A. Amendment for Equivalent Exchange of Conserved Habitat within Northeast Ridge

The Amendments will provide new Conserved Habitat that is superior in biological value and larger in size than the habitat that will be lost.

- The revised operating plan for the Northeast Ridge based on the 2007 VTM results in a net increase in Conserved Habitat of 8.93 acres. It also decreases temporary disturbances within Conserved Habitat by 11.43 acres, so that the total reduction in disturbed area is 20.36 acres.
- The new Conserved Habitat is higher in biological value because the 2007 VTM avoids impacts in a hilltop area that is important for callippe mating. Avoiding impacts to this area and reconfiguring the development adjacent to Guadalupe Canyon Parkway decreases indirect effects on the callippe, including habitat fragmentation.
- The 2007 VTM results in an increase in the amount of grassland and specifically viola, the host plant for the callippe, within the Conserved Habitat by reducing temporary and permanent disturbances of callippe habitat by approximately 62 percent. As noted above, permanent impacts are reduced by 8.93 acres. Temporary disturbances are reduced by 11.43 acres. Reducing temporary impacts is significant because it avoids impacts to viola, which has proven difficult to restore from seed.

B. Other Proposed Amendments

The other changes to the HCP proposed by the Amendments do not conflict with the primary purpose of the HCP to provide for the indefinite, long-term perpetuation of the mission blue and callippe and other species of concern.

- Impacts to callippe and other listed butterfly species from the development within the Northeast Ridge are minimal (approximately 2.27 acres of viola habitat), are significantly reduced in 2007 VTM compared to the previously approved development plan, and are offset by the project's mitigation, including the dedication of more than 78 acres of Conserved Habitat, the funding the management of such habitat for a 5-year period to build up the principal in the HCP Trust, and the additional management and monitoring that will be carried out as the result of the supplemental funding provided by the project.
- Management and monitoring within Conserved Habitat are a continuation of existing practices and are beneficial to the listed species, even though these activities may result in a small amount of take of callippe and other listed species of concern. Authorization of take for the callippe would allow the implementation of landscape-level management measures (e.g., grazing, mowing). These measures have been shown to benefit butterfly habitat by effectively controlling invasives and will result in an increase in the total area being managed.

- Funding provided by VTM 2007 allows for additional management and monitoring activities to be undertaken, which will significantly benefit HCP species of concern, including callippe. The supplemental funding and the existing HCP funding are sufficient to carry out the management and monitoring activities specified in the HMP, which includes programs to manage and monitor all of the Conserved Habitat within the Mountain.

C. Statutory Findings

Because the Amendments are being processed according to the procedures outlined in the HCP, the statutory findings pursuant to Section 10(a)(2)(B) of the ESA and implementing regulations (50 CFR § 17.32(b)(2)(i)) are not required. However, the Amendments satisfy the statutory and regulatory requirements, as described below.

- *The take will be incidental to otherwise lawful activities.* Take would result from construction of approved development plans for 2007 VTM and from implementation of the authorized management and monitoring activities described in the 2007 VTM.
- *The applicant will minimize and mitigate the impacts of the take to the maximum extent practicable.* Development of the 2007 VTM has minimized take by clustering previously allowed development into one area that substantially avoids impacts to hilltop habitat. The 2007 VTM also reconfigures the development plan adjacent to Guadalupe Canyon Parkway to include catchment (retaining) walls that minimize loss of habitat from permanent and temporary disturbances and to preserve butterfly movement corridors adjacent to Guadalupe Canyon Parkway. The development also significantly expands funding (increasing annual charges to \$800 per residence and establishing a \$4 million non-wasting endowment) available for management and monitoring throughout the Mountain's Conserved Habitat. Brookfield Northeast Ridge II, LLC will fund the management and monitoring of undisturbed and temporarily disturbed habitat within Unit II for five years, allowing the HCP Trustees to build up a reserve from the annual residential fees collected prior to assuming management responsibilities for the Conserved Habitat in Unit II. Additional minimization and avoidance measures, such as timing restrictions on construction activities, are not practical due to the increased costs and delays associated with the marginal benefit to butterflies. Management and monitoring activities are generally conducted in a manner that avoids take, but unavoidable impacts (primarily from grazing and burning) will be minimized by limiting the extent of areas that are managed each year and by timing activities to occur outside biologically sensitive periods of the butterflies' life cycles.
- *The applicant will ensure adequate funding for the conservation plan and procedures to deal with unforeseen circumstances.* As noted above, the Amendments would significantly expand the funding available for management and monitoring of the Mountain's Conserved Habitat. The amount to be provided is sufficient to fund activities called for in the 2007 HMP, including provisions for adaptive management. The funding measures, which have been incorporated into the project description in these Amendments, are required through an agreement between Brookfield Northeast Ridge II,

LLC and the City of Brisbane. The endowment is funded incrementally through the sale of homes in the development area. The annual charges for homes within the development area will be collected in the same manner as existing HCP charges. Restoration of the temporarily disturbed areas requires a performance bond that is released only upon successful restoration with native plants.

- *The take will not appreciably reduce the likelihood of the survival and recovery of the species in the wild.* Take of individual butterflies and the loss of habitat authorized by the Amendments would be minimal and insignificant in comparison to the size of the Mountain's populations and habitat areas as a whole. The authorized take will not reduce the likelihood of survival and recovery of the listed butterfly species, including the callippe. Moreover, these effects would be offset by the conservation measures described above, including the implementation of additional management and monitoring activities within Conserved Habitat and the dedication of additional Conserved Habitat.
- The measures required by the USFWS, if any, will be met. No additional measures are expected to be required.
- *The USFWS has received any other assurances it requires that the HCP will be implemented.* The HCP has been successfully implemented to date, and no additional assurances are required. The proposed funding from the development in the Northeast Ridge is required through an agreement with the City of Brisbane; Brookfield Northeast Ridge LLC has already paid \$772,727.27. The USFWS will continue to participate in the meetings of the TAC to monitor the implementation of the Amendments and the management and monitoring activities called in the HMP.

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Mark Heath, Shelterbelt Builders, Personal communication April 2004 regarding Viola propagation.

Patrick MacNamara, Pointe Pacific Native Plant Committee, Personal communication January 2004.

Stewart Weiss, PhD, Biologist, Creekside Science. Personal communication regarding bay checkerspot butterfly, nitrogen deposition, and grazing in January and June 2007.

Stuart Weiss, PhD, Biologist. Personal communications regarding adult and larval monitoring for the San Bruno elfin butterfly, January 1998.

FIGURES

Figure 1. Northeast Ridge

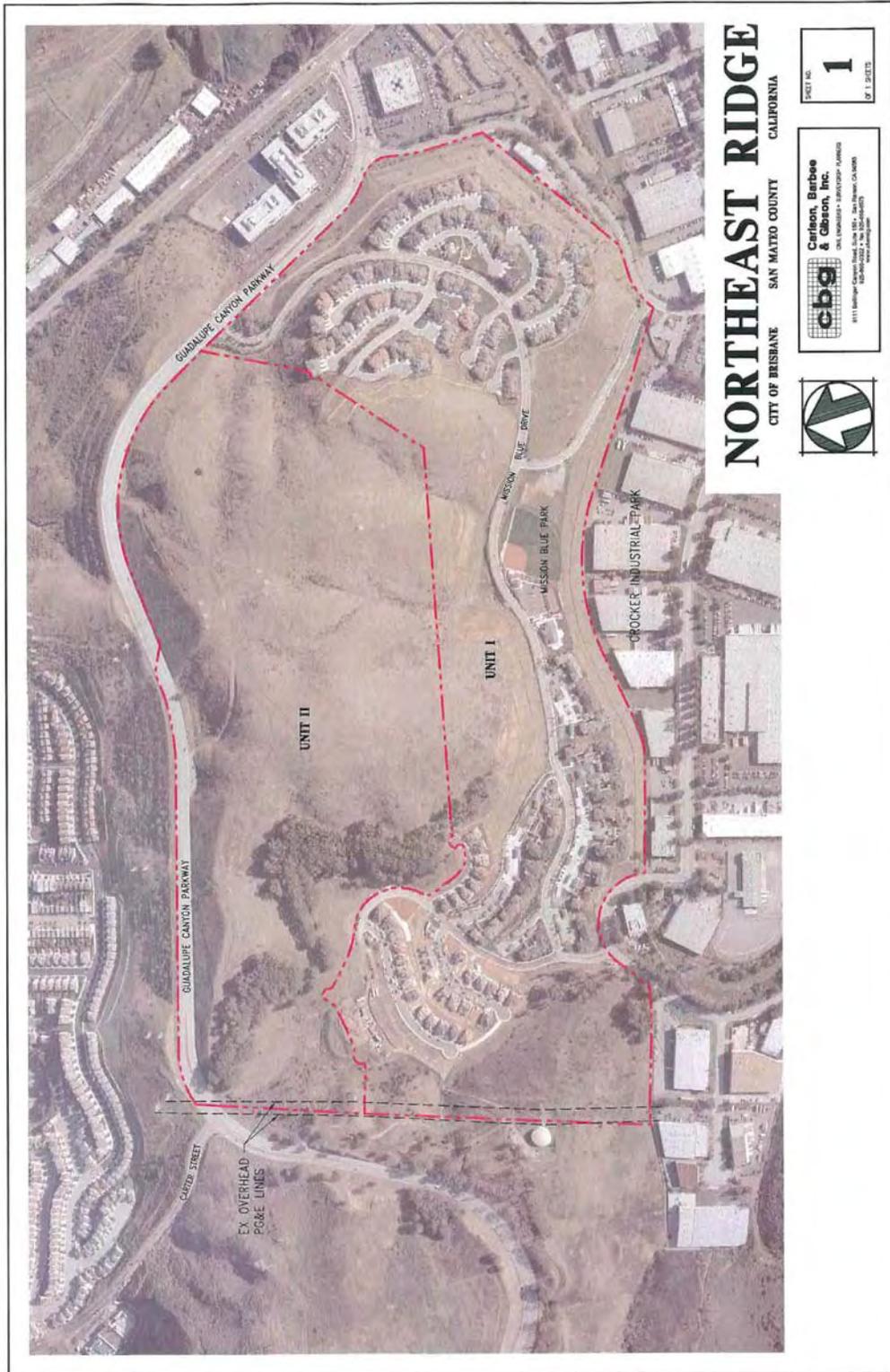


Figure 2. 1989 VTM



Figure 3. 2007 Infrastructure Grading

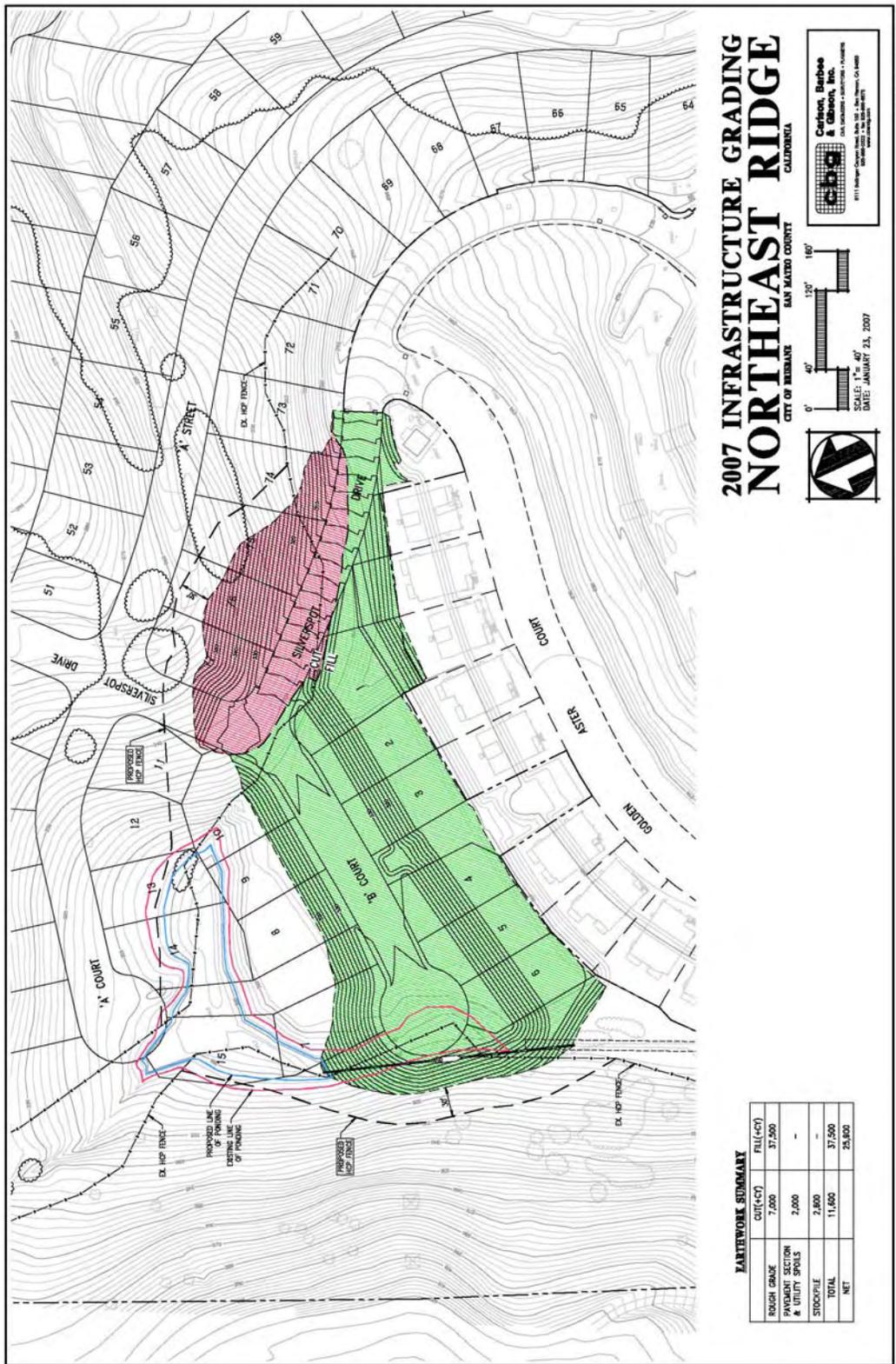


Figure 4. 2007 VTM

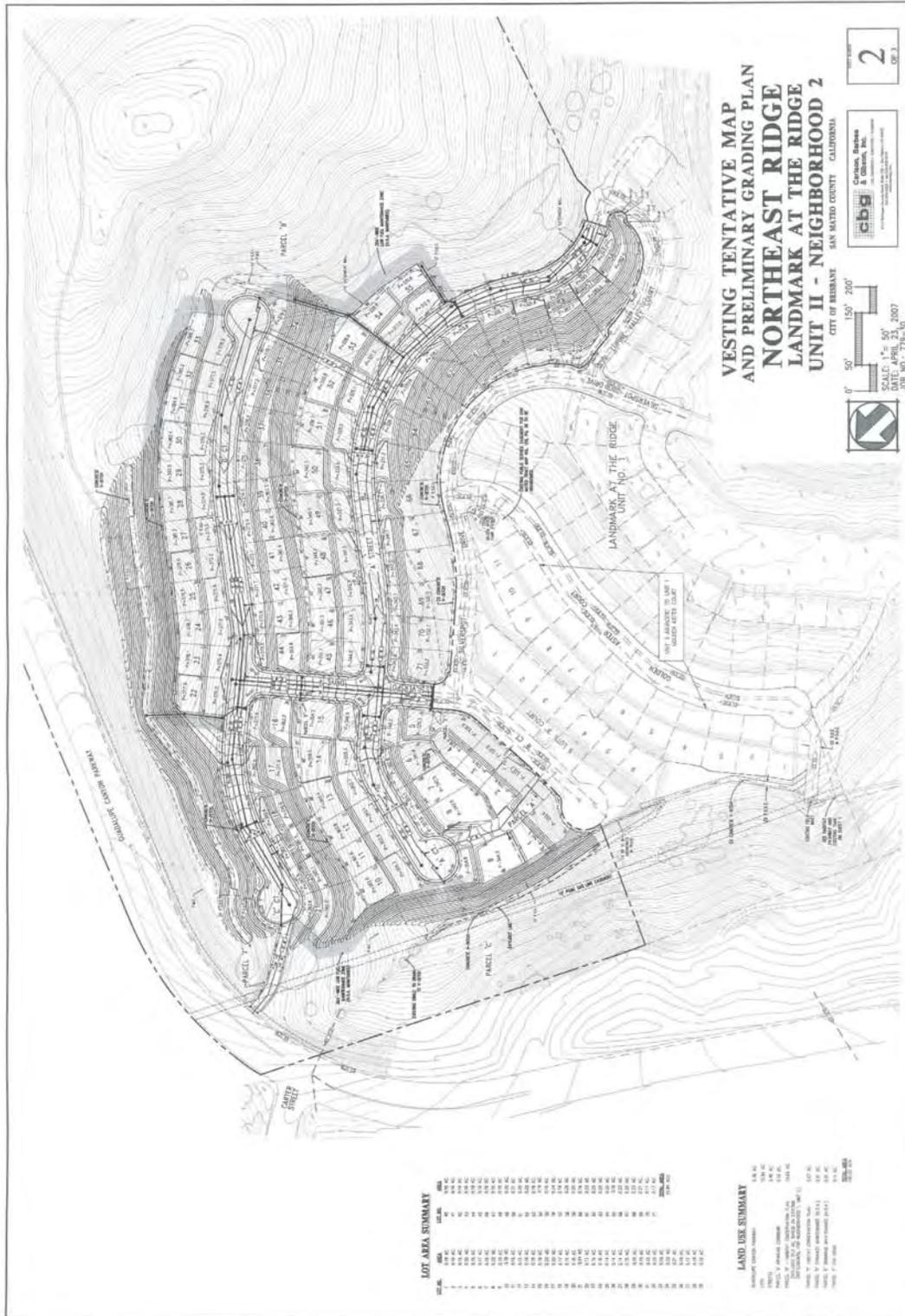


Figure 5. Viola Distribution on San Bruno Mountain

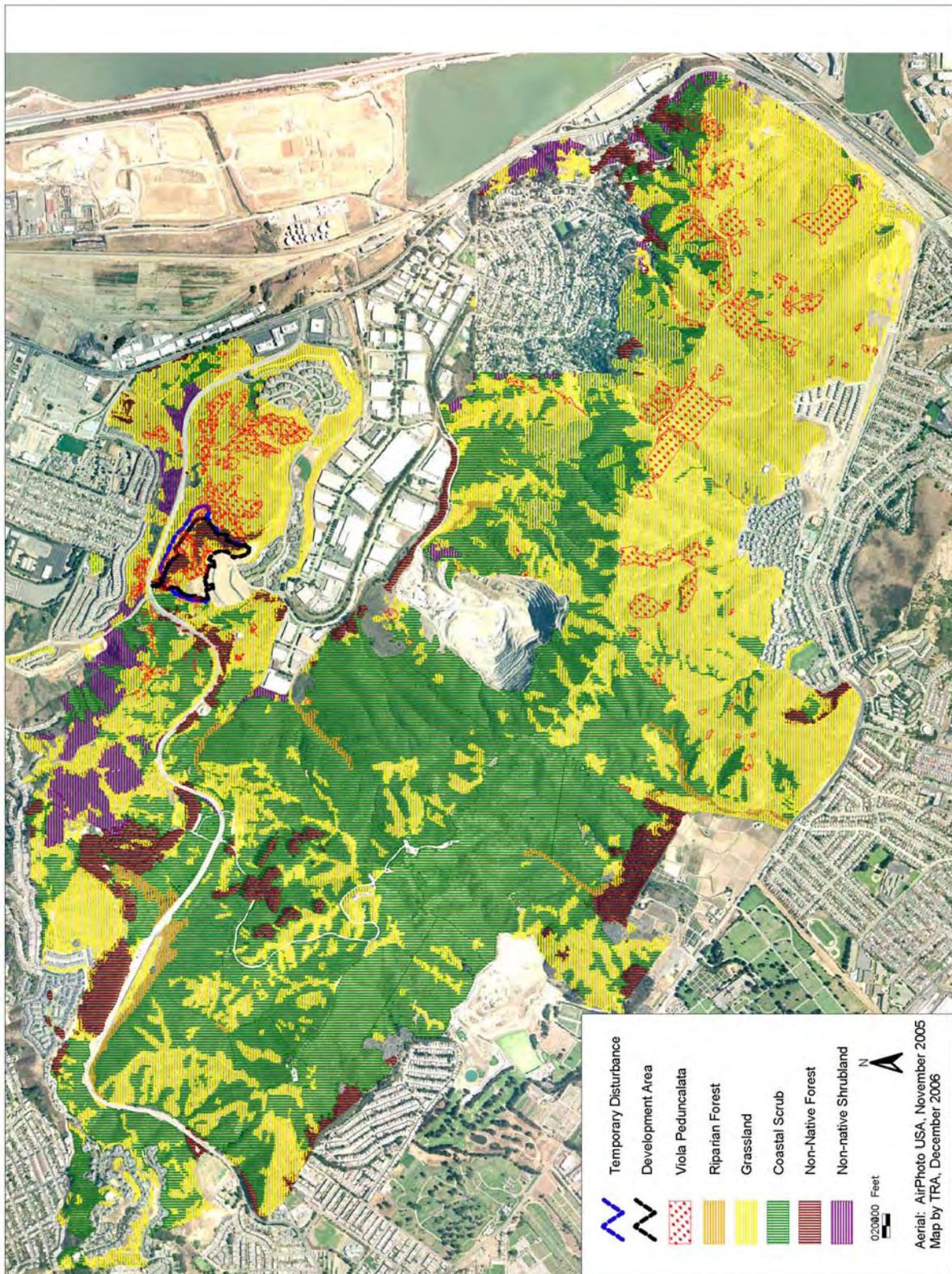


Figure 6A. 2000 Viola Distribution and Estimated Impacts of 2007 VTM

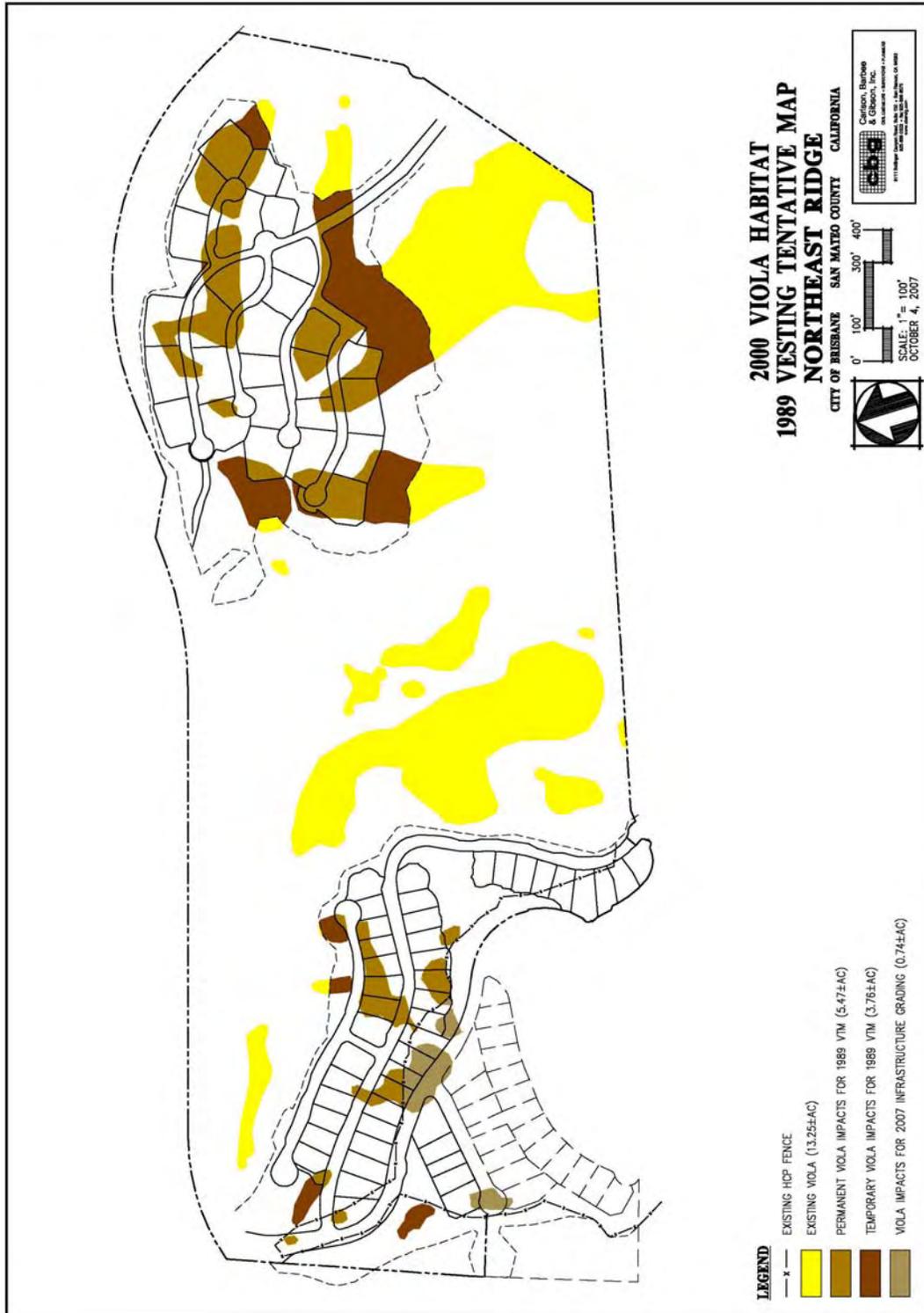


Figure 6B. 2004 Viola Distribution and Estimated Impacts of 2007 VTM

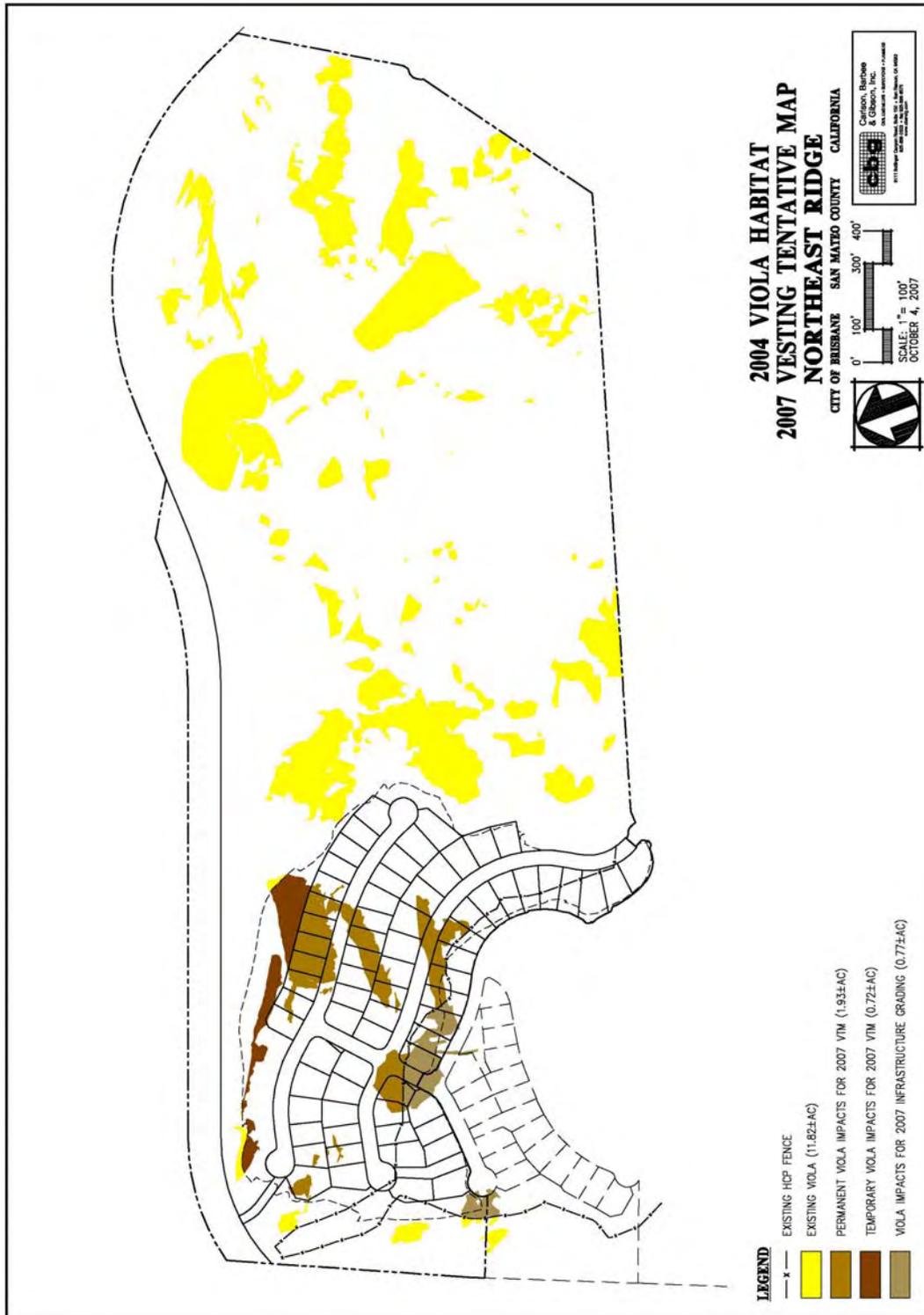


Figure 6C. 2005 Viola Distribution and Estimated Impacts of 2007 VTM

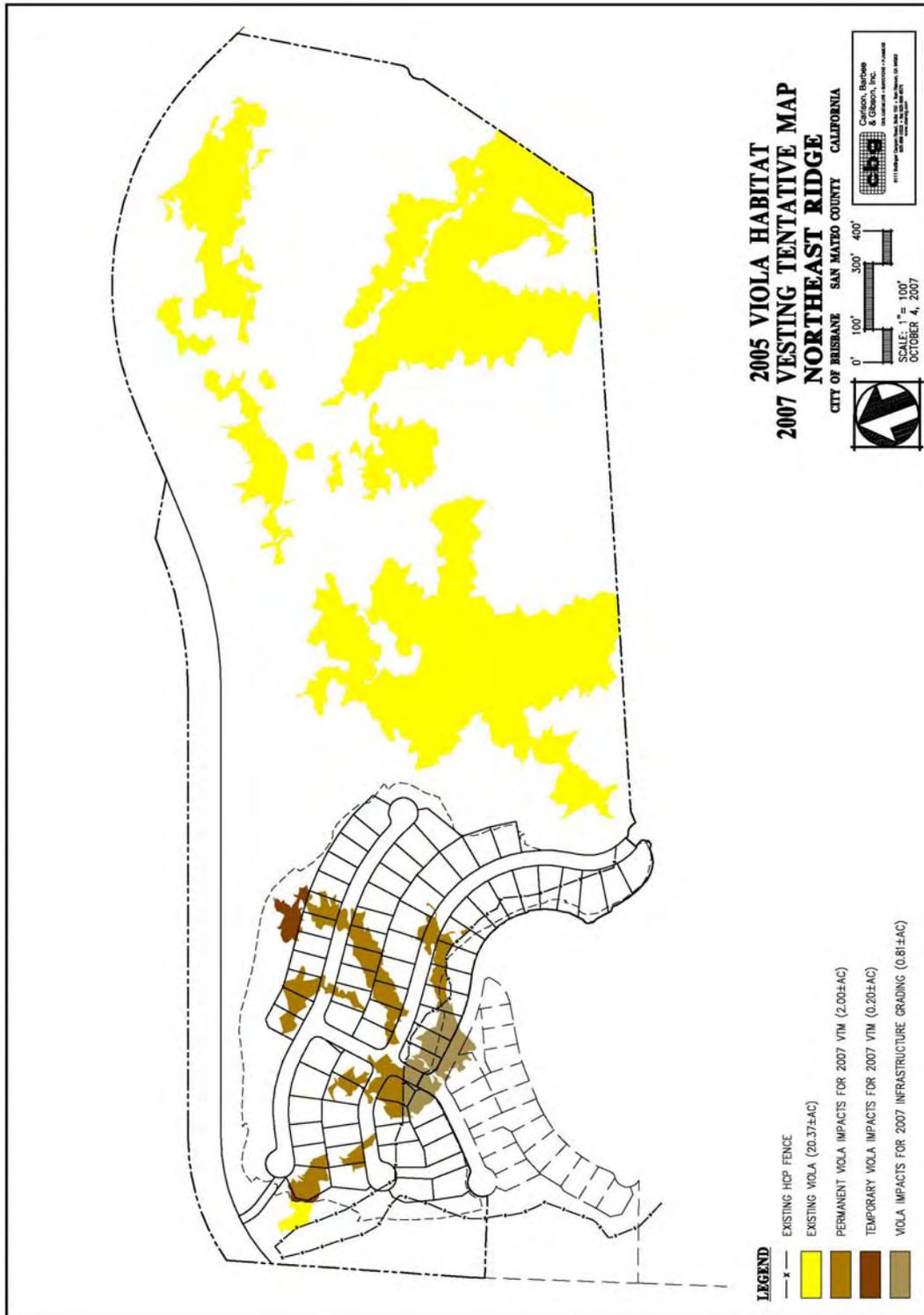


Figure 7A. 2000 Viola Distribution and Estimated Impacts of 1989 VTM

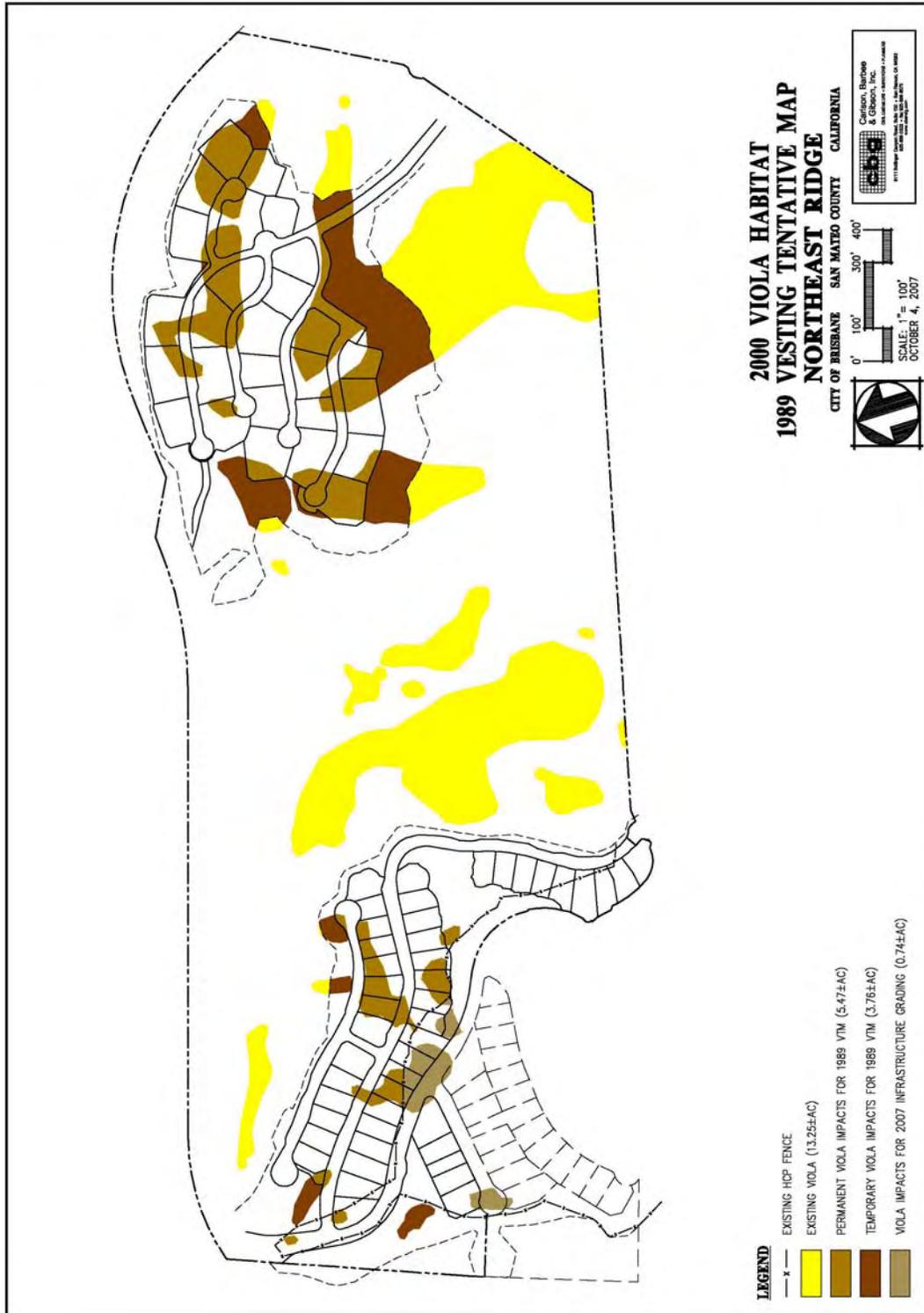


Figure 7C. 2005 Viola Distribution and Estimated Impacts of 1989 VTM

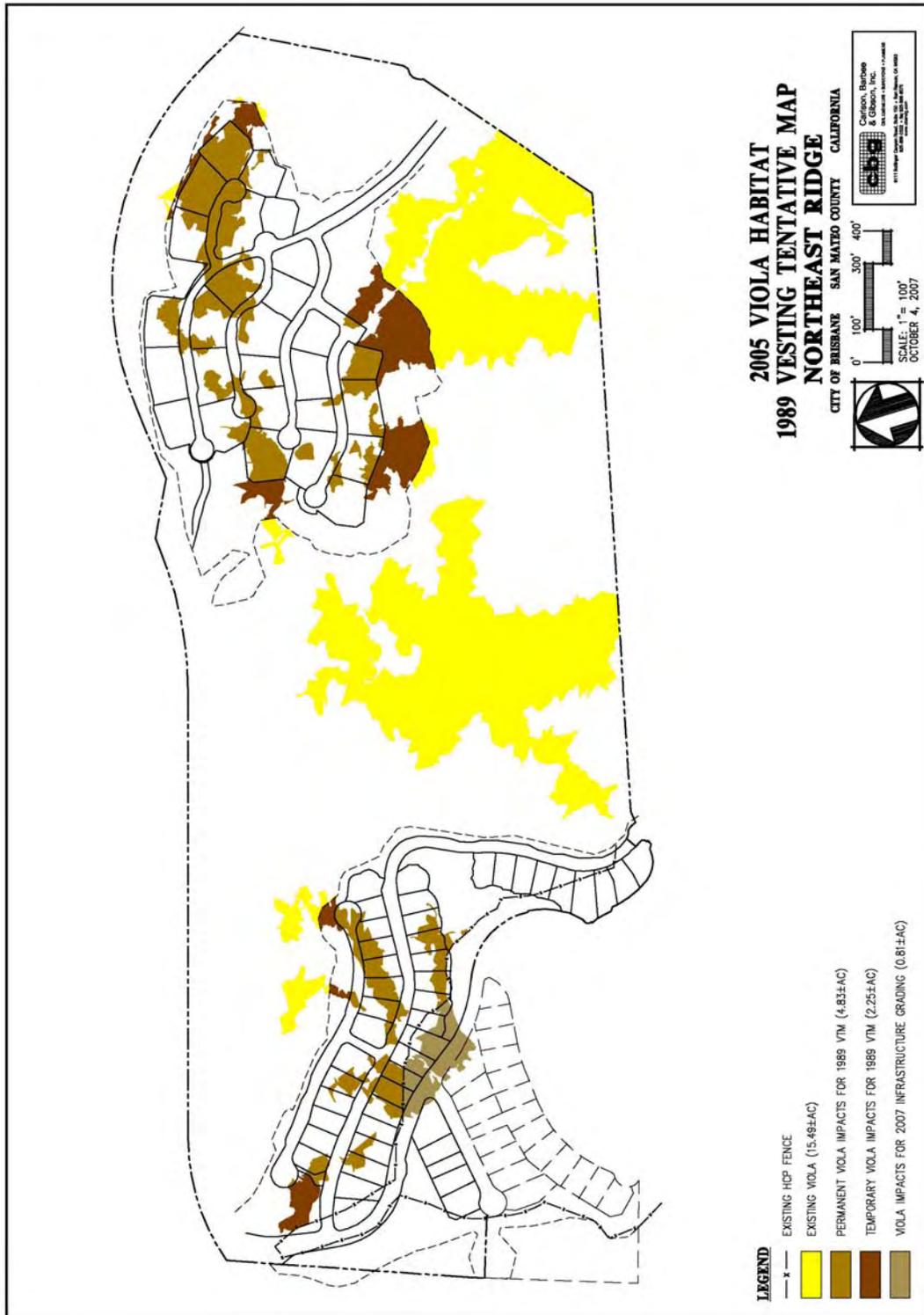


Figure 8. Callippe Observations Crossing Guadalupe Canyon Parkway

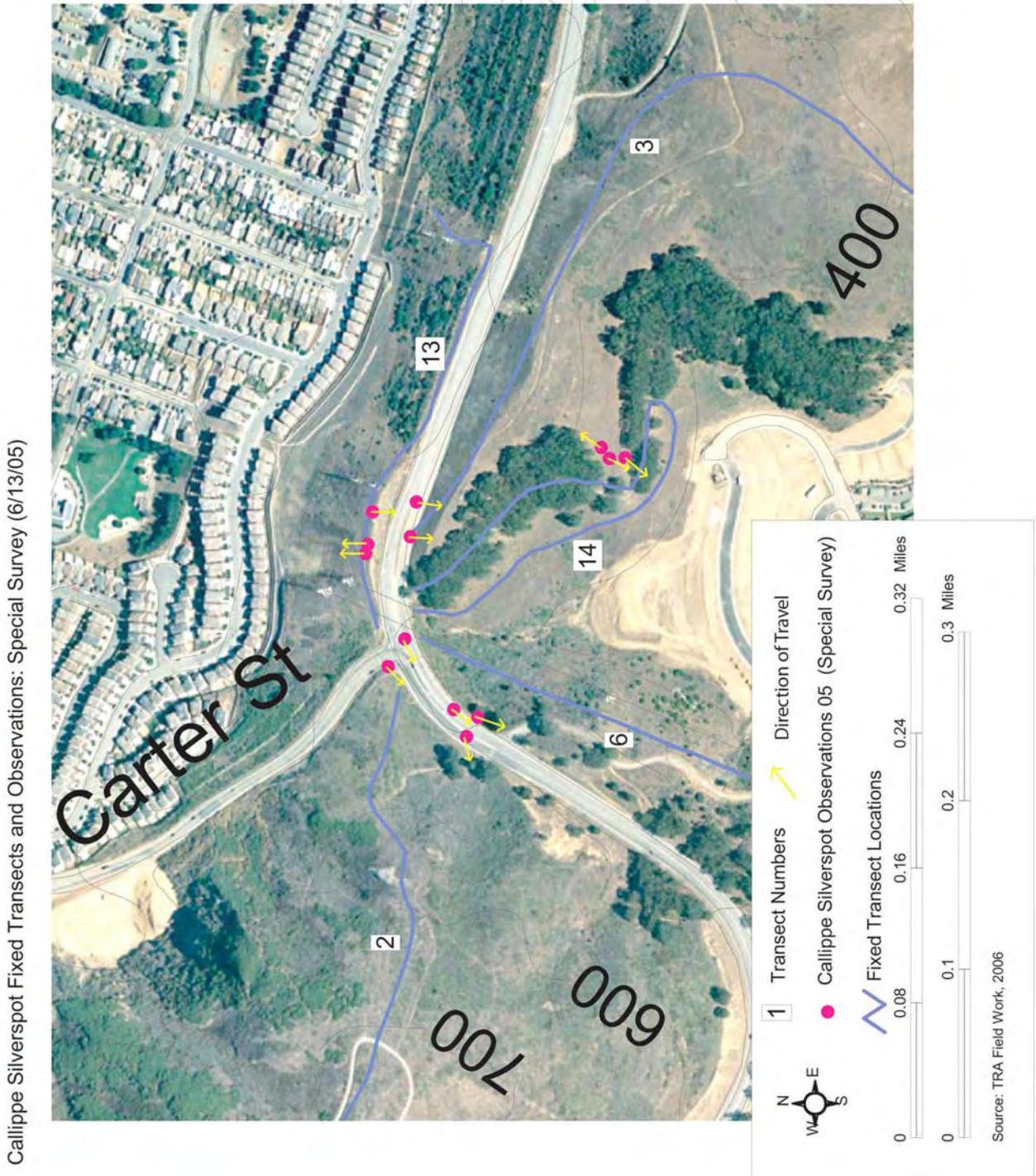


Figure 9. Existing Developed and Protected Lands on San Bruno Mountain

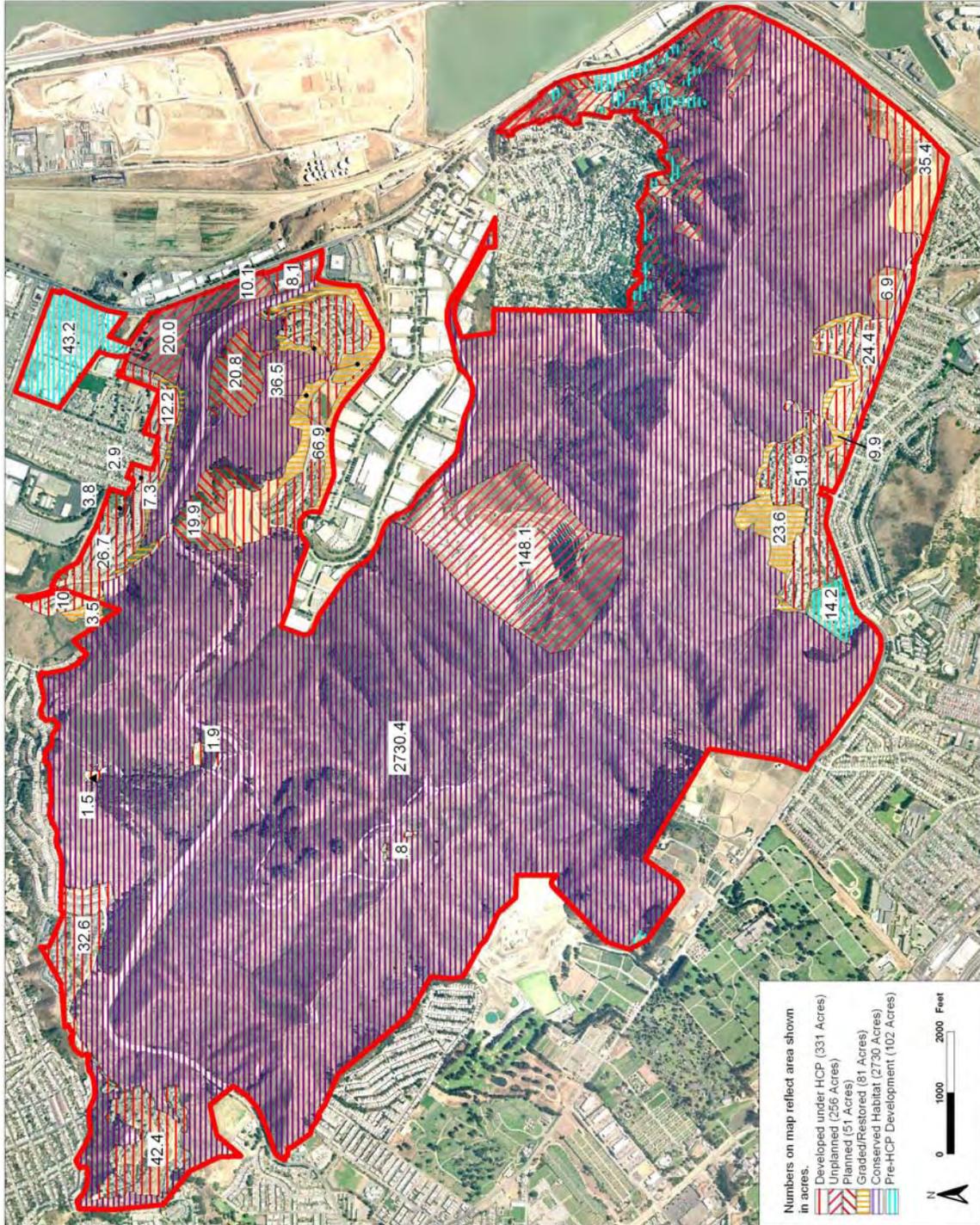


Figure 10. HCP Parcel Map

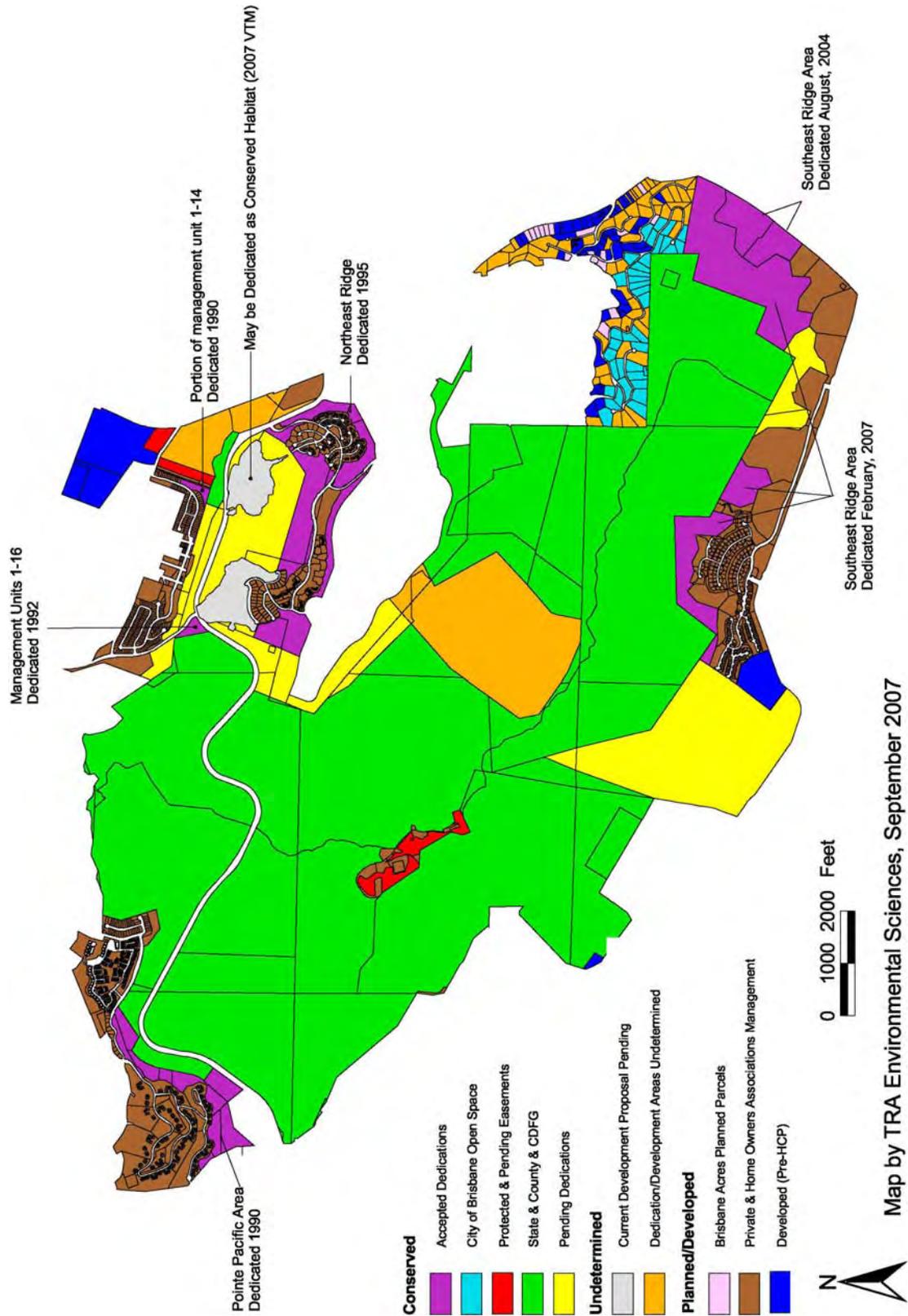
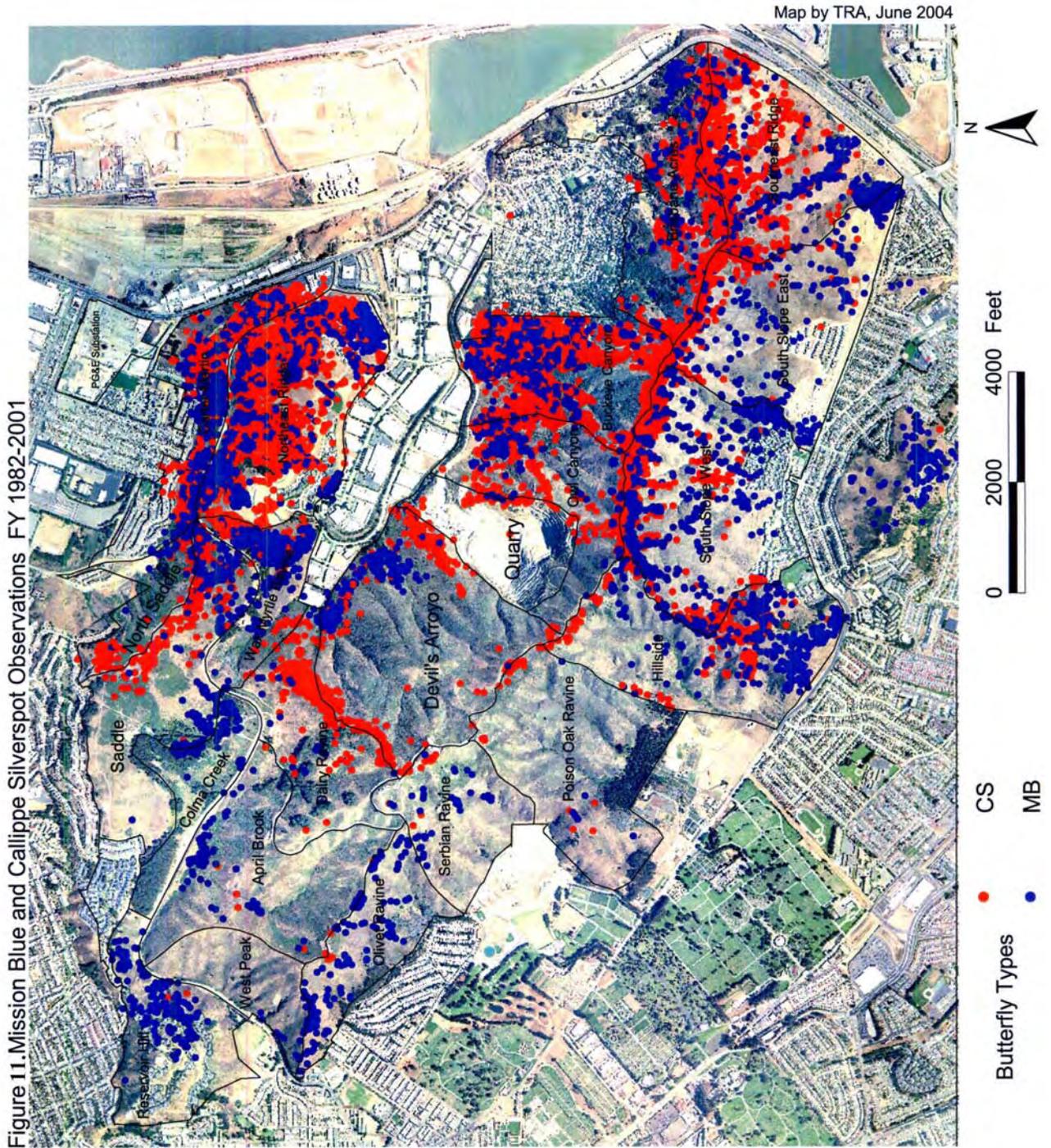


Figure 11. Callippe Distribution on San Bruno Mountain



Appendix A. Proposed Amendments to HCP

A. PROPOSED AMENDMENTS TO HCP

1. Section V.B

Section V.B of the HCP would be amended as follows. Text to be deleted from the existing HCP is indicated with ~~strike through~~ font, while text being added is double underlined.

B. FUNDING PROGRAM

A basic element of the HCP is creation of a funding mechanism which is able to support the monitoring, research, enhancement and other conservation techniques provided for in this HCP for permanent habitat conservation. The amount of funding must be adequate and protected against inflation. It does not seem possible to provide permanent, inflation-free funding solely by reliance on discretionary appropriations from public entities. As a result, the HCP proposes to rely on private funding for habitat maintenance. Funds for habitat maintenance would be deposited in ~~three~~ four distinct but overlapping phases: initial funding, service contract funding, ~~and~~ permanent funding, and supplemental funding.

- 1) Interim funding will begin upon the execution of this Agreement, and will be paid by the Landowners. Upon full implementation of the program, it is anticipated that the total amount of interim funding paid by the Landowners will be approximately \$50,000.00 per year.
- 2) Funds will also be raised through fees charged to the developers for monitoring of development, and for consultation provided to the developers, by the Plan Operator. The fees charged will cover the Plan Operator's costs and expenses and will also provide some extra money for operation and enhancement of the Conserved Habitat.
- 3) Except as provided herein, permanent and ongoing funding for habitat operation, maintenance and enhancement will be provided by a \$20.00 annual charge per dwelling unit within the Development Areas and a \$10.00 annual charge per 1,000 square feet of floor area of private non-residential development on the mountain. As the construction is completed and permanent funding is imposed, interim funding will be phased out. For all development within the City of Brisbane approved after [date of amendments], including development of the Northeast Ridge, as described in the Operating Program (Chapter 7), permanent and ongoing funding for habitat operation, maintenance and enhancement will be provided by an \$800 annual charge per dwelling unit (in 2005 dollars) and a charge on private non-residential development according to the following schedule (in 2005 dollars): \$55 per 1,000 square feet for the first 100,000 square feet, \$37.50 per 1,000 square feet for the next 100,000

square feet, and \$28.50 per 1,000 square feet for any area in excess of 200,000 square feet; for purposes of application of the private non-residential fee, the area of multiple buildings covered under a single project approval will be combined. Such charges will be adjusted annually for inflation, as provided for in the Agreement with respect to the San Bruno Mountain Habitat Conservation Plan.

- 4) Supplemental funding in the amount of \$4,000,000.00 will be provided by Brookfield Northeast Ridge II LLC pursuant to an agreement with the City of Brisbane. This supplemental funding will be used to establish a non-wasting endowment to be managed by the Trustees that will fund habitat operations, maintenance, monitoring and enhancement activities on the mountain.

Concurrently with the execution of this Agreement, the County and the Cities shall either enter into a trust agreement and thereby and thereupon establish the "San Bruno Mountain Area Habitat Conservation Trust Fund" (hereinafter "Trust Fund") or form an Assessment District or provide for other appropriate funding sources as provided below. The funding source shall have the duty to use the funds for habitat conservation on San Bruno Mountain so as to provide for the conservation of the Mission Blue, Callippe Silverspot and other Species of Concern and the San Bruno Mountain Area Ecological Community.

The trustees of the Trust Fund shall be the Managers for the County and the Cities who shall act and administer the Trust Fund solely for the purpose of providing the County with funds for the protection and enhancement of the Species of Concern by the operation, maintenance and enhancement of the Conserved Habitat for such purposes, all as set forth in greater detail in said Trust Agreement.

The funds will be paid annually to the funding source, as appropriate, and dedicated solely to habitat conservation activity. Upon full implementation of the program, it is anticipated that the amount of annual funding will be in excess of \$400,000.00, which has been determined to be sufficient for habitat conservation. The exact amount of annual funding cannot be calculated because Landowners will begin participation in the funding program at different times. The Trust will consist of one representative each from San Mateo County, Brisbane, Daly City and South San Francisco. The Trustees of the Trust shall have the duty to use the funds for habitat conservation on San Bruno Mountain so as to provide for the conservation of the Mission Blue, Callippe Silverspot and other Species of Concern and the San Bruno Mountain Area Ecological Community.

In connection with the subdivision, development and use of the Developable Administrative Parcels, the respective local agency having jurisdiction shall require, and in any event (except as provided in the Agreement) each Landowner with respect to each Development Area, or portion thereof, shall record, a covenant with respect to such Developable Administrative Parcels, or portion thereof.

Prior to the time when the funding from covenants and restrictions assessments provided for above becomes available, the parties shall establish an Interim Funding (Interim Fund) in the amount of at least \$50,000.00 per year for

preliminary habitat restoration activities, native plant seeding and species population monitoring, and other habitat enhancing and monitoring activities. It is anticipated that additional interim funding will come from new projects, contributions from public agencies and from fees for monitoring and consultation, so that the interim funding will probably be in excess of \$50,000.00 per year.

As a contribution to the Interim Fund, each of the following Landowners shall pay to the Plan Operator the amount of money set forth below opposite its name monthly in advance, commencing with the later of (i) the approval of a specific plan, rezoning for residential or commercial purposes, PUD, or tentative subdivision map for any portion of the Developable Administrative Parcel set forth opposite the respective Landowner's name below; or (ii) the execution of this Agreement by each Landowner.

<u>Landowner/Developable Administrative Parcel</u>	<u>Monthly Payment</u>	<u>Pro Rata Limit</u>
Cadillac-Fairview Homes West: Northeast Ridge Project	\$ 1,956.67	\$ 23,480.00
W.W. Dean & Associates: South Slope Project	781.67	9,380.00
Presley: Reservoir Hill	681.67	8,180.00
Foxhall Investment, Ltd: Rio Verde Estates and Rio Verde Heights	746.67	8,960.00

With respect to all other Developable Administrative Parcels, the Landowner with respect thereto, upon the approval of any PUD, tentative subdivision tract map, building permit, grading permit, conditional use permit or special use permit shall be required to commence and continue paying to the Plan Operator for the Interim Fund, in the same manner and to the same extent provided above with respect to the Landowners specified in this subsection, a charge in the amount of \$20.00 per year for every residential unit and \$10.00 per year per 1,000 square feet of non-residential floor area proposed to be developed under the approval sought.

In the event that any of the Landowners above fails to meet its interim habitat funding obligation, the obligation to make payments shall terminate and the respective Landowner shall thereafter have no obligation to make further payments and the Landowner shall lose its rights and benefits under the Section 10(a) Permit.

As the permanent funding provided becomes available, the Interim Funding shall be phased out.

The parties to this Agreement recognize and agree that the permanent charge/assessment may be satisfied through collection on the annual County property tax bill of an equivalent amount. Such collection may be through an assessment levied by a public entity or district such as a landscape and lighting district pursuant to Streets and Highways Code §§ 22500-22679, an open space maintenance district pursuant to Government Code §§ 50575-50628, or some other mutually agreed upon funding source.

All parties agree to cooperate in good faith in the formation of such a funding source as is selected by the Cities and the County and the Landowners shall consent to the formation of any such funding source so selected.

2. Section V.G

Section V.G of the HCP would be amended as follows. Text to be deleted from the existing HCP is indicated with ~~strike through~~ font, while text being added is double underlined.

G. PROPOSED INCIDENTAL TAKE PERMIT

The County of San Mateo and the cities of Brisbane, Daly City and South San Francisco ~~will be joint applicants for~~ received a permit for taking of the Mission blue and other listed species under Section 10(a) of the Endangered Species Act. Each of the four local governments ~~will be~~ are named as a permittee.

The permit application ~~will~~ sets forth proposed conditions under which the local governments will operate. The conditions ~~will~~ include the following:

1. No taking of Mission blue on San Bruno Mountain shall occur except in compliance with procedural and substantive requirements of the Agreement.
2. The conserved habitat shall be held, used and administered in accordance with the HCP and Agreement.
3. The development areas shall be used and administered in accordance with the conditions in Chapter VII of the HCP.
4. A permanent institutional structure and funding mechanism shall be established in accordance with Chapter V of the HCP and compliance with the applicable funding requirements shall be demonstrated by each developer prior to the issuance of any grading permit or building permit.
5. The permit shall be valid for an initial thirty year term, from 1983 to 2013.
6. The Agreement, as required by Chapter V of the HCP, shall be executed concurrently with the issuance of the Section 10(a) permit.

Furthermore, the City of Brisbane and the County of San Mateo have applied to amend the permit to provide for take of the callippe silverspot and the bay checkerspot butterfly under Section 10(a) of the Endangered Species Act. The amended permit will set forth the following additional condition under which the City of Brisbane and San Mateo County will operate.

1. No taking of callippe silverspot or bay checkerspot butterfly on San Bruno Mountain shall occur except in compliance with procedural and substantive requirements of the HCP.

3. Chapter VII

The Operating Program for the Northeast Ridge in Chapter VII of the HCP would be replaced with the following:

REVISED OPERATING PROGRAM

Planning Area: Northeast Ridge (1)

Administrative Parcel: Northeast Ridge Project (07)

Location and description: The Northeast Ridge is located in the northeast corner of San Bruno Mountain. It is bounded on the south by the Crocker Industrial Park, on the north and east by Guadalupe Canyon Parkway and on the west by a P G & E transmission line (Figure 1-07 A). It has a hilly terrain which supports four vegetation types: annual grassland, coastal scrub, riparian/wetland, and introduced exotics (eucalyptus, gorse). Approximately 90% of the site is annual grassland.

Ownership: The undeveloped Unit II portions of the site are owned by Brookfield Northeast Ridge LLC, and future development of the Unit II project is under the supervision of Brookfield Homes.

Project: The development of 71 single-family homes in the Unit II, Neighborhood II.

Status: This is a planned parcel. The original Concept Plan was submitted and approved by the Task Force and Local Agency at Public Forums in March and April 1982. A Specific Plan was submitted to the City of Brisbane and County of San Mateo in Sept. 1982. An EIR was prepared on the Specific Plan. In November 1989, the Brisbane City Council approved a vesting tentative subdivision map and related applications for a project of 578 dwelling units. In August 1990 the U. S. Fish and Wildlife Service approved the Northeast Ridge Equivalent Exchange Amendment to the HCP. In 2007, Brookfield Homes submitted a revised development plan for Unit II, and the U. S. Fish and Wildlife Service approved an Amendment to the HCP and Section 10(a) permit which incorporates the revised plan and which includes take authorization for the callippe silverspot in the Landmark II development area.

Biological Issues: The Northeast Ridge includes rolling hillsides, terraces and slopes and residential development on the lower slopes. Even with the development, it remains an important habitat area for the callippe silverspot and the mission blue butterfly. Within undeveloped areas of the Northeast Ridge, grasslands are the dominant community and abundant host plants for both the callippe silverspot and mission blue are present. The area is mostly grassland with some areas converting to coastal scrub. A large eucalyptus grove is also present on the site. The grasslands are dominated by non-native annual grasses and herbaceous weeds in many areas, yet the area still supports the butterfly host plants and the rare butterflies in high numbers. Control work on French broom, eucalyptus and fennel has been successful, however non-native annual grasses and weeds such as Italian thistle and wild radish still pose potential threats to the fragile grassland.

Impact: The development of the Unit II, Neighborhood II phase of the Northeast Ridge development will disturb approximately 19.64 acres of land, 16.67 acres will be permanently converted to urban uses, while 2.97 acres will be subject to habitat restoration. Approximately 12 acres of the total area disturbed by the Unit II project is grassland. Of that, approximately 2.27 acres of the total area disturbed is occupied by Johnny jump-up (*Viola pedunculata*), which is the callippe silverspot butterfly's larvae food plant. The loss of grassland represents roughly 1% of the remaining grassland on San Bruno Mountain as mapped in 2003. The loss of viola represents roughly 1.7% of the remaining viola on San Bruno Mountain. Habitat that supports the mission blue butterfly will also be removed as a result of the development of Unit II, Neighborhood II.

HCP Objectives -- Specific Conservation Needs: Since the Northeast Ridge parcel comprises a major portion of the San Bruno Mountain butterfly population, intensive mitigation and enhancement activities are warranted. However, because development planning was sensitive to the needs of the butterfly populations and the findings of the Biological Study, no specific habitat manipulation is required within the development boundaries (permanently and temporarily disturbed areas), with the exception of reclamation of cut and fill slopes. The enhancement activities will focus on expanding and improving habitat in the Conserved Habitat areas which will eventually be dedicated to the County.

Habitat conservation measures include: retention of large, contiguous, and diverse areas of Conserved Habitat around the development sites; reclamation of cut and fill slopes with host plant species; phasing of development so that lower grade habitat areas are disturbed first; coordination with other developments in the planning area through the Plan Operator so that the total impact on the species of concern is minimized; both temporary and permanent protection of the Conserved habitat, initially from construction activities and finally from human encroachment; the use of habitat enhancement techniques to improve and expand the Conserved Habitat; and dedication of the Conserved Habitat once development has been assured. Finally, monitoring should take place to assess the effect of the above measures.

The ultimate Conserved Habitat area, which is shown as Management Unit 1-07-03 in Figure 1-07 C, will consist of everything but the permanently disturbed areas, shown as Management Units 1-07-01 to 1-07-02 in the same Figure. The developer will be financially responsible for reclaiming all of the temporarily disturbed areas within the Conserved Habitat area until an offer of dedication is accepted by the County.

Operating Program

Obligations: The landowner/developer has the following obligations:

1. No construction or conversion to urban uses shall be permitted in the area designated 1-07-03 on Figure 1-07 B. The boundary of area 1-07-03 may be adjusted by the Landowner by not more than thirty (30) feet from the line shown on Figure 1-07 B, provided, however, that the total area increased as a result of such adjustment does not exceed five (5%) percent of the total Conserved Habitat in this Administrative Parcel. Outside area 1-07-03 construction and conversion

to urban uses may occur subject only to the conditions set forth in Paragraph 2 below.

2. Prior to any construction within Administrative Parcel 1-07, the Landowner shall provide for the following:

a. Dedication of Conserved Habitat. The Landowner shall agree to dedicate to the County all lands within Administrative Parcel 1-07 within the Phase II dedication area shown in Figure 1-07 D and as adjusted by the Landowner pursuant to Paragraph 1. Such dedication shall be offered by the Landowner at the time of recordation of the final map for Unit II, Neighborhood II, as shown on Figure 1-07 B.

b. HCP Funding Program. During the project development phase, the Landowner will enter into a contract with the Plan Operator to pay the reasonable cost of supervising the HCP restrictions on grading and supervising the reclamation of habitat. The monitoring and consultation funding shall be paid in accordance with Chapter VI. A. 5 of the Implementation Agreement.

Pursuant to an agreement with the City of Brisbane, the Landowner shall fund the HCP Endowment by \$4,000,000.00, subject to reimbursement from other future developments, if there are any, within the area covered by the HCP. This Endowment would be incrementally funded from the sale of each home within Unit II, Neighborhood II and 17 homes that were incorporated into Unit I. It is expected that this endowment would generate over \$200,000 per year in interest, available to the HCP Trustees. If any future developments are approved within the HCP area, 75% of the future development's HCP Endowment contribution be used to reimburse Landowner for its HCP Endowment contribution. The remaining 25% would be contributed to the HCP for additional management funding.

Owners of each of the homes within the Unit II, Neighborhood II will be required to \$800 per year in HCP annual charge for residential dwelling units, based upon 2005 dollars. These assessments would be tied to the Construction Price Index ("CPI") escalation mechanism. Upon issuance of the Certificate of Occupancy and when the title is transferred, the HCP charge would be applicable. These HCP charges would be paid through the Homeowners Association and transferred to the County for use by the Trustees for ongoing habitat operation, maintenance and enhancement.

c. Salvage Provisions. Prior to grading, transplant Viola from grading footprint to areas where CS habitat is being restored (areas where scrub or non-natives have been removed). As much as possible, the ground around the Viola should be moved with it in an effort to transport any larvae that may be around the base of the plant.

d. Reclamation Provisions. With respect to any areas which are to be graded or disturbed and thereafter dedicated as Conserved Habitat, the Landowner shall prepare a Reclamation Plan for approval by the City (or County, as the case may be) in accordance with its normal standards and procedures for grading permits. These provide for grading to be accomplished, erosion and run-off controls, and revegetation with native grassland species approved by the Plan Operator. In addition, the Landowner shall clearly define on the ground (by snow or two strand wire fencing or other methods) the limits

of disturbance anticipated and shall limit the construction disturbance to said limits as provided in fencing and signing provisions of the MOU and Chapter 5. The fencing shall be constructed at the boundary between temporarily disturbed areas and undisturbed areas as shown in Figure 1-07 B. At the time of approval of the reclamation plan(s), those plans shall substitute for the more generalized maps referenced in this section.

A performance bond shall be secured through the City of Brisbane for all restoration/reclamation activities prior to disturbance of the site. The amount of the performance bond shall be the amount determined by the Plan Operator to be adequate to ensure proper performance of the restoration/reclamation activities based. The City of Brisbane shall release the bond to the Landowner only after the Plan Operator has determined the restoration/reclamation activities have been successfully completed. The funds will not be obtained from the HCP fund to meet the restoration/reclamation obligations. If restoration/reclamation is not completed by the Landowner, the bond will be used to fund completion of the activities.

The Landowner shall maintain temporarily disturbed and undisturbed open space areas Management Unit 1-07-03 for a period of five years, enabling the HCP Trustees to collect HCP charges while the Landowner completes the reclamation of the temporarily disturbed areas. The dedication of temporarily disturbed and undisturbed open space areas subject to maintenance and turnover criteria that defer the timing of the HCP Trustees' obligation to commence maintenance allows the HCP Trustees to collect the HCP charges from occupied residences within Unit II, Neighborhood II and to build up a reserve before the HCP Trustees assume management responsibilities for these areas.

e. Pesticide Control. The Landowner shall establish covenants and restrictions encumbering Development Areas in favor of the County and/or City prohibiting the use of aerial or large-scale spraying of pesticides without the approval of the Plan Operator.

f. Buffer Areas. The Landowner shall covenant in favor of the City of Brisbane and the County to establish and maintain a buffer area of up to thirty (30) feet in width to protect urban uses within the Development Areas from fire. Native plants, which will not present an invasion threat to grasslands within the Conserved Habitat, are preferred. These buffer areas will be maintained by the Homeowners Association.

g. Inspection. The Landowner shall, in carrying out Reclamation Plans for Administrative Parcel 1-07, contract for an inspector acting for the County as Plan Operator to monitor grading and revegetation activities through completion of the reclamation activities and acceptance of the offer of dedication.

The Plan Operator has the following obligations:

1. Prepare and execute an annual operating program for the Conserved Habitat within Administrative Parcel 1-07 and comply with mitigation measures set forth for Management Unit 1-07-03;
2. Monitor the effect of all activities within Development Areas on adjacent Conserved Habitat and provide advice and direction to the Landowner to assist

his compliance with the obligations described above with respect to Administrative Parcel 1-07;

3. Designate vegetation materials for use in Reclamation Plans and review such Reclamation Plans submitted by the Landowner with respect to Administrative Parcel 1-07 in a timely fashion to avoid delays in the implementation of such Plans;
4. Manage habitat strips along both sides of GCP and the area around the water tank as butterfly movement corridors to facilitate exchange of butterflies from NER to Saddle areas. To achieve this, the coastal scrub areas north of GCP and near the water tank will need to be opened up and restored to grassland habitat.
5. Accept dedications of Conserved Habitat within Administrative Parcel 1-07.
6. Notify the U. S. Fish and Wildlife Service immediately of the finding of any endangered species found dead or injured as a result of activities authorized under the Section 10(a) permit. Notification must include the date, time, and location of the specimen and any other pertinent information. The Service contact person for this information is Ms. Lori Rinek at (916) 414-6600. Any mission blue butterflies found dead or injured shall be deposited with the California Department of Fish and Game.

Management Units:

1. **1-07-01.** This unit contains the permanently disturbed areas of the Unit I development.
2. **1-07-02.** This unit contains the permanently disturbed areas of the Unit II development.
3. **1-07-03.** This unit contains all of the ultimate Conserved Habitat in the parcel. The measures discussed below will be carried out by the developer/landowner until such time the Plan Operator accepts the dedication lands, at which time the Plan Operator will take over implementation of measure C.
 - a. Prior to or in conjunction with the Unit II construction, implement the reclamation plan for the temporarily disturbed habitat in accordance with the HCP Restoration Guidelines.
 - b. Prior to or in conjunction with the Unit II construction, eliminate or thin dense patches of exotics and brush in order to expand the usable habitat area. Replant with native plant species
 - c. Upon completion of (a) and (b) monitor and maintain the area for success of the habitat enhancement program for a period of 5 years.

Appendix B. San Bruno Mountain Habitat Management Plan 2007

Bound Separately

Appendix C. Site Activity Permit for 2007 Infrastructure Grading



CITY OF BRISBANE

50 Park Place
Brisbane, California 94005-1310
(415) 508-2100
Fax (415) 467-4989

January 18, 2007

Ms. Jesse Wild
U.S. Fish and Wildlife Service
2800 Cottage Way, Room W2605
Sacramento, California 95825

Re: Landmark at the Ridge, Unit II, Neighborhood II – 6 Lots at “B” Court

Dear Ms. Wild,

The City of Brisbane’s Department of Public Works (“City”) has reviewed Brookfield Homes’ proposed development plan for six (6) homes on “B” Court in the Unit II portion of the Northeast Ridge Vesting Tentative Map, and recommends the U.S. Fish and Wildlife Service issue a Site Activity Permit (“SAP”) for the purposes of protecting health, safety, property and welfare of the existing homes and open space in this area. The City understands that the SAP for this proposed development is allowed under the San Bruno Mountain Area Habitat Conservation Plan (“HCP”).

The majority of the “B” Court development area was disturbed and graded in 1996, except for a short reach of Silverspot Drive. These graded lots and streets now abut homes as well as HCP open space, creating fire suppression and emergency response concerns. The immediate development of these pads, streets and homes will complete all necessary improvements to provide the City with the capabilities to address these concerns. The City’s Fire Department used the Landmark I paved roadways and active water systems to effectively combat and control both the “Wax Myrtle Canyon” fire and the more recent fire which started at the base of this same canyon due to an electrical line failure; in both cases the presence of public improvements prevented a disaster in the HCP area.

The completion of “B” Court and Silverspot Drive will also implement the permanent drainage improvements needed to drain a large portion of the westerly area of the Northwest Ridge portion of the HCP. Currently, a temporary drainage pond and system exists in this area, which requires oversight and maintenance during storm events. The City prefers to have this temporary drainage system immediately replaced with a permanent drainage system that is not subject to maintenance during storm events.

08-19-05_6 lots at B Court_USFWS letter

Providing Quality Services

Ms. Jesse Wild
January 18, 2007
6 Lots at "B" Court
Page 2 of 2

Please accept this correspondence as the City's support for the immediate issuance of a Site Activity Permit for the development of the 6 lots and streets shown on the attached exhibit based upon health, safety and welfare concerns.

Please call me at (415) 508-2131 if there are any questions regarding this matter.

Very truly yours,



Randy L. Breault, P.E.
Director of Public Works/City Engineer

Encl: as stated

Cc: Clay Holstine, Hal Toppel, Robin Leiter, Bill Prince, Harvey Passinisi
Kevin Pohlson (Brookfield Homes)

08-19-05_6 lots at B Court_USFWS letter



From: Jesse_Wild@fws.gov
Sent: Thursday, January 25, 2007 5:43 PM
To: rbreault@ci.brisbane.ca.us
Cc: htoppel@netgate.net; KPohlson@brookfieldhomes.com; Kobernus@traenviro.com; harris@TRAenviro.com; rougerobin@yahoo.com; Eric_Tattersall@fws.gov; Lori_Rinek@fws.gov; Cay_Goude@fws.gov
Subject: Approval of Landmark at the Ridge, Unit II – 6 Lots at "B" Court

Mr. Randy L. Breault
Director of Public Works/City Engineer
City of Brisbane
50 Park Place
Brisbane, CA 94005-1310

Re: Landmark at the Ridge, Unit II -- 6 Lots at "B" Court

Dear Mr. Breault

I received your letter January 22, 2007, at our Sacramento Fish and Wildlife Office, requesting that we approve Brookfield Homes' proposed development plan for "B" Court in the Unit II portion of the Northeast Ridge Vesting Tentative map for the purposes of protecting health, safety, property, and welfare of the existing homes and open space in the area. We understand you would like to complete the slope stabilization, drainage improvements, and grading for the roads necessary to allow flood and fire protection for the surrounding area. Recognizing this is an emergency situation, the U.S. Fish and Wildlife Service will not obstruct any decision made by the City of Brisbane or San Mateo County for response activities that must be taken to prevent loss of human life or property. Please email or call me if you have questions concerning this response.

Thank you,
Jesse Wild

Jesse Wild, Senior Biologist
Conservation Planning, Endangered Species Division Sacramento Fish and Wildlife Office, U.S. Fish and Wildlife Service
2800 Cottage Way, W-2605, Sacramento, CA 95825
916-414-6670- direct 916-414-6600 main 916-414-6713 fax
jesse_wild@fws.gov

Landmark at the Ridge, Unit II, Neighborhood II – 6 Lots Site Activity Permit

County of San Mateo
Parks and Recreation Division
County Government Center
Redwood City, CA 94061

When completed fax to:
Thomas Reid Associates (TRA) (650) 327 – 4024
Sam Herzberg, San Mateo County (650) 599 – 1721

**SAN BRUNO MOUNTAIN
HABITAT CONSERVATION PLAN SITE ACTIVITY PERMIT**

<u>PROJECT:</u>	City of Brisbane, Northeast Ridge Vesting Tentative Map, Landmark at the Ridge, Unit II, Neighborhood II, 6 Lots on “B” Court and Silverspot Drive extension.
<u>LEAD AGENCY:</u>	City of Brisbane.
<u>PROPERTY OWNER:</u>	Brookfield Northeast Ridge II LLC.
<u>DATE:</u>	January 23, 2007.
<u>APPLICANT:</u>	Brookfield Homes.
<u>CONTACT PERSON:</u>	Kevin Pohlson.
<u>ADDRESS:</u>	500 La Gonda Way, Suite 100, Danville, Ca. 94526.
<u>TELEPHONE:</u>	925 – 743 – 8000.
<u>FAX:</u>	925 – 743 – 8050.
<u>EMAIL:</u>	Kpohlson@brookfieldhomes.com .
<u>HCP Administrative Parcel No.:</u>	Northeast Ridge Project (1 - 07).

Project Description:

The proposed development of 6 lots and homes is within the Landmark at the Ridge, Unit II, Neighborhood II (“Landmark II”) portion of the Northeast Ridge community, located within the San Bruno Mountain Area Habitat Management Plan (“HCP”). This proposed development includes the completion of the “B” Court lot pad grading that was disturbed in 1996, the completion of grading and installation of the “B” Court utility and roadway improvements as well as the grading and installation of utilities and paving within Silverspot Drive, a portion of which was disturbed in 1996.

Our intention is to complete the grading of lots 1 through 6 of the Landmark II neighborhood, which are in substantial conformance with the Northeast Ridge Vesting Tentative Map as approved by the City in 1989. We would also complete the grading and installation of permanent underground utilities and roadway improvements within “B” Court and Silverspot Drive, thereby providing the energized water system and paved roadway access required by the City of Brisbane (“City”) for fire suppression and emergency response activities.

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These grading, roadway and utility improvements, as well as riparian corridor, landscape and home construction, would complete all construction activity immediately adjacent to the existing Landmark II homes. The completion of this development would provide a paved buffer with an energized water system that separates the existing homes from the HCP open space, thereby allowing the local fire suppression agencies the ability to address any emergency action on public right – of – way that protects open space, persons, structures and properties. This development would also address the permanent drainage systems that the City would require for the provision of health, safety, property and welfare protection of the existing homes and open space.

The City Engineer has provided correspondence to the U.S. Fish and Wildlife Service (“US FWS”) regarding the City’s support of the immediate development of these 6 lots and roadway extensions. The City Engineer’s correspondence is attached as an exhibit to this permit application.

Equipment Required: Industry standard land development practices will be implemented, including but not limited to requiring large scale grading equipment, earthwork import equipment, utility trenching and backfill equipment, paving and concrete curb / gutter extrusion equipment and street light installation equipment. House construction will require standard production housing equipment, which includes but is not limited to concrete foundation equipment, framing and truss suppliers, roofing materials suppliers, lifting equipment and other onsite fabrication machinery similar to those used for the development of the previous Landmark at the Ridge homes already constructed within this community.

Personnel Required: Typical production housing and land development personnel will be required, which includes at least two onsite, full time Brookfield Homes’ personnel as well as 50 or more subcontractor personnel. Consultants and other field personnel will be onsite to review and observe construction activities during different stages of construction. City and Fire Authority personnel will also be onsite to inspect and approve the construction activities as well as issue certificates of occupancy upon the completion of the homes and accept the dedication of improved public right – of – way improvements.

Onsite Contact: Dave Heinke, (415) 656 – 1762.
Landmark at the Ridge, Superintendent.

Job Schedule: The land development improvements for the 6 lots and streets will include but not be limited to the completion of lot and street grading, the installation of all utilities and roadway improvements as well as the permanent drainage improvements at the basin adjacent to the 6 lots. The land development improvements could be completed by October 1, 2007 if the City allows grading to commence by June 1, 2007. The house construction activities would be completed by late Spring 2008. Note that the City will not commence plan check activities until a Site Activity Permit is issued.

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Scope of Impact to Habitat and Proposed Protective Measures:

The majority of the proposed 6 lot development, including the sedimentation pond and a portion of Silverspot Drive, was disturbed in 1996 and therefore the Site Activity Permit focuses on an area of limited construction impact. The proposed 6 lot development area actually reduces the permanent development envelope as approved in the 1989 City Modification to the Vesting Tentative Map and the 1990 H.C.P. Equivalent Exchange Agreement. The area of the proposed Silverspot Drive extension requires the greatest area of disturbance in order to complete the City required waterline, roadway and permanent drainage improvements, all necessary for the City Engineer to achieve health, safety and welfare protection for the existing homes and open space.

The extension of Silverspot Drive requires that an area of approximately 24,500 square feet be excavated so that both the roadway and drainage improvements could be completed. This is an extension of 120' – 0" at the maximum point and 70' – 0" average from the existing H.C.P. fence. The completion of the "B" Court cul – de – sac requires an area of approximately 7,400 square feet of fill, which is approximately 65' – 0" at the maximum point and a 30' – 0" average extension past the existing H.C.P. fence. The H.C.P. fence existing and revised locations are shown on the attached exhibit as well as the proposed cut and fill earthwork areas.

The westerly portion of the 6 lot "B" Court improvements would extend the H.C.P fence and be permanently improved and would not be subject to any further development activity upon completion of the 6 lot construction. This area would be dedicated to the homeowners' association for their maintenance of the vegetation and adjacent fire buffer areas. The area north of "B" Court where the sedimentation ponds exists as well as the Silverspot Drive area would be subject to future development activity once the balance of the Landmark II neighborhood occurred. The Silverspot Drive area disturbed as part of the 6 lot development would be revegetated and monitored by Brookfield Homes until such time as the construction of the remaining portion of Landmark II development was completed.

As the existing graded portion of "B" Court and Silverspot Drive have a temporary sedimentation pond that requires monitoring during storm events, the installation of permanent drainage improvements, including a revised sedimentation pond that flows away from the development and does not require storm event monitoring, will dramatically reduce the impacts of flooding and drainage upon the existing open space and existing homes. This will be a substantial benefit for the City and H.C.P. and will occur immediately after the completion of the 6 lot, "B" Court and Silverspot Drive grading activities.

Note that the existing sedimentation pond already extends well past the existing HCP fence and actually disturbs a portion of the westerly portion of the proposed 6 lot "B" Court permanent development area. The revised sedimentation pond would be shifted to an area that is already disturbed and be reduced in size, thereby reducing its impact upon

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the adjacent open space. The attached exhibit clarifies the location of the existing and revised sedimentation ponds.

The installation of the permanent underground drainage improvements as part of this proposal will add significant City controlled drainage protection to not only the existing and proposed homes but also to the adjacent open space, reducing potential impacts of erosion within this area. Note that all temporary drainage activities will be the responsibility of Brookfield Homes though under the direction of the City while the permanent public right – of – way drainage improvements will be implemented by the City.

Prior to the commencement of the development of the 6 lots and the roadway extensions, a new H.C.P fence shall be installed pursuant to the attached exhibits, being located a maximum of 30' – 0" away from the construction activities. In some cases, this fence might be located closer than 30' – 0" from the construction activity as no further construction activity in this area would be required.

Erosion control measures as well as dust control measures will be implemented pursuant to City standards. In fact, all City and HCP standards for land development and home construction activities will be in place prior to and during the construction of this proposed development. This includes an energized City water system and paved roadways prior to the commencement of house construction as well as drainage and erosion control improvements in place prior to October 1, 2007 subject to the City Engineer's direction.

These 6 lots will fund their share of the HCP annual assessments as well as the HCP Endowment that is being discussed as part of the HCP Amendment. Pursuant to an agreement with the City, the HCP Assessment would be revised to be \$800.00 per home annually and be funded through the Association's collection of the assessments after the issuance of the certificate of occupancy for the home, which is the same method that occurred for the Unit I homes in the Northeast Ridge. The HCP Amendment's proposed HCP Endowment funding, which is \$45,454,55 per home, would be funded by Brookfield Homes to the City at the time of the issuance of each building permit. The City would then contribute these funds to the HCP Trustees for their use in funding the HCP Amendment revised management measures.

Applicant's Signature / Title:

Kevin Pohlson, V.P. of Land and Planning.

Property Owner's Signature:

Kevin Pohlson, V.P. of Land and Planning.
Brookfield Northeast Ridge II LLC.

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FOR STAFF USE ONLY

PERMIT VALID UPON APPROVAL BELOW

County Contact: Patrick Kobernus, TRA Phone: 650-269-3894

Conditions of Approval: Inform TRA and San Mateo County when work is completed.

1) *Prior to initiation of the work, conduct a preconstruction meeting on site with the Habitat Manager.*

Signature /  Title: Habitat Manager
Date: 2/1/2007

Note: Use Additional Pages for Further Description.

This permit does not absolve applicant of responsibility to obtain all other applicable permits; this permit grants HCP Habitat Manager approval to projects within the San Bruno Mountain HCP. Other permits may vary.