ADOPTION AND IMPLEMENTATION OF SAN BRUNO MOUNTAIN HABITAT CONSERVATION PLAN AND ENDANGERED SPECIES ACT SECTION 10(a) PERMIT

FINAL
ENVIRONMENTAL IMPACT REPORT
AND ENVIRONMENTAL ASSESSMENT

NOVEMBER 1982

COUNTY OF SAN MATEO
AND
UNITED STATES DEPARTMENT OF INTERIOR,
FISH AND WILDLIFE SERVICE

ADOPTION AND IMPLEMENTATION

OF

SAN BRUNO MOUNTAIN HABITAT CONSERVATION PLAN

AND

ENDANGERED SPECIES ACT SECTION 10(a) PERMIT

FINAL

ENVIRONMENTAL IMPACT REPORT

AND

ENVIRONMENTAL ASSESSMENT

NOVEMBER 1982

COUNTY OF SAN MATEO
AND
UNITED STATES DEPARTMENT OF INTERIOR,
FISH AND WILDLIFE SERVICE

TABLE OF CONTENTS

I. SUMMARY

I. SUMMARY OF COMMENTS AND RESPONSES

Four sets of written comments were received on the Draft EIR/EA: two from governmental agencies and two from private citizens. The California Department of Forestry (CDF) clarified the fire attack policy on San Bruno Mountain with regard to protecting both public and CDF personnel safety. The U.S. Environmental Protection Agency wanted more specifics on the indirect impacts on air quality of the development associated with the HCP. The private citizens voiced concerns about the uncertainties involved in implementing the Habitat Conservation Plan (HCP), and about the lack of supporting evidence that the Plan will work. Oral comments were made both during the Planning Commission public hearing on August 25, 1982 and during the Board of Supervisors hearing on September 14, 1981. Several speakers addressed the HCP, but no comments were made on the EIR/EA.

In responding to the concerns of the private citizens, it should be noted that the grassland species, particularly the Mission Blue butterfly, are well suited to the types of enhancement measures discussed in the Plan. For example, the host plants of the Mission Blue are known to flourish in disturbed areas on the Mountain.

Nonetheless, it is clear that many aspects of the Plan are experimental in nature, and that there is some risk that the plan will not work as expected. However, the grassland community and the population of Mission Blue are already subject to real risk of loss.

The HCP is directed at the present biological and land use planning problems that affect San Bruno Mountain. The fundamental thrust of the HCP is to resolve land use conflicts so as to achieve effective and maximum conservation of the unique ecological features of San Bruno Mountain. One goal is to enhance the survival of the listed endangered Mission Blue. The tools to accomplish this goal are the conservation of what is now private land, control of activities on SBM, control of exotic species, and habitat reclamation. The Plan provides for funding, enforcement, monitoring, and research. The research component is included as a way to make the enhancement more effective.

The principal uncertainty is timing for enhancement. It is known that the habitat can be re-established from observations of SBM's response to over a century of man's disturbance. The question is not <u>whether</u>, but <u>when</u> the habitat can be enhanced beyond its present day condition. The HCP permits development which will cause the loss of roughly one-seventh of the habitat for the Mission Blue over a period of about five to eight years. The enhancement program will begin immediately, but it will require some ten to fifteen years to produce the extent of mature host plants needed to be effective.

The gap between short term impact and long term enhancement represents the principal risk of the plan. The risk appears both reasonable based on the scientific evidence, and unavoidable, because the development is the source of the private land to be conserved and the funding for plan operation.

In all, considering the biological requirements of the species of concern and of the ecological communities, considering the limited capacity for

further public purchase of open space, considering the long standing land use plans of the land owners and of the surrounding jurisdictions, and considering the extent of past damage and the present threat to habitat, the Habitat Conservation Plan represents the most effective and responsible course of action to preserve the unique ecological communities of San Bruno Mountain.

II. COMMENTS

COUNTY OF SAN MATEO

INTER-DEPARTMENTAL CORRESPONDENCE

DATE July 21, 1982

TO: William Rozar, Planner III

FROM: Steve Kroeger, State Forest Ranger I
Fire Protection Planning

SUBJECT: San Bruno Mtn. Habitat
Conservation Plan
Draft EIR

Thank you for sending us the above referenced document. Our staff has reviewed the project and has the following comments.

For the most part we agree with the report and the information provided by Dan Dyer of the Department of Forestry is still accurate. We do, however, have a problem with Section 3, Primary Impacts.

(1) At the top of Page III-39, the report states that the Dept. of Forestry's fire attack policy on inaccessible fires is governed by location in regards to sensitive areas or BAAQMD regulations. In fact, the strength of any fire attack by the Department is based not only on the values involved, but also on the difficulty of control and safety of personnel. It is the policy of this Department to contain all fires as soon as possible and to allow the smallest acreage to be burned. However, personnel safety cannot be sacrificed in the interest of environmental concerns.

We are quite willing to cooperate with all agencies concerned with habitat conservation and air quality, but we are unable to sacrifice the safety of our firefighting crews and/or the general public.

In several places in the document the "Division" of Forestry is referred to. In 1977 this agency gained Departmental status and should be referred to as the "Department" of Forestry.

If you have any questions, please contact me at 345-1612 or 592-2726

SK/ih

1730A Jones Street
San Francisco, Ca 94109
July 20, 1982

For: Wm. Rozar, San Mateo County Planning Division
590 Hamilton St, Redwood City, Ca 94063

Re: Comments on DEIR, San Bruno Mt. Habitat Conservation Plan.

The Habitat Conservation Plan (HCP) and DEIR are seriously deficient and need to be reissued with:

(2) (1) Full discussion of the tax write-off alternative to development whereby the donation of land to a public or non-profit agency benefits landowners by an appropriate reduction in taxes (conservation easement or donation, etc.).

The assumption that public purchase is REQUIRED is a fundamental weakness in both documents.

(3) The assumption that landowners and government agencies alike will allow the land to deteriorate should be viewed as an insult to each group. Some kinds of deterioration appear to be illegal and subject to public nuisance laws (ORV use). There are also legal remedies and fines for the destruction of species (habitat).

(4) (2) Two seasons of weekly field surveys for rare and endangered grassland plants in flower needs to be incorporated into a revised DEIR.

(5) (3) The DEIR sould contain a description of the goals of the ESA.

The developments the San Bruno Mt. DEIR serve threaten the extinction of one or more species. San Bruno Mt. is a unique biological haven in an immense urban landscape. This steep barren looking enclave has a most remarkable number of plants and animals which are endangered and rare.

It is an obligation of of each of us - public official, landowner, citizen - to acknowledge and help save biological diversity. The future benefits to science, medicine or agriculture from any one plant or animal cannot be judged by anyone. The connection of one species to the whole is unseparable.

(6) Is it scientifically valid to describe as a 'short term loss' the use of 13% of Mission Blue habitat and 7% of the Checker Spot habitat for residential/commercial development?

(7) A responsible official could not issue a Section 10a Permit for 'taking' under the ESA for the reasons given - that is, that destruction of significant habitat is a 'benefit' - or so says the DEIR. The reasoning is tortured and unacceptable.

continued ...

A few specific questions:

(8) 1. Is the County to bear the cost of all landscape maintenance outside the building envelope? The $60,000 fund would hardly cover such a situation. (Page 1-12)

(9) 2. Is the 30 ft. buffer zone calculated in the destroyed habitat calculation? How much would that amount to? (Page 1-12)

(10) 3. A stop-work order to be effective should carry with it fines of $100 to $100,000 including the full costs for private/public action bringing the stop work order. (I-11)

(11) 4. There are 11 or more Rare and Endangered flowering plants on San Brunto Mt. of which 6 are specific to rocky outcrops or grasslands. How often were the development sites visited by botanical experts during the flowering period of each of these rare plants? Shouldn't this be a two year survey at least because plants may skip years in terms of blooming?

Such sites need to be surveyed assessed/weekly during the known flowering period of the plants for any kind of complete report as to whether one or more of these plants may be present.

(12) The HCP can represent a plan for further study and immediate action to conserve the scientific values of San Bruno Mt. Use of grading, chaining and herbicides seem most inappropriate techniques and alternatives must be found - and, of course, are available in hand removal of obnoxious invasive plants like gorse. University participation and foundation funding must be sought to help carry out a better plan in a better way.

Thank you for including these views . I urge you Mr. Rožar to correct the obvious deficiences in the DEIR and HCP and reissue these to the public for further comment. The public should not be asked to comment on documents so seriously flawed in terms of underlying assumptions concerning alternatives to public purchase (government funding), and concerning questionable values and benefits assigned to habitat destruction.

Sincerely yours,

Susan M. Smith

Susan M. Smith
1730A Jones Street
S.F./Ca 94109

1974-8188

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION IX
215 Fremont Street
San Francisco, Ca. 94105

SAN MATEO COUNTY
PLANNING DIVISION
RECEIVED
AUG 19 1982

Mr. William Rozar
San Mateo County Planning Division
590 Hamilton Street
Redwood City, California 94063

18 August 1982

Dear Mr. Rozar:

The Environmental Protection Agency (EPA) has received and reviewed the Draft Environmental Impact Report/Environmental Assessment for the SAN BRUNO MOUNTAIN HABITAT CONSERVATION PLAN. We have the attached comments to offer for your consideration.

We appreciate the opportunity to review this EIR/EA and request three copies of the final document when available. If you have any questions regarding our comments please contact me at (415) 974-8188.

Sincerely yours,

Loretta Kahn Barsamian

Loretta Kahn Barsamian, Chief
EIS Review Section

Attachment

cc: Mr. Richard J. Myshak
U.S. Fish & Wildlife Service - Portland

Air Quality Comments

The Draft EIR/EA adequately describes the direct air quality impacts of the proposed action. Indirect impacts, however, (13) are not adequately described. The statement on p. IV-16 that the "cumulative impact of all projects on air quality will be a degradation of both local and regional air quality caused by increased vehicular traffic" is much too general for projects of the magnitude indicated in an area (the Bay Area) which has already been designated as a Nonattainment Area for ozone and carbon monoxide.

The Final EIR/EA should describe the total emissions (CO, NO_x, HC) resulting from the development, including vehicular traffic, power generation, and structural heating/cooling. It should further describe the impact such emissions would have upon local and regional air quality, employing air quality modeling where necessary. The likelihood of violations of air quality standards due to such emissions should be assessed in the Final EIR/EA.

The Bay Area Air Quality Management District, the Association of Bay Area Governments, and the Metropolitan Transportation Commission should be consulted to determine if the growth resulting from the total development has been accounted for in the Bay Area Nonattainment Area Plan. The Final EIR/EA should contain a statement as to the results of that consultation: Is the development consistent with the Plan?

ELIZABETH MC CLINTOCK
1335 UNION STREET
SAN FRANCISCO, CALIFORNIA 94109

August 19, 1982

Mr. William Rozar
San Mateo County Planning Division
590 Hamilton St.
Redwood City, CA 94063

Dear Mr. Rozar:

Re: Comments on San Bruno Mountain Habitat Conservation Plan and Draft Environmental Impact Report/Environmental Assessment

(14) There is no good valid evidence in these reports to show that the species of concern, the two butterflies, would really benefit from the Habitat Conservation Plan. There are only assumptions that this benefit would occur.

The primary purpose of the plan is to conserve these butterflies and it proposes to do it through the four steps mentioned on p. S-1 of the DEIR-EA.

The loss of the 370 acres of open space on San Bruno Mountain, which comprise the small percentages (13% and & 7%) of the habitats of the butterflies, and on which will be built 3021 new dwelling units, 405,000 square feet of office space, 400,000 square feet of commercial space, a 400 room hotel, and additional recreational and community facilities. These diverse developments will bring hundreds of new full time and part time residents into the area, and hundreds more day time users of office and commercial space. In other words this development would become as much of an urban area--although smaller to be sure--as that presently surrounding San Bruno Mountain, in fact it would simply become a part and blend in with the already developed area.

It was urbanization which did away with the habitats of the two butterflies in the presently urbanized area of the San Francisco Peninsula and led to their eventual survival in the refuge provided by the open space of San Bruno Mountain.

The proposed urbanization of San Bruno Mountain would gradually do away with the now rare butterflies in their present habitats in spite of the elaborately designed mitigating measures. The now rare butterflies would not be able to survive, any more than those butterflies at one time more widespread survived the larger urbanization of the San Francisco Peninsula. One urbanized area is not that different from another.

Some organisms are more sensitive to urbanization than others and these two butterflies apparently are among such sensitive ones. They are part of a complex ecosystem which has evolved over eons of time but they cannot survive major short term catastrophic environmental changes. Their extinction from the now urbanized San Francisco Peninsula has demonstrated that fact.

The developers of San Bruno Mountain and the various agencies, both local and federal, would like to believe that they can save the butterflies and have the development, too, by carrying out their Habitat Conservation Plan. The least we can say is that they are trying. The butterflies will be remembered along with the Furbish lousewort and the snail darter, although for somewhat different reasons.

The point to remember is that the development on San Bruno Mountain is just one of many taking place not only in California but elsewhere as well. All are gradually eliminating plants and animals--rare or not. Eventually all of the developments will be completed along with the demise of most--if not all--plants and animals. With these resources gone, man will then be eliminated also. Man cannot survive on concrete and a few monocultures.

Very truly yours,

Elizabeth McClintock

Elizabeth McClintock

III. RESPONSES

RESPONSE TO COMMENTS
HABITAT CONSERVATION PLAN/SECTION 10(a) PERMIT
ENVIRONMENTAL IMPACT REPORT/ENVIRONMENTAL ASSESSMENT

1. From: Steve Kroeger, State Forest Ranger I

Comment: At the top of Page III-39, the report states that the Dept. of Forestry's fire attack policy on inaccessible fires is governed by location in regards to sensitive areas or BAAQMD regulations. In fact, the strength of any fire attack by the Department is based not only on the values involved, but also on the difficulty of control and safety of personnel. It is the policy of this Department to contain all fires as soon as possible and to allow the smallest acreage to be burned. Hovever, personnel safety cannot be sacrificed in the interest of environmental concerns.

Response: The Department's fire policy regarding inaccessible fires is that the safety of the Department's personnel and the public cannot be sacrificed at any cost. Therefore, the statement on the top of Page III-39 of the EIR should be restated to say "if accessible, fires on SBM are contained as soon as possible, otherwise they are allowed to burn until a ridge or fire break is reached, unless there is difficulty with with control or the fire fighter's or the public's safety is in jepardy. The HCP will not interfere with this policy.

2. From: Susan M. Smith, Citizen

Comment: The HCP and DEIR are seriously deficient and need to be reissued with: Full discussion of the tax write-off alternative to development whereby the donation of land to a public or non-profit agency benefits landowners by an appropriate reduction in taxes (conservation easement or donation, etc.).

Response: This comment suggests that an alternative to the HCP might entail the contribution of all land on the SBM to a public agency to be conserved as open space. This comment suggests that the beneficial tax consequences associated with this contribution might exceed the income to be derived from the planned development. A review of the applicable law in this area indicates that this is not the case. The Internal Revenue Code provides a deduction for any charitable contribution made within a taxable year. In general, where property rather than cash is contributed, the amount of the deduction is the fair market value of the property. Deductions, of course, only reduce the amount of taxable income. They do not directly reduce the level of tax liability. In the case of charitable contributions by a corporation, Section 170(b)(2) of the Internal Revenue Code limits the deductions to 5% of the corporation's taxable income for the taxable year. To the extent charitable contributions exceed this 5% limitation in any taxable year, a code provides that they made be carried over and deducted from income from the 5 succeeding taxable years. The internal revenue code imposes further limitations and deductions arising from contributions of property rather than money. In general, these limitations require that the amount of the charitable contributions arising from the contributions of either ordinary income, property, or capital gain, may be reduced by the amount which the contributor would have taken in income if the contributed property had been sold at its fair market value (Internal Revenue Code, Section 170(e)).

It appears then, that the Internal Revenue Code places a number of limitations on charitable deductions of land and that as a result it appears very unlikely that the tax consequences associated with a charitable contribution of the privately held property within the SBM area would approach either the fair market value of the land or the income which would be derived from development activities within the area.

3. From: Susan M. Smith, Citizen

Comment: The assumption that landowners and government agencies alike will allow the land to deteriorate should be viewed as an insult on each group. Some kinds of deterioration appear to be illegal and subject to public nuisance laws (ORV use). There are also legal remedies and fines for the destruction of species (habitat).

Response: It is true that illegal activities causing deterioration of the habitat (such as ORV and rubish dumping activities) are subject to police enforcement. Currently there are two rangers assigned to the County Park portion of SBM. One of their many duties include citing illegal off road vehicle riders. It is difficult for the rangers to cite many of the riders because their work trucks cannot access the areas where the cyclists ride. In addition, the rangers only enforce within the park boundaries, not on the 42% (proportion of the land) that is not now in public ownership. On the private lands city police and sheriffs officers patrol the area for illegal ORV and rubish dumping activity. Recently, the San Mateo County Sheriffs Department has budgeted for a motorcycle team whose main purpose is to stop ORV activities on County lands (County sheriff's Dept., pers. comm., Jan 1982). Due to the intensity of the activity during certain times of the year, the limited budget available for this type of enforcement, and the large areas to be covered by the officers, all of the activity cannot be stopped.

Of particular importance is the fact that both the city police and County Sheriff's departments are deployed to patrol a much larger area, and to carry out many more activities than vandalism control on San Bruno Mountain. Their present force and budget cannot possibly allow them an equal efficacy of control as the Habitat Manager under the HCP. This individual and his assistants will have the power of enforcement, and will be physically present on those areas of the mountain and during those periods where the ordinary public enforcement agencies are virtually unable to act.

Legal Remedies and Fines for Destruction of Species

San Mateo County, at present, has no jurisdiction to enforce the ESA as it relates to the destruction of species on San Bruno Mountain (Bill Rozar, pers. comm.)., and although there is an investigative branch of the Fish and Wildlife Service in Burlingame, which responds of violations of the Endangered Species Act, there are no Federal or State enforcement officers patrolling the Mountain at present (Ralph Swanson, pers. comm.). Once the HCP is in effect, however, San Mateo County will have the authority to enforce the ESA.

Public agency weed abatement

As to the question of habitat deterioration caused by the spread of exotic invasive species (such as Gorse, fennel, scotch broom, etc.), there are

little governmental incentives for controlling exotic species spread. Daly City does have a weed abatement program which calls for the removal of weeds (including Gorse) within a 100 feet of the house (Mike Simms, pers. comm., 4/2/82). In addition, the San Mateo County Parks and Recreation Department has plans to eradicate areas exotic species within the Park boundaries (Harry Dean, pers. comm.). Their plans, however, do not include determining the most effective means to remove the species, or determining a reseeding program which will most benefit the species of concern, as does the HCP.

4. From: Susan M. Smith, Citizen

Comment: Two seasons of weekly field surveys for rare and endangered grassland plants in flower needs to be incorporated into a revised DEIR.

Response: Please see the response to Comment #11.

5. From: Susan M. Smith, Citizen

Comment: The DEIR should contain a description of the goals of the Endangered Species Act (ESA).

Response: Section 2(b) of the Endangered Species Act of 1973 states that "the purposes of this Act are to provide a means whereby the ecosystems upon which endangered species and threatened species depend may be conserved, to provide a program for the conservation of such endangered species and threatened species, and to take such steps as may be appropriate to achieve the purposes of the treaties and conventions set forth in subsection (a) of this section". Subsection (a) reads as follows:

"Section 2. (a) FINDINGS. The Congress finds and declares that -

(1) various species of fish, wildlife, and plants in the United States have been rendered extinct as a consequence of economic growth and development untempered by adequate concern and conservation;

(2) other species of fish, wildlife, and plants have been so depleted in numbers that they are in danger of or threatened with extinction;

(3) these species of fish, wildlife, and plants are of esthetic, ecological, educational, historical, recreational, and scientific value to the Nation and its people;

(4) the United States has pledged itself as a sovereign state in the international community to conserve to the extent practicable the various fish or wildlife and plants facing extinction, pursuant to-

(A) migratory bird treaties with Canada and Mexico;
(B) the Migratory and Endangered Bird Treaty with Japan;
(C) the Convention on Nature Protection and Wildlife Preservation in the Western Hemisphere;
(D) the International Convention for the Northwest Atlantic Fisheries;
(E) the International Convention for the High Seas Fisheries of the North Pacific Ocean;
(F) the Convention on International Trade in Endangered Species of Wild Fauna and Flora; and
(G) other international agreements.

(5) encouraging the States and other interested parties, through Federal

financial assistance and a system of incentives, to develop and maintain conservation programs which meet national and international standards is a key to meeting the Nation's international commitments and to better safeguarding, for the benefit of all citizens, the Nation's heritage in fish and wildlife".

Finally, it is the ESA's policy "that all Federal departments and agencies shall seek to conserve endangered species and threatened species and shall utilize their authorities in furtherance of the purposes of this Act".

6. From: Susan M. Smith, Citizen

Comment: Is it scientifically valid to describe as a 'short term loss' the use of 13% of Mission Blue habitat and 7% of the Callippe Silverspot habitat for residential/commercial development?

Response: Yes. As was stated on p. IV-1 of the HCP and VIII-1 of the Plan Environmental Document the term 'short term loss' is only understood in the context of its counterpart, the long term gain brought about by the conservation provisions of the HCP, including the permanent dedication of habitat to conservation, the careful and controlled restoration of currently degraded habitat equal to or greater than the area lost to development, and the prevention of further loss of grassland habitat to brush invasion. The loss is felt to be short-term because the overall extent of habitat lost is small enough that the populations of Mission Blue and Callippe Silverspot would probably not go extinct on the Mountain simply by virtue of the habitat area lost to development, and the conservation activities of the Plan are anticipated to counteract this loss within the same (5 to 10 year) time frame of the loss itself.

7. From: Susan M. Smith, Citizen

Comment: A responsible official could not issue a Section 10a Permit for 'taking' under the ESA for the reasons given - that is, that destruction of significant habitat is a 'benefit' - or so says the DEIR. The reasoning is tortured and unacceptable.

Response: The reader shows the same misunderstanding of the Plan as was indicated in Comment #6. In particular, the destruction of significant habitat is obviously not a benefit to the species, but the development mitigation and conservation activities are the benefit which, on the basis of valid scientific evidence, are believed to more than compensate for this loss of habitat.

8. From: Susan M. Smith, Citizen

Comment: Is the County to bear the cost of all landscape maintenance outside the building envelope? The $60,000 fund would hardly cover such a situation. (p. I-12)

Response: First of all, it is important to define what is meant by the building envelope. The building envelope includes all buildings, development related landscaping, roads, and the 30 foot buffer area

surrounding the development. The developer, and later the homeowner's associations, will be responsible for maintaining the landscaping within this area up to the outer edge of the buffer zone. The Plan Operator will be responsible for maintaining the conserved habitat areas outside of the building envelope.

Secondly, as described on Page III-27, under Economics of Plan Operation, the funding is divided into three phases: start up, construction phase, and permanent funding. The purpose of the start up funding (25,000* annually to be contributed by the developers) is to assure that the plan operation is in place and that the habitat manager is available to monitor pre-construction activities and to proceed with priority enhancement. The construction phase funding, which will also be provided by the developers as their individual projects begin, will pay the costs of having the habitat manager monitor the construction acitvities and will also pay the costs of doing habitat enhancement (e.g. exotic species control) in the developers entire parcel.

As individual developments are completed the permanent funding will begin. This funding, estimated to be over 60,000 annually once all development is completed, will cover the costs of guaranteeing that the plan is in operation, by maintaining the necessary personnel, and will provide for a low scenario enhancement program. This permanent funding will be paid for by the individual owners of the dwelling units and the owners of the commercial development.

* this amount has recently increased to $50,000 per year.

9. From: Susan M. Smith, Citizen

Comment: Is the 30 foot buffer zone calculated in the destroyed habitat calculations? How much would that amount to? (p. I-12)

Response: The 30 foot buffer zone is included in the calculation of the amount of habitat permantly lost to development. The buffer zone is intended to act as a fire break and its design will be approved by the appropriate City's fire marshall. An exact calculation of the amount of land used in each development's 30 foot buffer zone was never made.

10. From: Susan M. Smith, Citizen

Comment: A stop-work order to be effective should carry with it fines of $100 to $100,000 including the full costs for private/public action bringing the stop work order. (p. I-11)

Response: Currently neither the County nor the relevent cities have the legal authority to levy fines with regard to stop work orders. It is possible to provide for this specifically in the HCP by making it a condition; however as the Plan now suggests, the pressure brought about by the delays caused by the stop work order will encourage the developer to conform to the HCP conditions. In addition, violations resulting in stop work orders may result in requiring reclamation of the improperly graded areas, donation of undisturbed habitat equivalent to that improperly graded, forfeiture of bond by revocation of the grading permit, etc. Each of these also put a financial

burden on the developer equal to or greater than the payment of a fine.

11. From: Susan M. Smith, Citizen

Comment: There are 11 or more Rare and Endangered flowering plants on San Bruno Mt. of which 6 are specific to rocky outcrops or grasslands. How often were the development sites visited by botanical experts during the flowering period of each of these rare plants? Shouldn't this be a two year survey at least because plants may skip years in terms of blooming? Such sites need to be assessed/surveyed weekly during the known flowering period of the plants for any kind of complete report as to whether one or more of these plants may be present.

Response: During the 1980-81 field work for the Endangered Species Survey on San Bruno Mt. several well-known botanists familiar with San Bruno Mountain were consulted as to the presence of rare and endangered plants on the Mt. No actual field surveys were done in 1980 due to the passage of the flowering season for the species of concern. However, in 1981 several field searches were done. Please refer to Table V-3 in the Endangered Species Survey for a listing of these. The primary thrust of these searches was to locate three rare grassland plant species, Silene verecunda, Orthocarpus floribundus, and Helianthella castenea which were specifically chosen for detailed survey because of the greater likelihood that they occurred in development areas. Other rare and endangered plants either had very well documented locations (i.e. the Arcostaphylos species), were common on the Mountain (i.e. Arabis blepharophylla, Erysimum franciscanum), or were not grassland species.

Since these individuals -- Elizabeth McClintock and Walter Knight, authors of The Flora of the San Bruno Mountains, Californias, and Kathryn Culligan of CNPS were quite knowledgeable of both the distribution of plant habitats on SBM and of the species of concern, their opinion regarding the probable occurrence of these plants was taken as highly credible. In their opinion, the survey conducted in spring, 1981 was sufficient to establish the probable extirpation of the Silene and Orthocarpus and possibly all three species. While it is true that the species might reappear in a subsequent survey, first of all, the probability that weekly surveys would be more accurate than the two or three surveys for each plant conducted to span the flowering season is low. Secondly, the reappearance of the species could be due to the failure of the annual Orthocarpus to germinate (unlikely for the two perennials) in the 1981 survey year, or to recolonization from off the Mountain (see Table V-2 of the Biological Survey for Endangered Species) for other locations of these species. Thirdly, based on the habitat preference of each plant, should the plants still exist, or re-colonize the Mountain, the Plan Environmental Document (p. III-16) discusses both the probable impact of development on these species, and the specific measures incorporated to protect them in the future.

12. From: Susan M. Smith, Citizen

Comment: The HCP can represent a plan for further study and immediate action to conserve the scientific values of San Bruno Mt. Use of grading, chaining, and herbicides seem most inappropriate techniques and alternatives must be found - and, of course, are available in hand removal of obnoxious invasive

plants like gorse. University participation and foundation funding must be sought to help carry out a better plan in a better way.

Response: This issue is specifically discussed on p. III-24 of the Enviromental Document. Grading, chaining, and scraping, are suggested as a means to eradicate exotic invasive species which are too tough to remove by hand. Gorse which is very spiny and difficult to remove by hand may be most effectively removed by being scraped and burned. A goal of the HCP is to experiment with various techniques of exotic species removal on a small scale to determine the methods least harmful to species of concern, and most cost effective. Herbicides are suggested only as a means to eradicate exotic species seedlings and again, will be tried on an experimental scale at first. In addition, they will be applied only by hand, and not aerial spray and will not drift from the application site. Pesticide restrictions on development specifically forbid wanton application of pesticides or herbicides by future homeowners. Research into other methods of exotic species control will be done as part of the HCP.

To the greatest degree possible, the Plan Operator should solicite university participation in the implementation of the Plan. Foundation and other supplemental funding could help increase the basic funding level so that the basic provisions of the Plan are exceeded.

13. From: US Environmental Protection Agency

Comment: The Draft EIR/EA adequately describes the direct air quality impacts of the proposed action. Indirect impacts, however, are not adequately described. The statement on P. IV-16 that the "cumulative impact of all projects on air quality qill be a degradation of both local and regional air quality caused by increased viehicular traffic" is much too general for projects of the magnitude indicated in an area (the Bay Area) which has aready been designated as a Nonattainment Area for ozone and carbon monoxide.

The Final EIR/EA should describe the total emissions (CO, NOx, HC) resulting from the development, including vehicular traffic, power generation, and structural heating/cooling. It should further describe the impact such emissions would have upon local and regional air quality, employing air quality modeling where necessry. The likelihood of violations of air quality standards due to such emissions should be assess in the Final EIR/EA.

The Bay Area Air Quality Management District, the Association of Bay Area Governments, and the Metropoitan Transportation Commission should be consulted to determine if the growth resulting fromhe total development has been accounted for inthe Bay Area Nonattainment Area Plan. The Final EIR/EA should contain a statement as to the results of that consultation: Is the development consistent with the Plan?

Response: We consulted Sally Freedman at BAAQMD and Ron Wada at ABAG. We were informed that MTC's planning function is included in ABAG's Projection '79. Information from that document reveals that the development of 3,000 units, housing roughly 8,000 people, on San Bruno Mountain will exceed the total population estimate of 1,037 projected by the Association of Bay Area Governments (ABAG) for the year 2000. We were informed by Mr. Wada, however, that it is clear to ABAG that these projections are now out of date. The site

is located near cities that experienced growth several decades ago and very slow growth in recent times. Demographic projections based on recent data fall below the level of population increase that would result from a major project on SBM.

It is important to note, with regard to air quality, that the development of the Mountain represents urban infilling rather than expansion at the periphery of the urban area. Urban infilling localizes impacts to air quality and promotes reduced use of automobiles because peoples' needs are generally met closer to existing housing. In addition, the housing in San Mateo County serves to improve the imbalance between jobs and housing on a regional scale; the County provides needed local housing to neighboring San Francisco and Santa Clara Counties which support a greater number of jobs. In this way, the commute distance between home and work may be reduced for some employees.

Since the Bay Area is already a Nonattainment Area for carbon monoxide and ozone, added development would most likely cause further exceedence of current air quality standards for these pollutants. The major increases in carbon monoxide, nitrogen oxide and hydrocarbons will stem from increased vehicular traffic in connection with development. 21,270 average daily trips resulting in a total of 176,500 vehicle miles traveled per day (Wilbur Smith Associates) will cause several thousand pounds of these pollutants to be emitted every day: roughly 39,000 lbs of carbon monoxide, 3500 lbs of hydrocarbons, and 4400 lbs of nitrogen oxide (calculated using factors developed by the California Air Resources Board, 3/81, based on EPA's MOBILE2, 12/80). These emissions will of course represent an overall degradation of the existing air quality; the degree of degradation depends on the conditions experienced on any single day ie., the weather, output of other emissions sources.

The air quality impacts of each project have been discussed in the EIRs now completed for the individual projects. Mitigation measures are suggested here for implementation into the final design of projects on the Mountain if they have not already been accounted for. These include measures which reduce vehicle usage, such as provision for increased public transit, a network of bicycle paths, and preferential treatment of carpools, and measures which reduce power generation, such as increased use of solar or other power which emits a lesser amount of pollutants. Major employers are encouraged to commit to a transportation program within the company which promotes ride-sharing among employees. The Air Resources Board is currently working on a ride-sharing ordinance which adresses this issue.

14. Elizabeth McClintock

Comment: There is no good valid evidence in these reports to show that the species of concern, the two butterflies, would really benefit from the Habitat Conservation Plan. There are only assumptions that this benefit would occur.

Response: The type of scientific evidence which would <u>prove</u> the HCP was successfully conserving and restoring habitat and that the butterfly populations were stable would come from several decades of actual Plan operation. The conservation activities of the Plan are not available without the initial development phase for several important reasons:

(1) Without the development approval there will be no input of funds required to run even small-scale pilot studies to test the effectiveness of particular habitat improvement measures. The development is a critical element of the Plan's success since it insures an adequate level of funding in perpetuity to conduct it.

(2) As discussed in the DEIR/EA, the option of no development, in the absence of habitat management measures (such as gorse control) there is high probability that the habitat of the butterflies will continue to be lost at a rapid rate due to the action of natural (not human) processes. The rate of spread of gorse, eucalyptus, and other brush is well documented in the HCP (Chapter 3) and Biological Study (Chapter 6) and has included many areas of the Mountain beyond those affected by the spread of Ceanothus after the 1964 fire. In other words, there is good scientific evidence that processes are now at work resulting in loss of grassland habitat.

(3) In the opinion of the scientific reviewers who read the Biological Study (copies of letters on file with P. Koenig), the degree of habitat loss caused directly by development is not alone likely to be responsible for the extinction of the endangered butterflies on SBM since other organisms in other locations have been observed by scientific researchers to suffer this (and greater) levels of habitat reduction without long-term population demise (see Chapter 6 of the Biological Study, discussion of island biogeography).

In summary, the Plan is the best option we have to work with at present. In the real world it is often not possible to have positive proof of the benficial (or of the lack of adverse) effects of important actions before proceeding with these actions. It is the opinion of the scientific reviewers and others who have read the documents that the Biological Study itself is thorough, comprehensive, and scientifically valid enough to serve as the basis for the plan as currently proposed and that this scientific evidence strongly suggests that the Plan will work.

IV. RESOLUTION

RESOLUTION NO. 43779

BOARD OF SUPERVISORS, COUNTY OF SAN MATEO, STATE OF CALIFORNIA

* * * * * * * *

RESOLUTION ADOPTING THE HABITAT CONSERVATION PLAN
FOR SAN BRUNO MOUNTAIN AND CERTIFYING THE
ENVIRONMENTAL IMPACT REPORT AND ENVIRONMENTAL ASSESSMENT

RESOLVED, by the Board of Supervisors of the County of San Mateo, State of California, that

WHEREAS, the Environmental Impact Report/Environmental Assessment is complete, correct and adequate, and prepared pursuant to CEQA and all appropriate State and local guidelines; and

WHEREAS, this Board desires to set forth those facts which it believes override the significant adverse impacts pursuant to California Administrative Code Section 15089 and information in the record:

NOW, THEREFORE, THIS BOARD FINDS

1. That there are significant unavoidable adverse impacts associated with the approval of the Endangered Species Act Section 10(a) Permit, to wit: (1) the taking of endangered species, (2) air quality degradation, (3) traffic, and (4) visual impacts; and
2. That after weighing the evidence that the housing shortage in San Mateo County is significant and that the development allowed by the approval of the Endangered Species Act Section 10(a) Permit will provide a significant number of new housing units and overrides the significant impacts.
3. That the Habitat Conservation Plan does not completely mitigate the loss of endangered species but reduces such loss to an acceptable level when balanced against the social benefits of the proposed developments.

4. That the Endangered Species Survey for San Bruno Mountain, incorporated herein by reference, is the basis upon which the Habitat Conservation Plan was formulated.

5. That the Habitat Conservation Plan enhances the long-term survival of the endangered species affected by the Endangered Species Act Section 10(a) Permit, i.e., the Mission Blue butterfly (Pegejus icarioides missionensis) and indirectly the Callippe Silverspot (Speyeria callippe callippe) as well as other species of concern.

NOW, THEREFORE, BE IT RESOLVED that this Board of Supervisors hereby:

1. Certifies the Environmental Impact Report as complete, correct and adequate and prepared pursuant to the California Environmental Impact Act and all applicable State and local guidelines; and

2. Adopts the Habitat Conservation Plan for San Bruno Mountain.

Regularly passed and adopted this 14th day of SEPTEMBER, 19 82.

AYES and in favor of said resolution:

Supervisors: K. JACQUELINE SPEIER

JOHN M. WARD

EDWARD J. BACCIOCCO, JR.

ARLEN GREGORIO

WILLIAM J. SCHUMACHER

NOES and against said resolution:

Supervisors: NONE

Absent Supervisors: NONE

EDWARD J. BACCIOCCO, JR.
Chairman, Board of Supervisors
County of San Mateo
State of California

ATTEST:

MINERVA L. TAKIS
Clerk of said Board of Supervisors
(SEAL)

V. DRAFT EIR

ADOPTION AND IMPLEMENTATION

OF

SAN BRUNO MOUNTAIN HABITAT CONSERVATION PLAN

AND

ENDANGERED SPECIES ACT SECTION 10(a) PERMIT

DRAFT

ENVIRONMENTAL IMPACT REPORT

AND

ENVIRONMENTAL ASSESSMENT

JULY 1982

COUNTY OF SAN MATEO
AND
UNITED STATES DEPARTMENT OF INTERIOR,
FISH AND WILDLIFE SERVICE

Prepared by
Thomas Reid Associates
Palo Alto, California

Table of Contents

List of Tables

List of Figures

GLOSSARY

Barriers - objects acting as obstructions to butterfly movement, i.e. trees, dense brush, roads, etc.

Biological Refuge - a unique area harboring unusual populations of animals and endemic plants which are rare or absent in the rest of its surrounding region.

Biological Study - refers to **Endangered Species Survey for San Bruno Mountain: Biological Study -- 1980-1981**, prepared by Thomas Reid Associates.

Buffer Area - a strip of land at least 30 feet wide surrounding a development intended to provide some isolation for the conserved habitat, in order to protect the development from range fires as well as to protect the Conserved Habitat from changes in stormwater runoff and irrigation withinthe development areas.

CC&Rs - Conditions, Covenants and Restrictions imposed on the use of property in a recorded document by the landowner.

Cities - the cities of Daly City, Brisbane and South San Francisco.

Conservation - "to use and the use of all methods and procedures which are necessary to bring any endangered species or threatened species to the point at which the measures provided pursuant to this Act are no longer necessary. Such methods and procedures include, but are not limited to, all activities associated with scientific resources management such as research, census, law enforcement, habitat acquisition, protection and maintenance, propagation, live trapping and transplantation, and, in the extraordinary case where population pressures within a given ecosystem cannot be otherwise relieved, may include regulated taking." (The Endangered Species Act, 1973)

Conserved Habitat - those portions of the San Bruno Mountain area that are or are anticipated to be held by the County and/or the State for open space and conservation purposes as described in greater detail in the HCP. Conserved Habitat includes both Reclaimed Habitat and Preserved Habitat.

Corridors - Areas through which the butterflies can travel unimpeded. Differs from open space in that there can be no natural barriers, i.e. dense brush or trees, within a corridor.

County - the County of San Mateo.

Dedication - transfer of title to San Mateo County those areas of land now in private ownership which will become conserved habitat at the time a grading permit is issued.

Design Guides - directions for conserving habitat in open space and for minimizing impact on species of concern, formulated to guide developers in preliminary site planning.

Developer - person or organization in charge of designing a development plan.

Development Areas - those portions of the San Bruno Mountain Area that are excluded from Conserved Habitat and are anticipated to be subject to urban uses.

Endangered - "any species which is in danger of extinction throughout all or a significant portion of its range, other than a species of the class Insecta determined by the Secretary to constitute a pest whose protection under the provision of this Act would prevent an overwhelming and overriding risk to man", (Endangered Species Act, 1973).

Endemic - a plant or animal species which inhabits only one limited geographic locality, usually due to dependence on certain climatic, physical or biological conditions existing only in that locality. Compare: cosmopolitan.

Enhancement - the restoration of former habitat or improvement of existing habitat through the use of habitat enhancement techniques (e.g. revegetating with host plant species).

Exotics - species which have been introduced into local habitat from outside the United States and which often become pests, outcompeting native species.

Extinct - having disappeared as a species due to failure to reproduce in sufficient numbers to maintain succeeding generations.

Extirpated - extinct in one area although not as a species (not extinct throughout the species' range).

Funding Program - a specific program for providing necessary funds for conservation activity on San Bruno Mountain.

Gorse - Ulex europaeus. A thorny, leguminous shrub with oily wood; "Native of Europe; escaped from cultivation and often well established on the Pacific Coast from Vancouver Island to central California" (Abrams). Extensive on San Bruno Mountain, especially in the Saddle Area.

Grading Plan - layout of areas within a parcel to be temporarily or permanently disturbed in the process of development, indicating the phasing of each disturbed area -- the time at which it will be graded.

Grassland Species - comprising one of the two dominant vegetation communities on San Bruno Mountain, and including localized bunch grasses and many broadleaf species of wildflowers. Compare: brush.

Habitat Conservation Plan - this plan as adopted by the County and the Cities. Synonyms: HCP, Plan.

Habitat Contiguity - unobstructed connection of large open space areas to

facilitate the butterflies' need to move through and to specific areas during their flight season.

Habitat Easement - a recorded restriction on the use of property to prevent uses which are inconsistent with use of the land as habitat by the Mission Blue, Callippe Silverspot and other species of concern.

Habitat Enhancement Techniques - manipulation of habitat in conserved areas to reverse the effects of previous disturbance, control exotic species, retain natural diversity, and maximize the value to endangered species. Examples: seeding/propagation, soil modification, chaining brush. Synonym: habitat manipulation.

Habitat Manager - the Habitat Manager refers to the person or persons employed by the Plan Operator to conduct the field activity of biological implementation and plan supervision and planning assistance.

Habitat Maintenance - care and preservation of the biological resources of conserved habitat which occurs naturally, or is subsequently created through habitat enhancement techniques.

Human Encroachment - any disturbance of habitat by man, including off road vehicle activity, dumping, domestic animal activity, illegal burning and other forms of vandalism, and on a broader scale, urban development and quarrying.

Indefinite Perpetuation - the continued existence on San Bruno Mountain of a viable, reproducing population of a species of concern far into the future; the purpose of the HCP. Compare: extinction, extirpation.

Landowner(s) - those holding fee title or development rights to lands within the San Bruno Mountain area.

Management Unit - areas on San Bruno Mountain selected to represent contiguous areas of similar habitat type with common conservation problems and which would be subject to a uniform level of monitoring or enhancement.

Mitigation - the lessening of adverse development impacts through design modification, fencing at the grading perimeter, erosion control, reclamation, habitat enhancement or other protective activities.

Monitoring - the task, undertaken by the Plan Operator of regular observation of biological processes, development and conservation activities on San Bruno Mountain; the purpose is to assure compliance with the plan, and to measure the success of its implementation.

No Project Alternative - status quo; no habitat conservation or enhancement, and no additional urban development on San Bruno Mountain.

Open Space Buffer - see Buffer.

Oviposition - egg-laying by insects.

Permanent Disturbance - the portion of a development envelope designated for buildings, paving or private landscaping; area permanently lost as

habitat.

Pesticide - a chemical agent used to destroy insect pests.

Phasing - refers to the time schedule of development; the area which can be graded each year.

Pilot Study - small scale test of a habitat enhancement technique or mitigation method to provide statistical verification of success before expansion to a larger area.

Plan Operator - the entity to apply the actual program of conservation to the management units comprising the planning areas of San Bruno Mountain; in charge of the biological implementation of the Plan, and responsible for administration of the Plan -- San Mateo County.

Planned Parcels - those parcels for which development plans have been set forth in the HCP. See Table VI-2.

Preservation - maintenance of habitat in its present condition.

Preserved Habitat - those portions of the San Bruno Mountain area that will be protected against grading and disturbance and which are now in public ownership or which are identified in the HCP for dedication to the County.

Rare - a legal term used by the state of California which is approximately equivalent to the federal term "threatened", see below.

Reclamation Plan - provides for fencing, revegetation, and possible subdivision of Management Units for ease of administration on all graded areas.

Reclaimed Habitat - those portions of the San Bruno Mountain area that will be disturbed by grading, but which are identified in the HCP for restoration and for dedication to the County.

Research - an ongoing program carried out by the Plan Operator, designed specifically to aid the Plan activities, which includes pilot studies on succession, monitoring and enhancement strategies, executed through field work and preceded by literature investigation into methods and costs.

Resource Agencies - United States Fish and Wildlife Service (USF&WS) and the California Department of Fish and Game (CDF&G).

San Bruno Mountain Habitat Conservation Trust Fund - a trust fund established within the Plan area to provide income for habitat conservation activities as specified in this plan. Synonym: Trust Fund.

Section 7 - a section of the Endangered Species Act which requires federal agencies, in consultation with the Secretary of the Interior, to ensure that any action, authorized, funded or carried out by them is not likely to jeopardize the continued existence of any endangered or threatened species or result in the destruction or adverse modification of the critical habitat of such species. (16 USC §1536)

Section 9 - a section of the Endangered Species Act which prohibits the "taking of endangered species. (16 USC §1538)

Section 10(a) - a section of the Endangered Species Act which authorizes the Secretary of the Interior to permit, under such terms and conditions as he may prescribe, any act otherwise prohibited by Section 9 of the Act. The acts may be permitted for scientific purposes, or to enhance the propagation or survival of the affected species (16 U.S.C. Section 1539).

Species - 1) "includes any subspecies of fish or wildlife or plants, and any distinct population segment of any species of vertebrate fish or wildlife which interbreeds when mature." (Endangered Species Act, 1973)
2) "A group of organisms judged by taxonomists (by diverse criteria) to be worthy of formal recognition as a distinct kind." (Ehrlich and Holm, The Process of Evolution, 1963). Synonym: species of concern.

State - the State of California, acting by and through its department of Parks and Recreation.

Sub-species - "a geographical subdivision of a species deemed worthy of formal recognition by a taxonomist." (Ehrlich and Holm)

Succession - undirectional change in the composition of a biological community as the available competing organisms, especially the plants, respond to and modify the environment.

Take - "to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct" with regard to endangered species. (Endangered Species Act, 1973 as amended 1978)

Technical Advisory Committee - a body established to evaluate the scientific and cost effectiveness of the Plan, as executed by the Plan Operator, and recommended revisions. The composition of the TAC is set forth in Chapter V of the HCP.

Temporary Disturbance - the portion of a development envelope designated for grading at the time of development, but which will become reclaimed habitat after a reclamation program is complete; area temporarily lost as habitat.

Threatened - "any species which is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range", (Endangered Species Act, 1973).

Undisturbed - the portion of a development envelope designated to be excluded from any grading associated with development; a preserved area of habitat.

Unplanned Parcels - those parcels for which development plans have not been set forth in the HCP. The Unplanned Parcels are set forth in Table VI-2.

SUMMARY

This Environmental Assessment/Environmental Impact Report (EA/EIR) has been prepared for the County of San Mateo and the U.S. Fish and Wildlife Service (US FWS) in order to assess the impacts of the issuance of a permit under Section 10(a) of the federal Endangered Species Act (1973) and the implementation of a Habitat Conservation Plan. The permit will allow the taking of the Mission Blue butterfly (Plebejus icarioides missionensis) on San Bruno Mountain (SBM), in San Mateo County. The application for the Section 10(a) permit includes a Habitat Conservation Plan (HCP), which was prepared as a supporting document and which will be incorporated in Specific Plans and other permits processed by the County and the cities of Brisbane, Daly City and South San Francisco. The HCP was based on a 2 year biological study. The assessment was made on the impacts associated with the taking of endangered species as allowed by the permit, as well as those mitigating activities mentioned in the HCP.

1. Description In recent years, there have been serious proposals to develop portions of San Bruno Mountain as designated in the 1976 San Bruno Mountain General Plan Amendment. However, because of the presence of federally listed endangered species in the designated areas, it is currently forbidden by Section 9 of the Endangered Species Act. After a thorough biological study of the species of concern was completed, the San Mateo County, the cities of Brisbane, Daly City and South San Francisco, the US FWS, and the California Department of Fish and Game (CDFG) decided to prepare the HCP and apply for the 10(a) permit, as it was thought that the species of concern would benefit by such a plan. The primary purpose of the Plan is to conserve the species of concern: by permanently preserving their habitat through transfer of private lands to the public, by providing funding in perpetuity through the limited development which will be allowed, by enhancement which can improve existing habitat and reclaim former habitat, and by continually monitoring and researching various aspects of Mountain's ecology.

2. Conformance with Plans, Ordinances, and Policies The activities described in the HCP fullfill the requirements set forth in the application for a Federal Endangered Spedies Act Section 10(a) permit. The HCP does not conflict with any other applicable plans, ordinances, and policies.

3. Environmental Assessment - Direct Impacts

a. Biology At present San Bruno Mountain is a biological "refuge" supporting a diverse assemblage of plants and animals, including many native, locally endemic, or range limit species and several rare or endangered species which are found nowhere else. In recent history, man's influence has significantly affected the Mountain's ecology. Surrounding agricultural and urban development has completely cut off the Mountain from other large expanses of natural open space, in some instances isolating certain populations of plants or animals. Urban growth on the Mountain, represented by such projects as the Guadalupe Quarry and Guadalupe Canyon Parkway contributed to the destruction of once valuable habitat. Equally important, natural successional changes including the spread of brush and of invasive exotic species (gorse, eucalyptus, scotch broom, fennel) are gradually eliminating the grassland habitat of many of the Mountain's unusual species, including the endangered Mission Blue

butterfly which is the object of the 10(a) permit.

The HCP has two major objectives: 1) to provide mitigation for the taking of Mission Blue butterflies associated with a certain amount of habitat loss due to development, and 2) conserve, restore, and enhance the ecological value of all open space remaining on the Mountain. The major biological impact is the loss of 370 acres of open space which comprises habitat for 13% of the Mission Blue and 7% of the Callippe population. However if the Plan is successful, the habitat enhanced in conserved areas could restore more acreage than is lost to development. In addition, the Plan contains numerous restrictions and controls on the development process which are intended to mitigate permanent habitat loss or disruption.

b. Economics The provisions of the HCP are not expected to affect the investment viability of the projects because of the continued interest the major developers have in pursuing development as constrained by the terms of the HCP. The annual public cost to local governments of complying with the HCP is to estimated to be minimal (approximately $1000 to $3000). Finally, the permanent funding provided by the HCP ($60,000 annually adjusted for inflation) should be adequate to carry on the basic provisions of the HCP. Contributions of services and program assistance by public agencies would be important to speed the enhancement program, but cannot be committed as part of the HCP.

c. Geology, Soils, and Hydrology The Plan provides for mitigation of impacts caused by individual development projects; these include grading restrictions, reclamation provisions, and surface runoff/erosion control measures. No significant impacts on geology, soils, or hydrology would be caused by the Plan activities, with the possible exception of erosion due to vegetation removal. Preventative or corrective measures will be taken to control erosion.

d. Climate and Air Quality Activities related to the HCP will not significantly effect the Mountains climate. Controlled burns conducted for enhancement will be restricted to "burn days" as designated by the Bay Area Air Quality Management District.

e. Energy and Water Use HCP related activities will not significantly effect energy and water use. Revegetation programs are expected to place little dependence on irrigation.

f. Aesthetics Habitat enhancement activities described in the Plan will have short-term, local visual impacts. Most of the gorse removal will be taking place in the Saddle area, therefore the most noticable visual changes will be there. The yellow flowering european shrub will be gradually replaced by native California wildflowers and grassland.

g. Cultural Resources Three archaeological sites are known on the Mountain, one in Owl and Buckeye Canyons and two on the south slope. Although most HCP activities would not damage sub-surface archaeological sites, if any additional sites are found during HCP related activities, they should be assessed before further work takes place.

h. Education and Scientific Uses The Plan will provide a publicly managed biological reserve for the study of Mountain ecology and will help publicise the great variety of educational and scientific research opportunities available on the Mountain. The Plan can also act to coordinate researcher's activities and will itself benefit from the results of research.

4. Indirect Impacts - Associated Development The various planned development projects described in the HCP would provide 3,021 new dwelling units, 405,000 square feet of office space, 400,000 square feet of commercial space, a 400 room hotel, and additional recreational and community facilities. The specific impacts of each project are, or will be, dealt with in detail in the individual project EIRs.

The significant impacts of these projects include: an influx of new residents to the Mountain area, increased demand for development related services, degradation of local and regional air quality, increased conjestion on local roads, increased energy consumption, and a significant change in the visual setting of many portions of the Mountain. One project may impact a known archaeological site.

5. Mitigating Measures The HCP itself, as a supporting document to the Section 10(a) permit application, is a mitigation measure for the short-term loss of endangered species habitat. The few direct impacts of the HCP such as air pollution, erosion, and habitat lost to other species from gorse removal can be minimized by working carefully and in a limited area.

6. Alternatives to the Proposed Action

The preferred course of action is issuance of the Section 10(a) permit and adoption and implementation of the 1982 HCP. The preferred course of action entails some risk, a short-term impact to the species of concern, and a net reduction in open space on the Mountain. The public acquisition alternative entails less risk and no short-term impact; as such it is the environmentally superior alternative in a local context. The cost of acquisition may be prohibitive or may adversely affect other conservation programs elsewhere.

a. No Project/No Action If No Action is taken, the fundamental conflict between extensive private landholdings and federal protection for endangered species will remain. Nearly half of the Mission Blue habitat is in private ownership and would remain subject to development pressures according to the San Mateo County 1976 San Bruno Mountain General Plan Amendment and adopted general plans of Brisbane, and Daly City. However, virtually none of the approved development could take place without technically violating Section 9 of the Endangered Species Act. It is likely that legal action would be initiated to determine whether and under what circumstances development could proceed. The resulting actions are considered as other alternatives. The principal effect of No Action would be delay pending judicial review.

b. Modified Development With a HCP Alternate development patterns have been considered in the course of developing the Habitat Conservation Plan. No other viable development patterns offer substantially less short-term impact on the endangered species. The HCP is a co-operative effort between local land use authorities and the private landowners. In order for the HCP to be implemented, the landowner must retain a reasonable minimum of use and value from his land. Other patterns are not economically or technically feasible, or would have social, visual or other environmental impacts that are unacceptable to the surrounding communities.

c. Alternate Development Without a HCP Development could proceed without a Section 10(a) permit and HCP if no endangered species habitat were

involved. The only area on SBM which is poor Mission Blue habitat and which is technically suitable for major development is the Saddle. The Saddle is now owned by the State of California and is planned by the County as a low use intensity park. Development on the Saddle would require private acquisition, possibly in trade for the now private land. While this alternative would reduce the short-term impact on the endangered species, it would not provide the enhancement benefits of the HCP, and it could possibly impact another endangered species, the San Francisco garter snake. Development there would have significant traffic and visual impacts; the community rejected a plan for development on the Saddle in 1976.

d. Change Endangered Classification The requirement for a Section 10(a) permit stems from the classification of the Mission Blue as "Endangered" by the U.S. Department of the Interior. If the classification were changed to "Threatened", the prohibition against taking (Section 9) could possibly be removed, if special regulations were promulgated by the Department of the Interior, but the requirement for consultation (Section 7) would remain, possibly affecting the involvement of federal agencies in the projects. If the butterfly were removed from the endangered species list as no longer endangered, the present legal constraint to development would be removed. In either case, none of the mitigation and enhancement provisions of the HCP would be available to protect the species.

e. Public Acquisition The HCP is a means to convey private lands to public ownership for conservation and to provide perpetual funding for enhancement activities. Public acquisition of private land would increase the amount of land conserved. This would require fair market purchase of roughly 1200 acres at a cost of $120 million. Public funding of the enhancement program would require an additional $60,000 annually. Funds for purchase of endangered species habitat come from the Land and Water Conservation Fund. Expenditures from 1967 to 1981 for habitat have been $54 million nationally, and $12 million in California.

7. Growth-Inducing Impacts The Section 10(a) Permit, in allowing development to take place on the Mountain, is growth inducing; the effects of that growth are described here as the indirect impacts of the proposed action. However, the permit and HCP will not stimulate further growth, nor will it allow more growth than permitted in the 1976 San Bruno Mountain General Plan, because of the absence of traditional growth inducing factors in the San Bruno Mountain area, and because of the HCP's strict approval process with regard to ammendments which could permit future development proposed on the Mountain.

8. Short Term/Long Term Uses of Man's Environment and Significant Irreversible Environmental Changes The Section 10(a) permit with the HCP as a condition is, in essence, a model case of short-term loss in expectation of a long-term benefit. The short-term loss is 370 acres of open space, while the long-term benefit is the conservation of the endangered species, other species of concern, and the overall ecology of the Mountain.

9. Significant Environmental Effects and Significant Unavoidable Adverse Effects The direct significant environmental effects of the action are: the transfer of almost 800 acres of currently held private land to the public, the enhancement of presently low quality habitat, and the management of invasive exotic species. Significant unavoidable adverse effects include: the short term loss of habitat of 13% of the Mission Blue population and 7% of Callippe Silverspot population.

I. PROJECT DESCRIPTION

A. PROJECT LOCATION

San Bruno Mountain is located on the northern San Francisco peninsula just south of the city of San Francisco (see Figure I-1 and I-2). Most of San Bruno Mountain (SBM) is unincorporated land, surrounded on all sides by the cities of South San Francisco, Colma, Daly City, and Brisbane. Access to the Mountain is from Bayshore Blvd, Hillside and Randolph Avenues, and Guadalupe Canyon Parkway. Topographically, the Mountain is made up of two ridges. The larger, the main or southeast ridge, reaches an elevation of slightly over 1,300 feet, and includes the Radio Ridge and Southeast Ridge planning areas. The smaller ridge on the northeastern side of the Mountain, which makes up the Guadalupe Hills and Saddle planning areas, reaches an average elevation of 840 feet (see Figure I-3).

Existing land uses on the Mountain include: a 1,952 acre county park (currently undeveloped), an active rock quarry, transmission lines, broadcasting antenna sites and related buildings, and illegal off road vehicle activity. The SBM study area consitst of almost 3600 acres, of which approximately 3500 acres are open space which contain a unique and varied array of plant and animal species, including several which are rare or endangered.

B. PROPOSED ACTION

1. Background

In 1975 Visitacion Associates (VA), major landowners on San Bruno Mountain (SBM), proposed to develop 8,500 units of residential housing and 2,000,000 square feet of office and commercial space on the Mountain. The San Mateo Board of Supervisors, after an intensive political battle, adopted a General Plan Amendment for the Mountain in 1976 which designated 2,200 units of residential and some office and commercial space on the South Slope and Northeast Ridge portions of the Mountain. In addition, portions of SBM in the City of Brisbane and Daly City were designated for development according to the general plans for those cities. The majority of these areas contain grassland habitat. The Saddle area, which was previously proposed for intensive development, was donated and sold to the State for open space.

Shortly after the adoption of the 1976 General Plan Amendment, it was discovered that the Mission Blue butterfly, listed as an endangered species by the U. S. Fish and Wildlife Service on June 1, 1976, inhabited grassland portions of the Mountain. Section 9 of the 1973 Endangered Species Act prohibits the "taking" of any endangered species. Thus, at this point in time, the development proposed in the General Plan amendment was blocked by the Act since the grassland area likely contained the endangered species, and grading for development would inevitably kill some lifestage of the butterfly.

In 1980, with funding provided by VA, San Mateo County contracted with Thomas Reid Associates to do an extensive Biological Study of the Mission Blue and Callippe Silverspot (a species formally proposed for endangered status) butterflies in order to assess their population, distribution, and habits on the Mountain. The Study determined that the butterflies do inhabit most of

FIGURE I - 1
SAN BRUNO MOUNTAIN - REGIONAL LOCATION

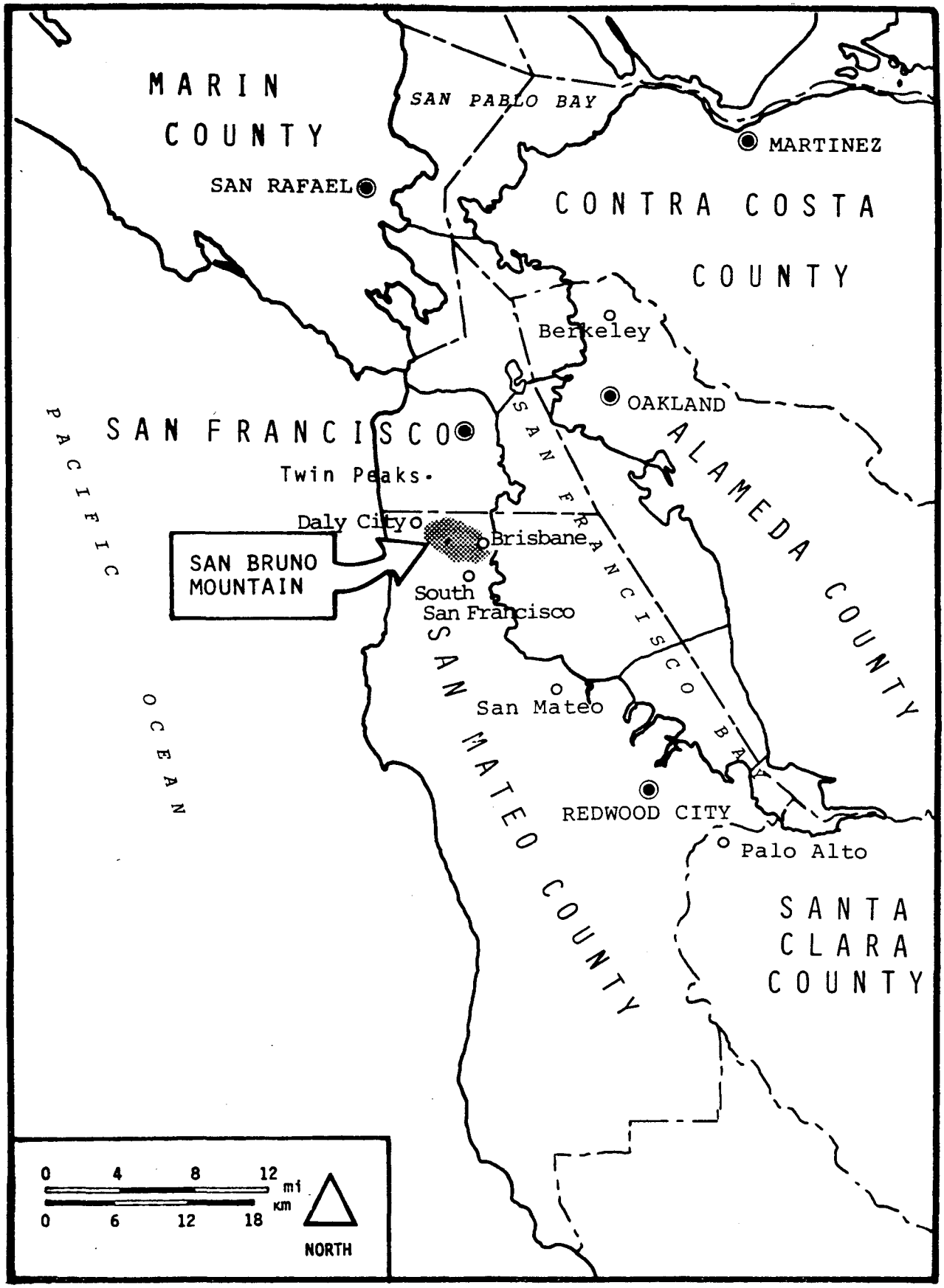


FIGURE I - 2
SAN BRUNO MOUNTAIN - VICINITY LOCATION

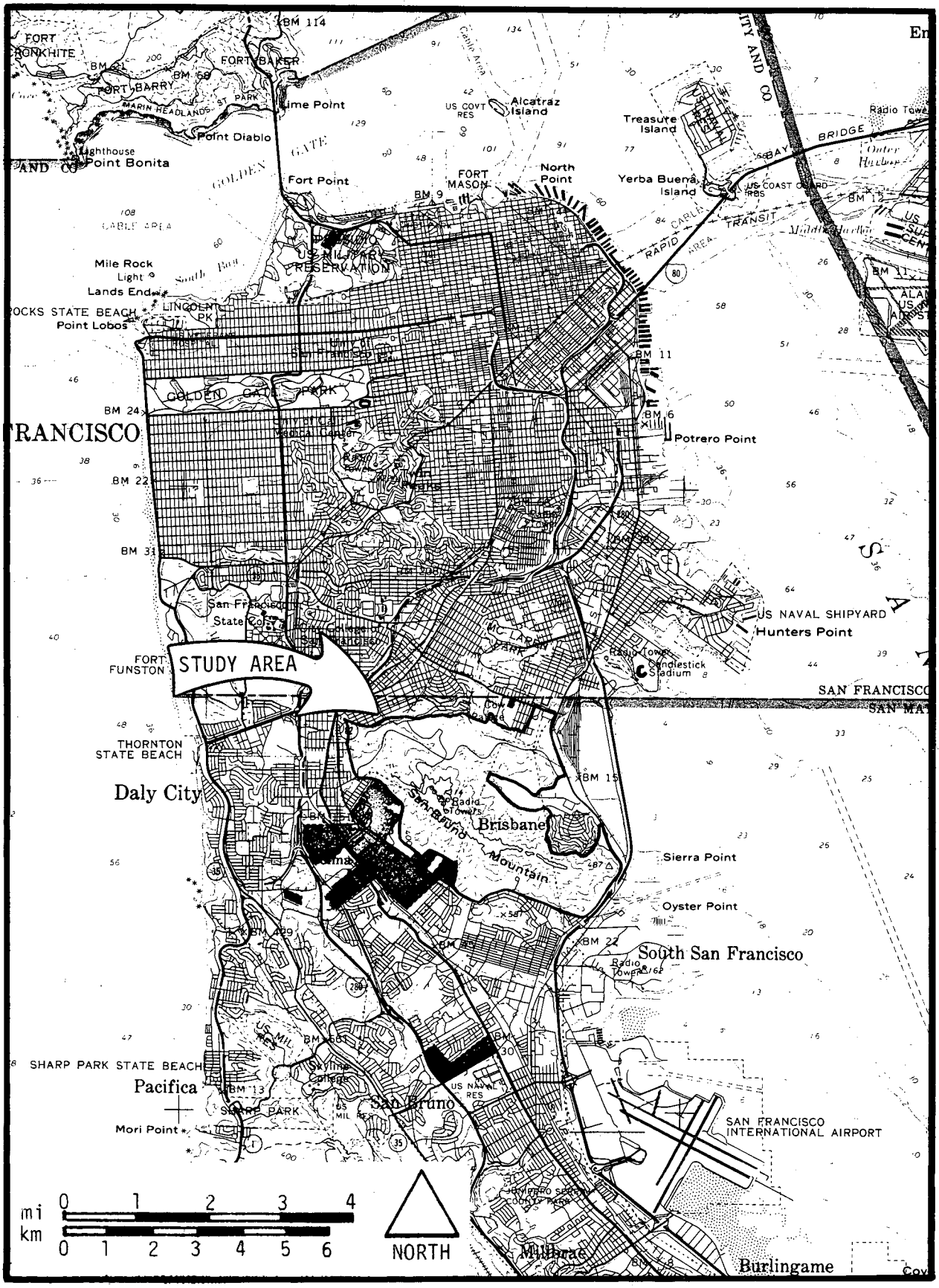


FIGURE I - 3
STUDY AREA

the grassland portions of the Mountain including those areas designated for development, and that natural forces and development pressures are substantially threatening the existence of the insects.

The San Bruno Mountain Steering Committee was formed in 1980 to deal with the endangered species issue. The Committee is made up of representatives from San Mateo County, biological consultants to the County, Visitacion Associates, prospective developers, landowners, U.S. Fish and Wildlife Service (USFWS), California Department of Fish and Game, Committee to Save San Bruno Mountain, Brisbane, South San Francisco, Daly City, and others. Based on the findings of the Biological Study, the Steering Committee developed a Habitat Conservation Plan (HCP) for the Mountain. The HCP is a supporting document to an application for a Section 10(a) permit under the Endangered Species Act.

2. The Section 10(a) Permit

Section 10(a) of the Endangered Species Act authorizes the Secretary to permit, under such terms and conditions as he may prescribe, any act otherwise prohibited by Section 9 of the Act for scientific purposes or to enhance the propagation or survival of the affected species (16 U.S.C. 1539).

The issuance of the Section 10(a) permit would cause two major actions to take place on the mountain:

a. Conservation of the Species of Concern. The HCP is designed to conserve and enhance as much of the remaining natural habitat on the Mountain as possible and thereby provide for the indefinite perpetuation of the Mission Blue, and conserve and enhance the value of the Mountain as a whole. A major action made possible by the HCP will be the transfer of nearly 800 acres of privately held lands to the Public (see Figure I-4). The Plan will rely on preservation of existing ecological values, reclamation of disturbed areas with native plant species, assistance to developers in reviewing and suggesting alterations of project design to reduce impacts, vandalism control, restoration of areas disturbed by off-road vehicles, and exotic species management.

b. Limited Development. Housing construction, which would have been otherwise prohibited by the Endangered Species Act, will be allowed (see Figure I-5). The grading activities associated with the construction will cause the taking of the Mission Blue butterfly including eggs, larvae and adults depending on the time of year in which construction activities occur. Habitat of approximately 13% of the Mission Blue and 7% of the Callippe populations will be destroyed over a period of several years. Development will provide the funding source for the conservation activities described in the HCP. In addition, to mitigate impacts caused by the development, developers will be required to comply with provisions set forth in the Plan.

C. THE PLAN

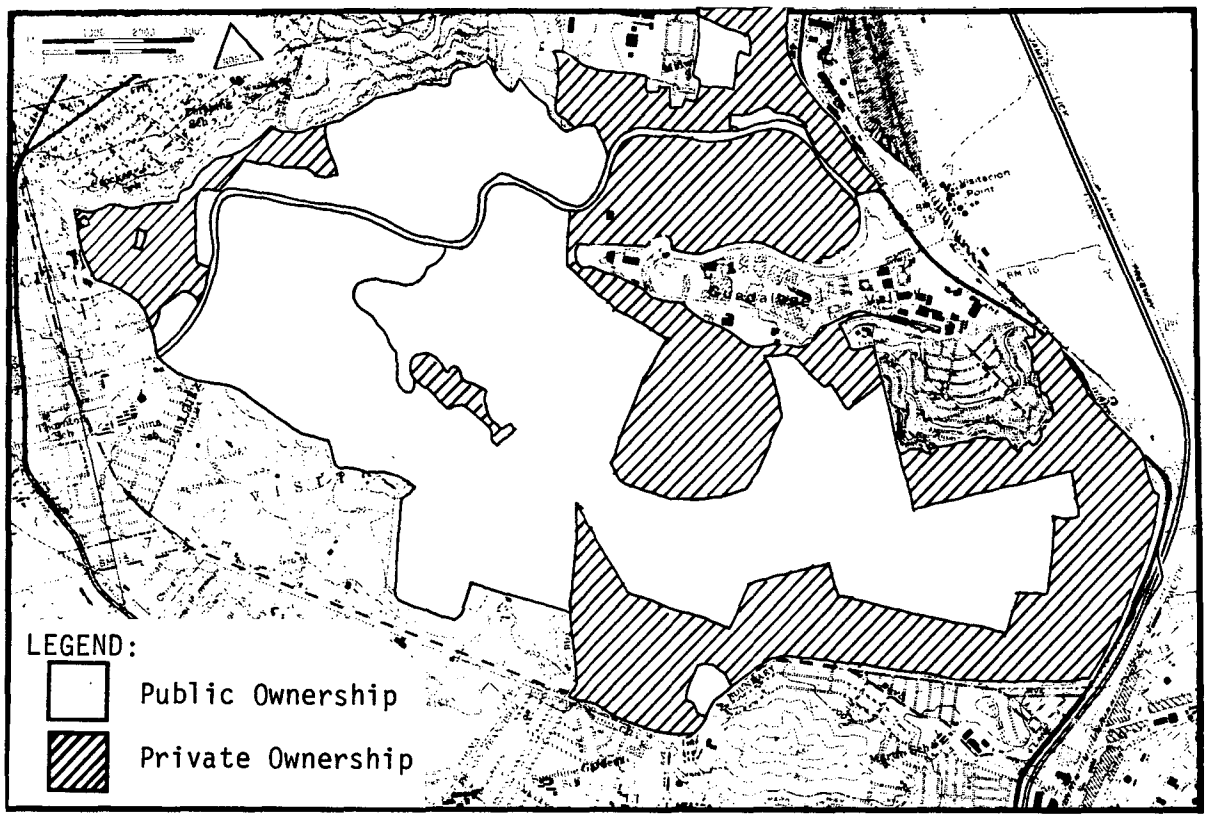
The HCP comprises a biological program and an institutional program.

1. Biological Program

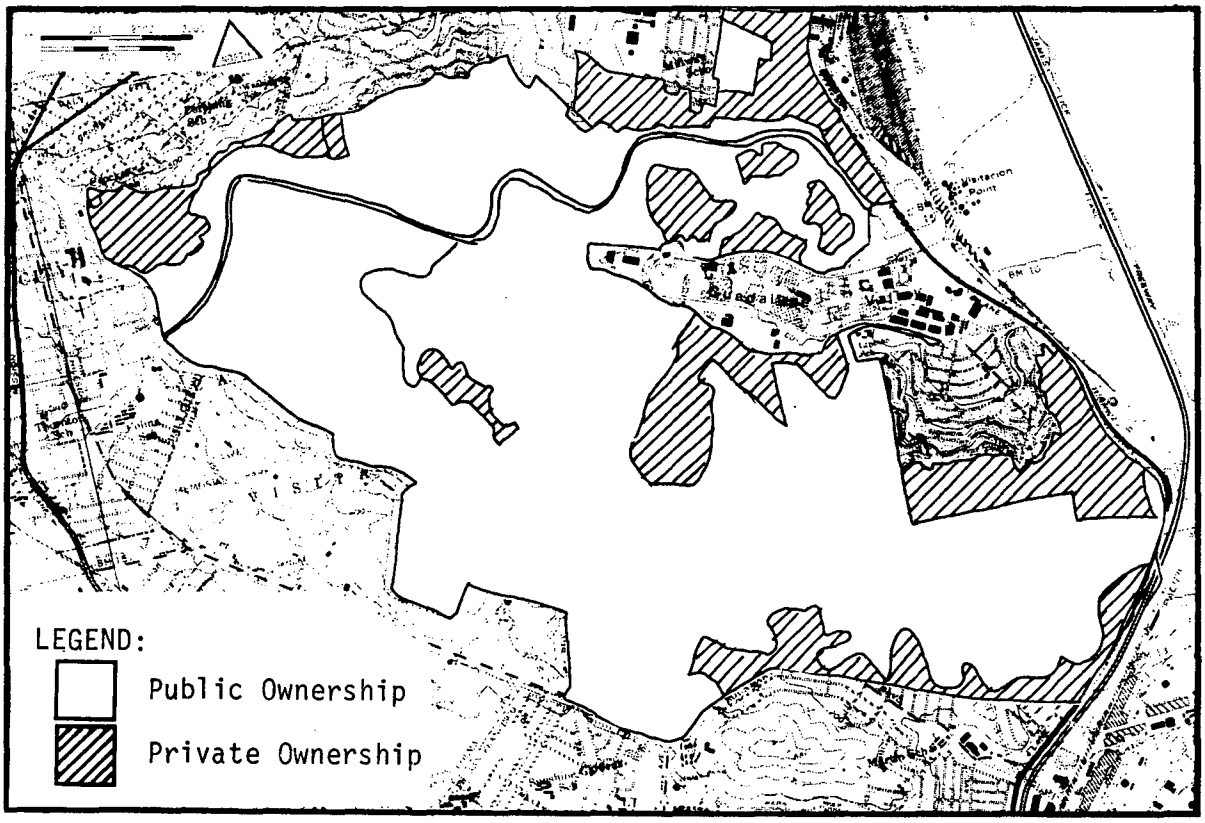
The biological program sets out the issues, guiding principles, and activities which make up the plan. The primary issues are the preservation

FIGURE I - 4
LAND OWNERSHIP AND DISPOSITION

PRESENT OWNERSHIP

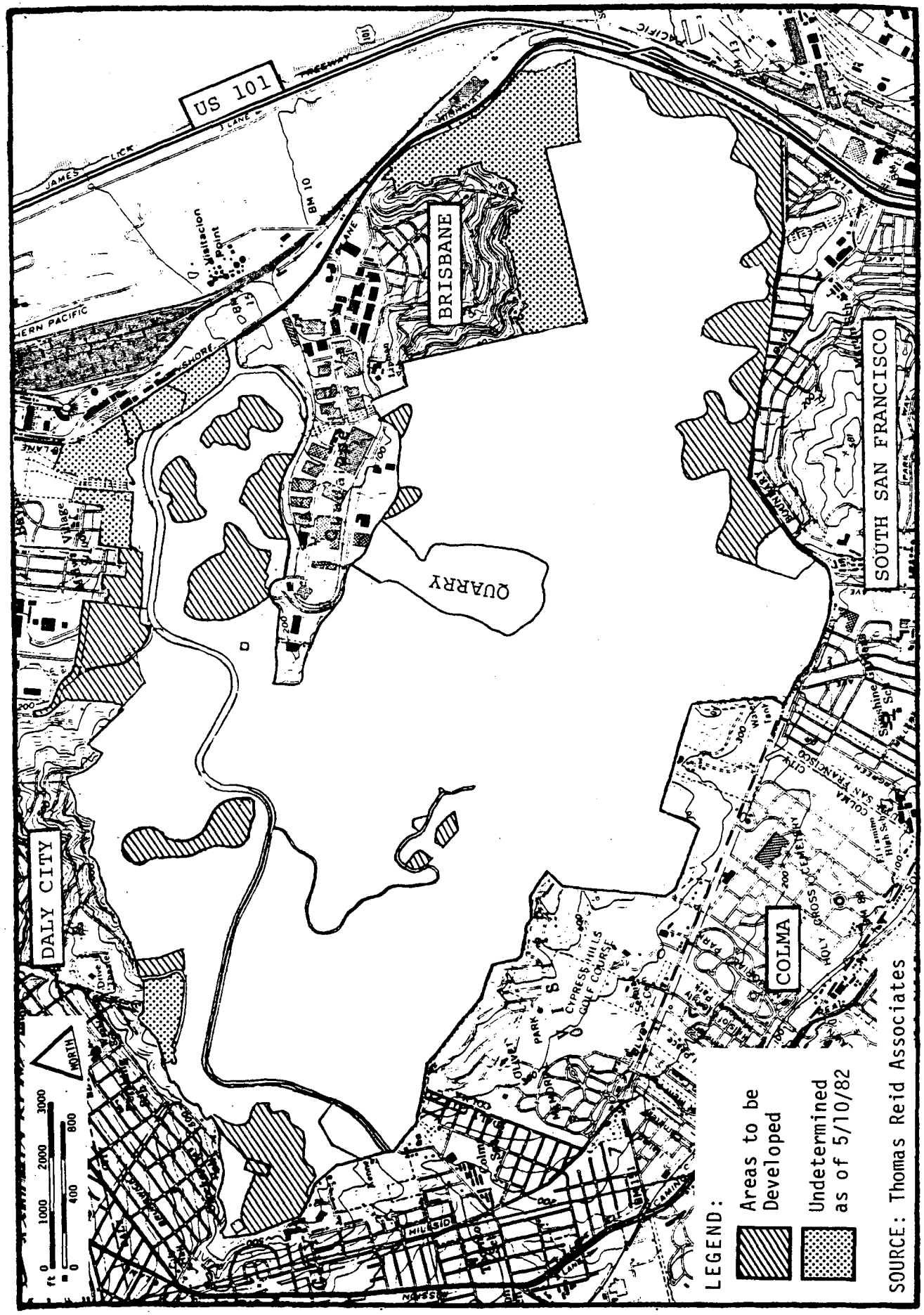


FUTURE DISPOSITION UNDER 1982 HABITAT CONSERVATION PLAN



SOURCE: Thomas Reid Associates.

FIGURE I - 5
AREAS TO BE DEVELOPED



and conservation of the Mountain's unique and diverse ecology, and providing for the indefinite perpetuation of the Mission Blue and other species of concern.

A broad set of guiding principles were utilized in the development of the Plan, these include:

- o the reliance on preservation rather than restoration, especially the preservation of existing ecological values and diversity (i.e. the diversity of species, community types, and topographic features, annual and perennial grassland, brushlands, differing slope orientations, exposed and protected areas, and moist and dry areas);
- o the use of habitat manipulation for enhancement when the manipulation can compensate for the loss of native areas from past disturbances (i.e. off-road vehicle activity, areas of exotic species invasion, and eroded or cut slopes), or when it will compensate for loss of habitat due to development, or finally, when it reverses a natural process, such as succession of grassland to brushland, which threatens the existence of an endangered species;
- o the phasing of development areas to mitigate impacts caused by grading and phasing of the enhancement activities within conserved habitat to assess effectiveness;
- o resolving uncertainties through research and pilot studies;
- o maintaining an ongoing review process of all activities taking place on the Mountain.
- o Plan assistance to developers to review and suggest alterations of project design which will mitigate adverse impacts to the habitat of endangered species and other species of concern.

There are three general categories of activities discussed in the HCP: research, monitoring, and habitat enhancement techniques. Due to the experimental nature of portions of the plan's implementation program, research is necessary to resolve remaining biological uncertainties and to further the successful operation of the plan. Beside the practical application, there is a great potential to gain important scientific knowledge by supporting on-going research and encouraging new research by students and researchers from local universities and colleges.

Monitoring is an essential element of the plan as it will provide the means for determining its success. There are four categories of monitoring outlined. The mitigation activities for each development area (i.e. grading and reclamation activities) will be monitored for compliance; the population status of the species of concern will be monitored for major changes; the research will require monitoring of results and the pilot studies will require monitoring to determine success and feasibility of broader application. Finally, the habitat enhancement activities described in Table I-1 will require close observation in order to optimize the techniques used.

Several habitat enhancement activities are described in the plan. The cost, scheduling and timing, impacts, and benefits of each is shown in Table I-1 (also see Figure I-6 for the priority areas for habitat enhancement). The impact analysis will be based on the approximate size and probable location of the areas to be enhanced on a yearly basis.

TABLE I-1
HABITAT ENHANCEMENT TECHNIQUES

MEASURE	DESCRIPTION	SCHEDULE/COST	EFFECTS	ANNUAL PROGRAM
Seeding/ Propagation	Seed collection, sowing; transplanting seedlings, adults	Oct-Dec; year round 1 yr lead time; Repeated Cost: varies	Enhancement of natural process, loss of annual grass, brush habitats	Years 1-3 100 acres Years 4 on 4-12 acres per year
Chaining Scraping/ Raking	Mechanical means of brush/dense grass/exotic species control	May-Sept; repeat Cost: moderate	Indirect enhancement of habitat; grassland loss	4 to 12 acres
Burning	Controlled burn of dense grass/ brush/exotics	Aug-Sept; repeat. Cost: low	Indirect enhancement; grassland loss	4 to 12 acres
Herbicide Applications	To control exotic species/ brush seedlings	May-Sept; repeat. Cost: moderate	Possible impact to other species	local hand application of burned areas
Soil Modification (rock spreading)	Spreading native aggregate to recreate rocky areas; w/seed	Aug-Sept; repeated. Cost: initially high, later low	Indirect enhancement; grassland and species loss;	Experimental 1 acre initially
Reintroduce Grazing	use of cattle sheep, goats for grassland successional management	not determined	may retard bunch grass establishment, may benefit some natives	Not determined
Vandalism/ Fire control	Patrolling Conserved habitat areas for vandals	year around Cost: low	will decrease off-road vhehcles/ vandalism/fires	entire area
Lab rearing/ Cultivation of species of concern	Artifical rearing in a laboratory or nursary	Seasonal Cost: high	Could increase populations; May increase susceptibility to disease/pests	Would only be done if other measures fail
Off-Site Introduction of species of concern	Introduction of lab reared larvae, eggs, or adults	Seasonal Cost: high	Could increase populations and range	Would only be done if other measures fail
Landscape Modification	creating artificial habitat areas	Oct.-Dec. Cost: high	Destruction of existing landscape	Experimental applicable during project grading

FIGURE I - 6
PRIORITY AREAS FOR HABITAT ENHANCEMENT

2. Institutional Program

The institutional program requires participation by both public agencies and private landowners. The public agencies will be responsible for regulation and administration of the Plan, compliance with the Section 10(a) permit conditions and HCP provisions, administering the funding mechanism, and contributing in kind services.

The application for the Section 10(a) permit will be jointly submitted by San Mateo County, and the Cities of Brisbane, Daly City, and South San Francisco. The 10(a) permit allows the local municipalities to carry on the process of regulating land uses within their boundaries. A memorandum of understanding will be signed by all participants of the Plan and will act as a legal binding contract. The regulation and administration of the conserved habitat will be the primary responsibility of San Mateo County; because of this, it will act as Plan Operator. The local municipalities will retain land use authority over their jurisdictions. Activities of the HCP will be overseen by a Technical Advisory Committee for at least five years.

Each City or the County will be responsible for complying with the conditions of the permit and the provisions of the HCP within their municipal boundaries. Enforcement of permit conditions within the development areas will rely heavily on the issuance of stop work orders. Violations of the permit or HCP conditions will require appropriate remedies which will be determined specifically for a particular violation and may include reclamation of improperly graded areas, donation of additional areas of conserved habitat, or revocation of the grading permit. The U.S. Fish and Wildlife Service will have final enforcement authority over the terms of the 10(a) permit.

The funding mechanism is a key element of the plan, intended to carry on the Plan in perpetuity. The funding element is broken down into three overlapping phases: the initial phase ($25,000 annually), the service contract phase ($ amount will vary), and the permanent funding phase ($60,000 annually). All sums are expressed in January 1983 dollars and will be adjusted for inflation.

Contributions from various public entities and landowners or developers will make up the initial phase. The amount is expected to be sufficient for the County to establish and fill the job category of the Habitat Manager. Monitoring and minimal enhancement work would occur before development began. The service contract phase will be paid for by the specific developers as construction activities take place. These funds will allow expanded research and enhancement as well as pay for planning assistance and field supervision. Finally, the permanent funding will be gained through annual assessments on individual dwelling units within each development area. These $20.00 assessments (adjusted for inflation) will be paid annually into a trust fund. Once the first phases of development activities begin, the level of funding will reach and exceed the $60,000 level. As development progresses, the fund will consist of the continuation of the $25,000 from the initial phase, continued funding during the contract phase, and the assessment funding as dwelling units are completed. Ultimately, once all development is completed, the initial and contract funding will cease and the assessments will make up the entire $60,000 annual conservation fund.

Public agencies will contribute to the Plan financially by providing special purpose grants and in-kind services. San Mateo County will administer and manage HCP personnel, provide some tools and equipment, and provide labor for special projects. The Cities will provide added police and fire protection to help combat vandalism, off-road vehicle activity, and arson.

All landowners on the Mountain have been notified of the Plan and all have some regulatory or funding obligations with regard to their parcels. Volume two of the HCP discusses each of these parcels in great detail. Each parcel is described with respect to location and description, ownership, proposed project, current planning status, biological issues, impact from proposed project, and HCP objectives. In addition, each parcel has an HCP operating program which discusses the landowner's or developer's specific obligations under the Plan. The obligations are simple if no land use changes are proposed (i.e. notifying the Plan operator of any proposed changes in land use), but may be quite complex if there are development plans for the parcel.

On properties where development plans are proposed, developers are obligated to comply with the following general provisions:

- o No contruction will be permitted outside the boundary of the areas to be graded. In most cases, an adjustment of up to 30 feet can be made to this boundary.
- o Dedicate areas outside the building envelopes to the Plan Operator for conserved habitat;
- o Participate in the funding program described above;
- o Comply with a specific set of construction and reclamation provisions. These include phasing, providing for erosion control, fencing areas to be graded to protect conserved habitat, and reclaiming the temporarily disturbed areas with a Plan Operator approved reclamation plan;
- o Establish Covenants, Conditions, and Restrictions on the development which will prohibit the use of aerial or large-scale pesticide application without Plan Operator approval;
- o Establish and maintain a buffer area of approximately 30 feet, or some other suitable fire break, between the development areas and conserved habitat to protect the development area from fires;
- o During construction activities, contract with the Plan Operator to periodically monitor grading and reclamation activities until such activities are completed.

The Plan Operator will also have obligations with respect to the landowners or developers. These include: preparing and executing an annual operating program for the conserved habitat within each parcel, monitoring all construction activities within the development areas, providing advice and direction to the landowners or developers as they comply with their obligations, reviewing all materials submitted in a timely fashion, and accepting dedications of conserved habitat.

II. PLANS, ORDINANCES AND POLICIES

San Bruno Mountain includes the jurisdictions of 3 cities and a county, and is subject to the regulations of numerous state, federal and other public agencies. This section lists and discusses the primary plans, ordinances and policies which relate to the issuance of the Section 10(a) permit and the implementation of the Habitat Conservation Plan. Plans, ordinances, and policies relating to the development projects are not included; see specific project environmental documents for a listing of those.

A. FEDERAL

U.S. Fish and Wildlife Service: Because the the Mission Blue butterfly is a Federally listed endangered species it is subject to the requirements of the Federal Endangered Species Act of 1973. Section 9 of the Act prohibits taking of endangered species. Section 10(a) authorizes the Secretary of the Interior to permit taking if the taking will result in an overall benefit to the species. Since the USF&WS has been participating in the development of the HCP, suggestions on how to best meet the requirement of the Endangered Species Act have been incorporated into the Plan. Other listed Endangered Species on the Mountain include the San Bruno Elfin Butterfly, which is not the subject of the Section 10(a) permit action of the HCP, and the San Francisco Garter Snake. The snake has not recently been positively identified on the Mountain.

Also pursuant to the Endangered Species Act the U.S. Fish and Wildlife Service has prepared a draft Recovery Plan for endangered species on San Bruno Mountain. The document describes the threats to the continued existence of those species and outlines the actions needed to deal with those threats. The Recovery Plan also assigns responsibility and estimates the costs for carrying out those actions.

B. STATE

California Department of Fish and Game: Although none of the insect species of concern on San Bruno Mountain are listed by the State, the CDF&G, in 1976, entered into a cooperative agreement with the U.S. Fish and Wildlife Service, "under which the Department agreed to manage federal- and state-listed endangered, threatened, and rare species, and become eligible to receive Endangered Species Act grant-in-aid funds" (At the Crossroads, 12/80). There are two plant species (Arctostaphylos pacifica and A. imbricata) listed by the State which are in the County Park area of the Mountain. The CDF&G has participated in the preparation of the HCP and is fully aware of its effects on the species of concern.

California Division of Forestry (CDF): The CDF is in charge of putting out fires within the County portion of San Bruno Mountain. Their major policy with respect to fire control is to attack all unwanted fires and protect lives and property. The CDF is implementing a Chaparral Management Program (CMP); the primary goal of this program is to increase the social value of an area by eliminating chaparral species and opening up these areas for other uses. Wildlife management or conservation is included as a social value and would be amenable to the CMP. The San Mateo County Division of Parks and Recreation is in the process of applying to the program for control of the large gorse areas

in the Saddle. The HCP is in full agreement and will coordinate with the Parks Department's plan to eradicate gorse through the CMP.

California Department of Parks and Recreation: The Saddle area of the Mountain is owned by the State, and although the management of the Park will be by San Mateo County, the development of the park must comply with the State Resources code. The purpose of a State Park, as defined by the code, is to preserve outstanding natural, scenic, and cultural values, indigenous aquatic and terrestrial fauna and flora, and the most significant examples of the ecological regions of California (Co. Park General Plan, May 1982). The HCP would aid in the acheivement of this purpose.

Local Agency Formation Commission The Local Agency Formation Commission (LAFCO) is a State agency which is funded by the County government. It establishes the Sphere of Influence of each incorporated city as a basis for reviewing request or changes in city boundaries. The city Sphere of Influence is defined by Section 54774 of the Government Code as "the probable ultimate physical boundaries and service areas of a local government agency". LAFCO has the power to approve all annexations of unincorporated lands to a City. The Cities of South San Francisco, Brisbane, and Daly City all have Spheres of Influence on San Bruno Mountain and many of the developments proposed in the HCP will require annexation. Figure II-1 shows the LAFCO Spheres of Influence on San Bruno Mountain.

C. LOCAL

City of Brisbane General Plan: The Brisbane General Plan adopted in January 1980 has a listing of policies with which the City intends to guide its future land use. It appears that both the Section 10(a) permit action and the HPC do not interfere with any of Brisbane's goals or policies. In most cases, the HCP fulfills policy statements; this is especially true with respect to the Northeast Ridge development project. Goals and policies which are fulfilled by the HCP include:

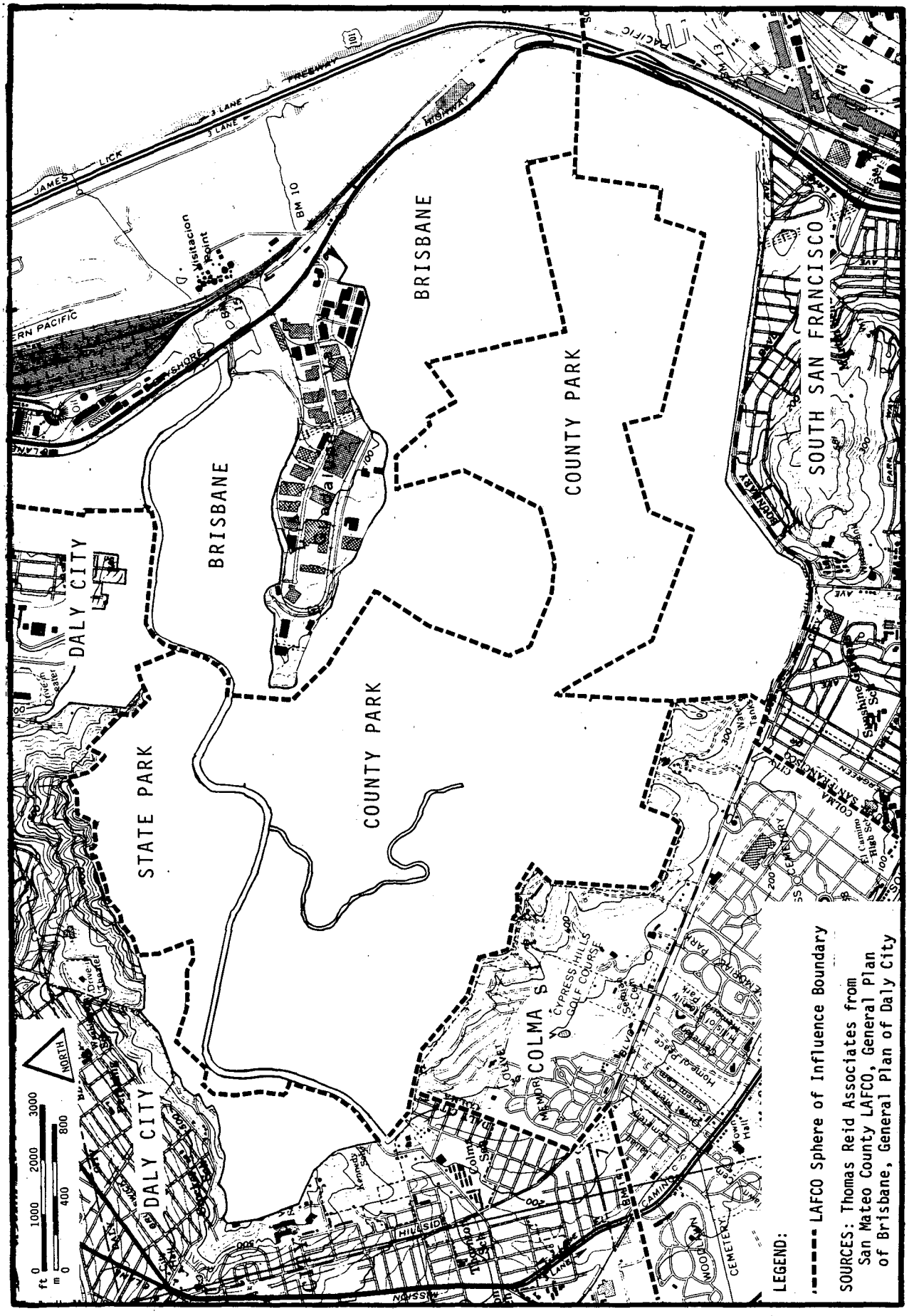
Goals

- The City desires a diversified economic base that would increase the tax revenue and contribute to the City's ability to provide quality community services.

Policies

- Protect and conserve elements which make up Brisbane's rural character.
- Develop and enforce grading control.
- In the Brisbane Acres area, preserve vegetation and natural features through density transfers and minimize the disruption on existing plant life.
- In the Northeast Ridge area development should attempt to avoid environmentally important areas and landscaping and reseeding of graded areas should utilize indigenous plant species.
- Protect wildlife habitat and water courses.
- Preserve ridgelines as a visual amenity.

FIGURE II - 1
LAFCO SPHERES OF INFLUENCE



Daly City General Plan: Daly City's General Plan of July 1978 specifies a set of goals, policies, objectives, and recommendatons which are to quide the City's future land use. On San Bruno Mountain, Daly City's jurisdiction includes the Reservoir Hill and Rio Verde Project areas and surrounding open space. Some of the City's goals and policies are met by the issuance of the Secton 10(a) permit and the HCP. These are:

Goals

- The City's environmental goal includes preserving open space, and conservation of rich and varied natural resources.

Policies

- The City shall encourage retention of open space which provides recreational opportunities and visual amenities and where development occurs, save existing vegetation and integrate it into new land uses.

Objectives and Recommendations

- Implement a grading ordinance which will minimize erosion and require stabilization and planting of raw slopes and cuts. Require stringent inspection and enforcement procedures.
- Protect and/or expand wildlife habitats in the coastal bluff and other areas where possible.
- Restrict motorcycles and other off-road vehicles to easily accessible areas with less fire and erosion danger.
- Encourage management of brush areas, grassland and existing stands of trees on San Bruno Mountain to avoid dangerous fuel build up which might lead to fire and extensive erosion.
- When a change of land use occurs in an area containing desirable existing vegetation, efforts should be made to save the vegetation and integrate it with the new use.
- Require as a condition of any new subdivision that land be dedicated for public park use.

Daly City General Plan (DCGP) recommends that Reservoir Hill be developed as a residential community, and that such a development be carefully evaluated and adverse impacts mitigated. This project is in the Hillside neighborhood. The Section 10(a) permit makes development of the Hill possible, and the HCP includes a detailed mitigation section with regard to the species of concern.

The Rio Verde Estates project is in the Southern Hills neighborhood, while the Rio Verde Heights project is in the Bayshore area neighborhood. While there is no mention of a residential development in the Southern Hills area, the DCGP suggests that in the Bayshore area, additional single-family development clustered on the lesser slopes of the northeast face of the Mountain would further strengthen the single family character of the neighborhood.

South San Francisco General Plan: South San Francisco (SSF) is currently in the process of updating several elements of their General Plan. Although the South Slope of San Bruno Mountain is currently not part of South San Francisco, it is included in the City's sphere of influence. The Housing and Open Space elements were updated in 1980 and 1981 respectively. The other elements are not as recent. Objectives of the 1969 General Plan relevent to the HCP include: the annexation of the southerly slope of San Bruno Mountain

to the City, and the conservation of open space around development areas by clustering the development.

In 1972, a Conservation element was prepared for South San Francisco. Goals acheived in the HCP include:

- The City of SSF should co-operate with the County of San Mateo and its several municipalities, the Association of Bay Area Governments, the Bay Conservation and Development Commission, the State of California, and the Federal Government in a joint effort to promote the preservation of local and regional open-space.
- The City should encourage the private interests to devote their lands and capital to the cause of open-space conservation and preservation.
- Open space should be used for the relief of urban pressures, the health and welfare of the individual resident, and the citizenry-at-large, and the long-range preservtion of local and regional ecology.
- The long-range protection of the environmental quality of SSF requires the City to promote the preservation of wildlife habitats, fisheries, mud flats, marsh grasses, and open water. This preservation is essential to both human and animal well-being.

The Open Space element adopted in April 1980 sets out objectives and policies regarding the development of open space. No specific policies are applicable to the HCP.

San Mateo County San Bruno Mountain General Plan Amendment The San Bruno Mountain General Plan Amendment (SBM GPA) was prepared in 1976 after the Crocker Hills General Plan Amendment (CH GPA) DEIR was completed. Although the CH GPA DEIR included development in the Saddle Area, this was dropped when Visitacion Associates donated the land to the State for open space. The SBM GPA currently is unworkable because of the presence of the endangered species. The Federal Endangered Species Act prohibits any development in the proposed development areas because of the presence of the Mission Blue. The Section 10(a) permit would free the County and cities from any prohibitions on taking the Mission Blue as long as all concerned parties comply with the provisions of the HCP. Thus, the two actions allow the County and cities to proceed with their normal planning responsibilities on San Bruno Mountain. In addition, the issuance of the 10(a) permit and the HCP helps the County meet several of the goals and objectives set forth in the SBM General Plan Amendment. Those are as follows:

General Goals and Objectives

- Provide for continued economic growth while meeting the needs for open space in northern San Mateo County;
- Aid in alleviating the general housing shortage in San Mateo County by providing for the construction of a significant number and variety of new housing units;
- Preserve and enhance the open space and environmental resources of San Mateo County;
- Reduce overall environmental impacts and preserve open space through the use of a compact development pattern;
- Preserve the Saddle planning area in open space use while providing opportunities for development in other planning areas.
- Land with a slope generally exceeding 30% should be left in open space.
- Existing tree and vegetative masses should be incorporated into the

developed areas at more detailed phases of planning
- o Retained areas of existing vegetation, including those within the development land areas and those in the passive and active open space areas, should be protected.
- o Landscaping plans for all planning areas should utilize plant types existing on-site, and where this is infeasible a non-agressive plant species should be used.
- o Minimizing topsoil and existing vegetation loss during construction through erosion control measures.
- o Protecting unique, and rare and endangered species of plants in Owl and Buckeye Canyons and in the Saddle planning area.
- o A Wildlife management program should be developed for the Plan Area, especially in the open space areas, during the development of Specific Area Plans.
- o Removal of vegetation during grading should be minimized and phased to reduce visual impact.
- o The visual integrity of the main ridgeline of SBM should be retained.
- o The view of the Northeast Ridge from Brisbane should be protected by retaining a significant amount of natural open space in this planning area, and blending development with the natural land forms of the site.
- o A landscape plan should be prepared which preserves and provides for management of the existing vegetation and protects and expands the existing native plant stock.
- o Plants should be selected which are compatible with the microclimates of the Plan Area.
- o Development on San Bruno Mountain should be phased to allow all necessary environmental protection measures to be accomplished.
- o Grading should be staged so that the aerial extent of grading operations would be limited to the areas of immediate construction activity, where practical.

San Bruno Mountain County Park General Plan The County Park General Plan (SBM CP GP) was published in May 1982; the same month as the Draft HCP. The SBM CP GP has incorporated many of the provisions of the HCP, especially with regard to exotic species management and preservation of rare and endangered species habitat. Generally, the two Plans are compatible with regard to preserving the ecology of the Mountain. General Plan Policies acheived by the HCP are as follows:

Policies
- o Erosion susceptible soils shall be revegetated using native or other grass and vegetative species.
- o Areas with erosion from off-road vehicles or other causes shall be returned to pre-existing conditions by: a) limiting the use and traffic of these areas; b) ripping soil, where feasible, to help support plant growth; c) reseeding other vegetation.
- o Impacts of development and human use shall be minimized in areas of known rare and endangered plants. Trails and other circulation shall be routed so that they minimize intrusion of these areas.
- o A program of monitoring the rare and endangered plants shall be undertaken by the Park Naturalist or other staff in order to note changes.
- o Measures shall be taken to limit the growth of Eucalyptus and Cypress groves.
- o Gorse, Broom and Pampas Grass plants and communities shall be controlled

and removed as quickly as possible. Highest priority for removal shall be given to areas where rare and endangered plants or butterfly habitat are threatened.

- o All efforts shall be made to encourage and protect the rare and endangered butterfly populations on SBM. Known habitat areas shall be protected from indiscriminate circulation and host plants shall be protected and encouraged. Habitat areas and butterfly colonies shall be monitored for positive or negative changes.

Bay Area Air Quality Management District (BAAQMD) This agency regulates stationary sources of potential air pollutents, and is in charge of issuing permits for controlled burns. The main requirement of the BAAQMD is that controlled burning be done on approved burning days only; the HCP will meet all requirements of the BAAQMD.

TABLE II-1
OTHER AGENCIES WHICH MAY HAVE POLICIES
RELATED TO PROJECTS ON SAN BRUNO MOUNTAIN

AGENCY	POSSIBLE INVOLVEMENT
Federal	
Federal Aviation Administration	Navigation Lights on South Ridge
U.S. Dept. of Housing and Urban Development	Low & Moderate Income Housing
Federal Highway Administration	Improvements to Bayshore Highway
Federal Communications Commission	Communications Properties Site
U.S. Dept. of Education	Proposed School Sites
Bureau of Mines	Guadalupe Valley Quarry
Soil Conservation Service	Erosion Control Loans
State	
California Public Utilities Commission	Transmission Line Easements
California Dept. of Transportation	Upgrading of Roads and Highways
California Div. of Mines and Geology	Guadalupe Valley Quarry
Air Resources Board	Mobile Air Pollution Sources

III. ENVIRONMENTAL ASSESSMENT - PRIMARY IMPACTS

A. BIOLOGY

1. Environmental Setting

a. Plants

Several plant communities are represented on San Bruno Mountain. The dominant community types are grassland and native California brush, with lesser extents of introduced trees (Eucalyptus) and brush (gorse). Other vegetation types found only in localized areas include bay/buckeye woodland in Owl/Buckeye Canyons and small wetlands in the Saddle and on Northeast Ridge (See Figure III-1). The extent and composition of the plant community types found on the Mountain is not permanent or in an equilibrium state. The mix of communities now seen reflects the past history of Spanish ranching and surrounding urbanization. The vegetational landscape of the Mountain appears to be changing and the grassland itself changes as brush and non-native species spread to replace grassland.

The grassland contains a mixture of native, mostly perennial grasses and introduced annual grasses, as well as many species of native and non-native wildflowers (also called forbs or broad-leaf species). Examples of the native elements include California needlegrass (Stipa spp), California canary grass (Phalaris californica, blue wild rye (Elymus glaucus), California blue-eyed grass (Sisyrinchium bellum), Iris spp. California poppy, farewell-to-spring (Clarkia rubicunda, johnny jump-up (Viola pedunculata), Broadiaea spp., Lupinus spp, and coyote mint (Monardella villosa). Introduced elements include rattlesnake grass (Briza maxima), silvery hair grass (Aira caryophyllea), fescue (Festuca dertonensis), wild mustard (Brassica campestris) and radish (Raphanus sativa). A complete list of the flora of San Bruno Mountain is given in McClintock et. al. (1968).

The brush community is actually made up of representatives of three distinct recognized woody communities -- chaparral, Northern coastal scrub, and foothill woodland. Chaparral components include Arctostaphylos spp., Ceanothus spp., and Rhamnus spp. Chaparral is fire adapted; many shrubs found within this community are capable of stump sprouting, others produce abundant seedlings after fires. The Northern Coastal scrub community is represented by Baccharis, Ceanothus, Eriogonum, Eriophyllum, Rubus, and Lupinus species among others. Foothill woodland elements include Quercus spp., the California Buckeye and Bay trees, as well as Arctostaphylos spp. and Ceanothus spp. shrubs and several perennial herbaceous plants. Please refer to Thorne in CNPS Publication No. 2, 1976 for a more complete listing of characteristic plants found in each of the communities mentioned above.

The Eucalyptus has spread from the area in which it was originally planted to serve as shade for cattle, or a windbreak. The gorse may have been introduced with cattle feed (animals will feed on the very young plants), or possibly as a horticultural ornamental, for its showy yellow flowers. This plant is extremely hardy; native to the British Isles, it is well-adapted to grow in the foggy, exposed sites on San Bruno Mountain. It is continuing to expand from an original infestation on the Saddle, replacing close to 300 acres of former grassland there in the last 50 years.

The small wetland areas support characteristic vernal pool plants such as rushes, sedges and grasses. The wetlands are an interesting botanical feature created by low-lying pockets of boggy soil, and contribute to the overall diversity of habitats on the Mountain, but are too small to be considered a major ecological component of the study area.

Present Community Distribution and Past History

The distribution of plant communites now found on SBM reflects the ancestral or natural vegetation of the area (coastal prairie, a native perennial grassland) modified by the long-term effects of Spanish ranching, and more recently, by nearby urbanization and the end of grazing in 1965.

Stage 1: Ancestral Condition The ancestral condition before settlement by European man was a coastal prairie of native perennial bunch grasses (Heady et al. 1977). In addition to Stipa (needlegrass), the dominant bunch grass of more inland areas, native coastal prairie contains native species of Festuca (fescue), Poa (bluegrass), Bromus (cheatgrass), Melica (melic grass) and others. Although there are no species lists from pre-settlement times, range botanists today observing remnants of native prairie or areas where the native community has successfully reinvaded annual grassland, have noted that the grasses dominate the landscape and broadleaved species (herbs and wildflowers) are restricted to disturbed sites within the grassland (McBride, pers. comm., 1981).

Brush was probably present but more restricted than it is today, limited to exposed, dry slopes and areas of dissected terrain (Wright, 1971). The brush may have contained many of the same native species present today, representing the northern coastal scrub and chaparral communities, but the many exotic species which now occur in brushy areas, including gorse, would have been absent.

Annual fires are believed to have been important in maintaining the ancestral perennial grasslands (Heady et al, 1977). Nonetheless, fires on SBM probably would have been less frequent. A fire hazard severity analysis presented in the San Bruno Mountain County Park EIR (1976) showed that overall, the Mountain has a low to moderate fire hazard due to a combination of generally cool, foggy weather, and light fuel loading wich results from a high proportion of grassland compared to scrub and woodland. According to Wright (1971) occasional fires, such as those caused by Indians, favor grass over brush. The spread of brush in healthy rangeland is also retarded by the occurrence of cyclical droughts.

The lupine food plants of the Mission Blue probably occurred primarily on rocky outcrops and in zones of recent soil disturbance such as landslides on steep slopes, and were scattered in low density throughout the grassland at such sites as rodent diggings. The Mission Blue distribution probably corresponded with the lupine distribution in much the same manner as we see today. Johnny jump up violets were also scattered throughout the grassland, but the Callippe distribution may have been restricted to those locations where light plant cover and short grasses allowed these butterflies to find their food plants. Off San Bruno Mountain, Callippe silverspot and Mission Blue butterflies probably occured at the locations of their food plants in low densities in many locations on the San Francisco Peninsula, as well as south through the Santa Cruz Mountains, and north through Marin County.

Stage 2: Introduction of Grazing and European Annual Grasses At the time of Spanish settlement (mid 18th century), cattle grazing, and thus European annual grasses, were introduced (Heady, 1977). The European grasses were able to outcompete and almost completely replace perennial native bunch grasses of the coastal prairie. The European grasses had adapted to moderate to heavy grazing pressure over several thousand years in the Old World and were capable of setting adequate seed unless severely overgrazed or grazed too early in the season. Native bunch grasses, on the other hand, were not adapted to grazing and their seed set was markedly reduced. Such perennial plants also generally produce less seed, per unit of biomass in a single season than annuals do. Under grazing pressure alone, without competition from European annuals, the poor seed set of perennial grasses would have allowed brush to spread. Grazing would also reduce the competition between shrubs and the native grass community after a fire, allowing shrub invasion (Wright, 1971).

On San Bruno Mountain the brush probably spread initially after grazing started, but since grazers browse on young brush seedlings, grazing also held brush in check as the annual grasses took over. The net amount of fuel was reduced in the grazed grassland and whatever fires occurred were probably less severe.

The food plants of the Mission Blue most likely increased in density in the grazed annual grassland compared to their abundance in the ancestral grassland for several reasons. Mature lupines are unpalatable to cattle; most were left to flower and set seed while other wildflowers were consumed. Livestock trampling vegetation, particularly in overgrazed situations, resulted in downslope movement of topsoil and increased the area of bare mineral soil favorable to lupine. Many of the nectar plants of both Mission Blue and Callippe are also likely to grow in localized areas of soil disturbance (McBride, pers. comm. 1981). The continuation of grazing over 100 to 150 years probably favored an overall increase in Mission Blue density on the Mountain which paralleled the increased density of its food plants. As other grazed grasslands in the San Francisco Bay area were lost first to row crop agriculture and then to urbanization, the relative importance of San Bruno Mountain to the Mission Blue was further accentuated.

The physical environmental relationships of the violet are not well understood. It is fairly common in several plant communities, and widespread in California. Under grazing, the overall height of the grassland is shorter and the cover less complete which allows more violet patches to be discovered and utilized by Callippe. This impact was most likely reflected by an increase in the Callippe. Thistles (non-native), important nectar plants of Callippe, are also unpalatable to cattle because of their spines, and thrive in grazed grassland.

Since many of the San Francisco Bay Area endemic plants and those found only on San Bruno Mountain (Arctostaphylos spp.) are on rocky outcrops, scrub or chaparral, and not in areas of prime pasture, grazing probably had little impact on these species. Some of them, similar to lupines, may have expanded into grasslands in areas of thin or exposed soil.

Stage 3: After removal of grazing About 1965 (16 years ago) grazing animals were removed from San Bruno Mountain. The relationships between species in the grassland and between the grass and brush communities which had been

maintained by grazing pressure were de-stabilized. The trends established in Stage 3 are probably also representative of the near term (10-50 year) future of the Mountain communities in the absence of development, grazing, and management.

Studies of succession at the brush/grass interface when grazing is removed have been conducted in the Berkeley Hills using maps and aerial photographs prepared between 1927 and 1942 and field observations and aerial photographs between 1952 and 1974 (McBride and Heady, 1968; McBride, 1974). These studies showed that brush -- particularly coyote brush (Baccharis pilularis) begins to invade the annual grassland. The annual rate of Baccharis advance was just over one foot per year. Unfortunately, available aerial photographs of San Bruno Mountain taken between 1946 and 1968 do not provide adequate resolution of brush from grassland areas, so it has not been possible so far to measure the spread of brush in this interval by this means.

The State of California Division of Forestry made available a 1932 US Forest Service map of the major vegetation types on the San Francisco peninsula, including San Bruno Mountain. The 1932 information is shown in Figure III-2 which also shows the vegetation types in those areas (eg. Guadalupe industrial park) which have been urbanized since 1932. The extent of these vegetation types in 1981, mapped from Thomas Reid Associates false color infrared aerial photographs, fieldchecked is depicted in Figure III-1. The numerical change (acreage and percent) in this 49-year interval, calculated by planimetry, is given in Table III-1.

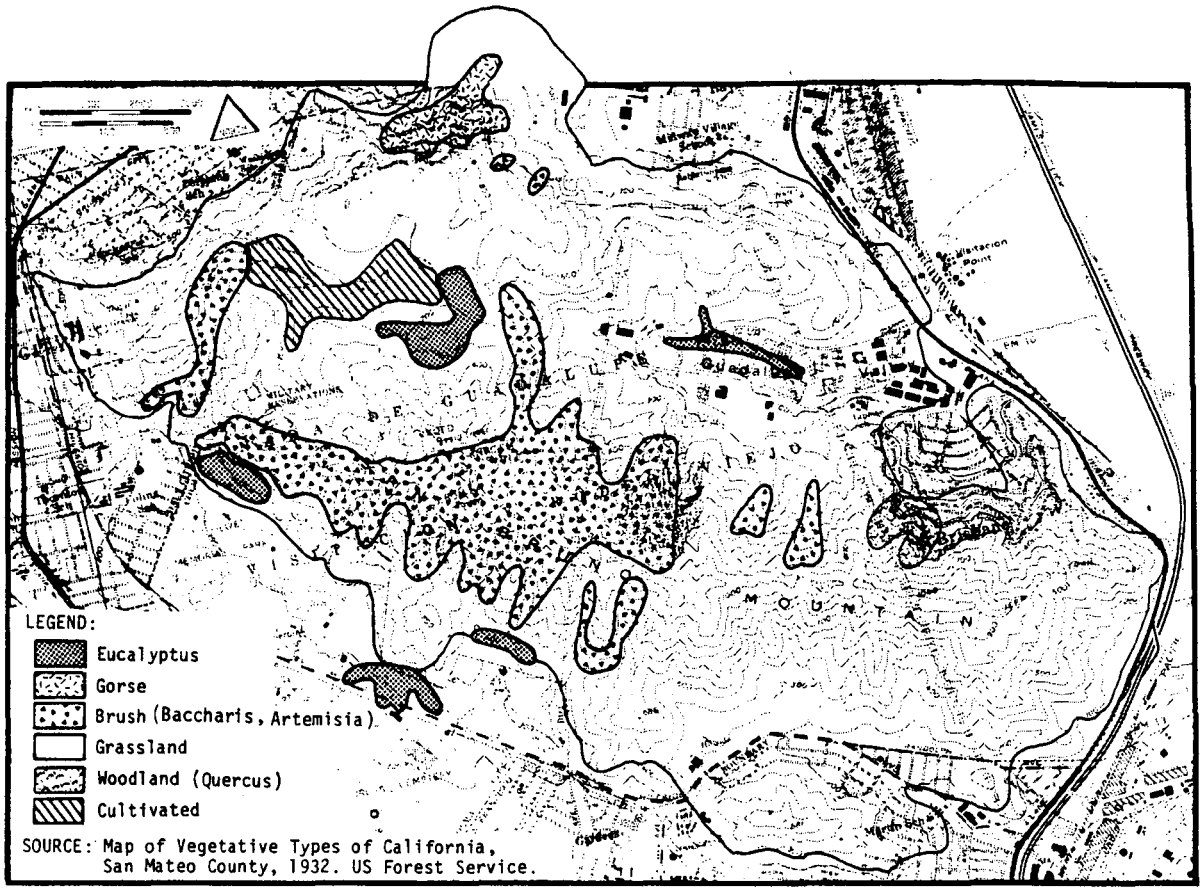
As Table III-1 shows, in 1932 in the San Bruno Mountain area there was more than four times as much grassland as non-grassland; in 1981 the proportions are nearly equal. Almost 950 acres have been taken over by invasive species and native brush; another 1386 have been lost to urbanization. Gorse is by far the most active invader, judging by its proportional increase compared to the other vegetative types, but Ceanothus has expanded significantly on the Main Ridge. In 1932 the area of contiguous grassland on San Bruno Mountain was substantially larger than the entire present day study area of 3564 acres because of the far smaller extent of urbanization on the periphery at that time.

Over the 49-year interval, grassland disappeared at the rate of 19 acres per year. At this rate, one could expect the remaining grassland to be completely replaced in about 90 years. In reality, ecological processes such as invasion of one plant community by another do not follow a constant rate. As the brush expands it presents an ever larger reservoir of seeds and front for expansion, yet as the most suitable habitat is invaded, the less favorable habitat which remains is less rapidly invaded.

The rate of expansion is also affected by environmental factors such as drought, fire, and grazing. Since we have no analysis of intervening data, we do not know the extent to which the process of grassland invasion by other plant types accelerated after grazing ended. We hypothesize that the rate was slower prior to 1965. Fire and cessation of grazing may have worked togeether to cause tha rapid spread of Ceanothus thyrsiflorus (Blue blossom) on the higher, northern slopes of the main ridge. A large fire in September 1964 created conditions favorable for Ceanothus germination; with no grazing, the seedlings survived, eliminating the grassland there over the next decade. Patterns of gorse distribution on the Saddle imply a role of fire in densi-

FIGURES III - 1 AND III - 2

MAJOR VEGETATION COMPONENTS, SAN BRUNO MOUNTAIN -- 1932 and 1981



MAJOR VEGETATION COMPONENTS OF SAN BRUNO MOUNTAIN - 1981

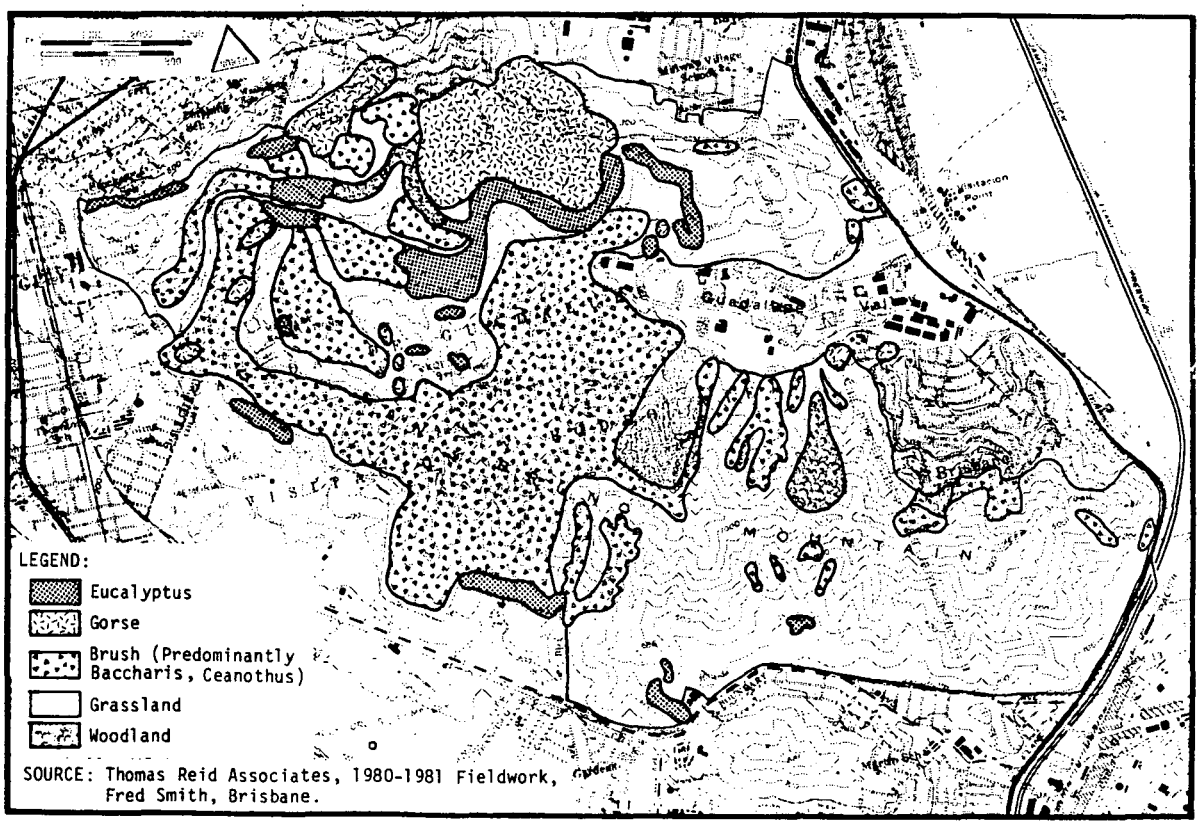


TABLE III - 1
CHANGE IN EXTENT OF VEGETATION TYPES, 1932-1981

	1932 (acres)	Urbanized Since 1932 (acres)	1981 (acres)	Change (acres)	Change (Percent)
Gorse	52	52	334	+282	+545
Brush	600	50	1141	+541	+90
Eucalyptus	124	46	206	+82	+65
Woodland	32	---	72	+40	+125
Cultivated	95[a]		0	-95	
Total, non-grassland	808	148	1753	+945	+117
Total, grassland	4047[b]	1238	1811	-2331	-55
Total SBM area	4950	1386	3564	-1386	

[a] Left out of the non-grassland sum since it was not natural land in 1932.
[b] The area of contiguous grassland in 1932 which is larger than the present study area of 3564 acres.
Source: Thomas Reid Associates Figures III - 1; III - 2

---

fying stands, although on a smaller scale. The thin scattering of Baccharis and poison oak on the north-facing slopes above Brisbane and in Owl and Buckeye Canyons may be due to a relative lack of hot fires there and to the post-grazing phenomena observed by McBride in the Berkeley Hills.

It is doubtful that all of the grassland would be replaced, since there may be localized areas where grassland is ecologically favored. However, it is clear that existing biological processes, unchecked will dramatically reduce the area of grassland habitat in the near future so that the dominant aspect of the Mountain will be brush and exotics.

McBride (pers. comm. 1981) acknowledged that Baccharis spreads both by linear extension and outseeding into expanses of grassland well beyond the brush boundary. The latter type invasion, by both Baccharis and poison oak, is notable on the Northeast Ridge. According to McBride, Baccharis moves in faster on north-facing slopes and deeper soils. Other chaparral types such as Ceanothus or Rhamnus tend to be more successful on southern exposures.

As the area of brush enlarges fuel loading on the Mountain is increased, and larger fires are possible. Baccharis plants are likely to be killed in grass fires if they are under two years old. Beyond this age they will successfully stump sprout unless subjected to an extremely hot fire and burned at the base. Crown fires - those which burn only the above-ground portion of the vegetation, not the roots - are likely only in young scrub stands where leaf litter near the ground is light. A large fire in mature brush would kill Baccharis while allowing many other brush species either to stump sprout or produce seedlings (McBride and Heady, 1968; Wright, 1971). (See Table III-2).

TABLE III - 2
BRUSH SPECIES SEEDING OR STUMP SPROUTING AFTER FIRES

Stump Sprouting Species	Species Producing Seedlings
Arctostaphylos pacifica	Arctostaphylos imbricata
Ceanothus thyrsiflorus	Arctostaphylos montaraensis
Diplacus aurantiacus	Artemisia californica
Heteromeles arbutifolia	Eriogonum californicum
Holodiscus discolor	Grossularia californica
Monardella villosa var. franciscana	Lepechinia calycina
Osmaronia cerasiformis	Ribes malvaceum
Prunus emarginata	
Prunus ilicifolia	
Quercus wizlizenii	
Rhamnus californica	
Rosa gymnocarpa	
Rubus parviflorus	
Salix lasiolepis	
Salvia spathacea	
Sambucus callicarpa	
Symphoricarpos spp.	
Vaccinium ovatum	

SOURCES: McClintock, Knight and Fahy (1968)
Wright (1971)

Extremely frequent or hot fires may prevent stump sprouting or destroy seeds of seeding species. Even with advancing brush such fires are unusual on San Bruno Mountain because of the climate.

The California State Division of Forestry keeps records of wildland fires mostly for the purpose of assessing economic damage to timberlands. Fire records were obtained for San Bruno Mountain for 1980 and 1981, typical of the number, location and areal extent of fires on the Mountain in most years (Dan Dyer, 1981, pers. commun). The records for larger fires (10 acres or more) are mapped and annotated in the Biological Study. These figures show that most fires occur in grassland on the South Slope and South Ridge, and may approach the ridge line but burn little existing brush. The fires are mostly started by young people playing with fire who enter the SBM property from across Hillside Boulevard.

Areas of the Southeast Ridge/South Slope which burn every year will remain grassland if shrub seedlings are killed. (This is true of Baccharis but Baccharis may not be the dominant pioneer invader on the south-facing side). Areas that burn less frequently than every two years will almost certainly progress to a brushland. The recovery rate and plant species composition of brush is also strongly affected by animals (eg. rodents, reptiles, birds) which survive the fire (Hanes, 1977).

With development, particularly of the South Slope parcel, fire frequency and extent may well decrease as the area becomes inhabited, better patrolled, on-site water is available and fire-fighting access is improved. This may also aid the overall spread of brushland at grassland's expense. As Baccharis dominated brushland matures, the Baccharis itself creates a microclimate for other shrub species which eventually outcompete it. Over time species like Baccharis and Ceanothus would be replaced by Rhamnus sp. (coffeeberry), Rubus sp (blackberry), Prunus ilicifolia (holly-leaf cherry) and Toxicodendron diversiloba (poison oak) (Hanes, 1977; McBride pers comm 1981).

No one to our knowledge has studied San Bruno Mountain specifically to understand the relative distribution, abundance and species composition of the native perennial grasses in relation to the introduced species. Half (25 out of 50) of the species of grasses on the Mountain are native species but the casual impression received by botanists looking at the overall flora of the Mountain is that the native grasses are much restricted in extent and abundance compared to the non-native species. Anecdotal evidence from the 1980-81 field study and from others is that native grasses are more common on the South Slope as compared to the Northeast Ridge, possibly because the steep terrain of the South Slope reduced the intensity of grazing. The condition and extent of native grassland is an interesting question deserving further study in conserved areas under the HCP, since it relates to enhancement and restoration of the natural ecological state of the Mountain.

Rare, Endangered/Endemic Plants

Among the 563 total plant species which have been identified on San Bruno Mountain (McClintock et al (1968), 17 are endemic to the San Francisco Bay region or Santa Cruz Mountains and 10 are at the southern limit of their range on San Bruno Mountain. Table III-3 "Endemic and Range Limit Plants lists these species, their collection locations on the Mountain, habitat, frequency and geographic range. Of the endemic plants, three are local endemics -- species of manzanita (Arctostaphylos) that are found only on San Bruno Mountain. Some of the species of bay regional endemics are frequent to common on San Bruno Mountain; this suggests that the extreme climatic and topographic conditions of the Mountain -- strong winds, frequent dense fogs, steep, exposed slopes may have induced the evolution of local races which are particularly adapted to the climatic and soil conditions of the Mountain. Endemic plants are, by virtue of their restricted range already specialized to exploit the particular conditions of a local region; the populations inhabiting San Bruno Mountain may well have carried this specialization to a further extreme.

The occurrence of 10 southern range limit species, but no northern range limit species on the Mountain may be another expression of the same type of evolutionary response to a locally extreme climate: the 10 species whose ranges extend from San Mateo County north, in some cases as far as Alaska strongly suggests that on San Bruno Mountain is the most southerly expression of a more northerly coastal climate. Unlike the endemic plants, all of the range limit species are rare to occasional on SBM -- this level of abundance is consistent with the finding that organisms tend to be common at the center of their range and rare at the limits, since the limits are, by definition marginal environments where they can barely compete with the other species present.

TABLE III - 3
ENDEMIC AND RANGE LIMIT PLANTS ON SAN BRUNO MOUNTAIN

	FAMILY / SPECIES NAME (COMMON NAME)	LOCATION FOUND	DATE FOUND	RANGE	HABITAT	FREQUENCY ON MOUNTAIN
	LILIAECEAE					
1	Maianthemum dilatatum (False Lily of the Valley)	Kamchatka Point	----	Marin Co. n. to Alaska	Rocky outcrop	Rare
	BORAGINACEAE					
2	Allocarya chorisiana	Point San Bruno	4/65	San Francisco to Santa Cruz Mts.	Damp ground	Rare
		Devil's Arroyo	----			
		Ridge Road at Brisbane Powerlines	3/65			
		Upper Colma Canyon	6/67			
	CAPRIFOLIACEAE					
3	Sambucus callicarpa (Red Elderberry)	Near Olivet Cemetery	5/65	San Mateo Co. to British Columbia	Brushy ravine, next to chaparral	Rare
		Base of Devil's Arroyo	3/65			
		Quarry	6/63			
		Ridge Road near West Powerlines	3/63 & 3/66			
	CARYOPHYLLACEAE					
4	Silene scouleri subsp. grandis	East facing slope below Parking Lot	6/63	San Mateo Co. to British Columbia	Grassland	Rare
		Quarry	7/63			
5	Silene verecunda 2-2-1-3	Near summit of mount. below radio towers	5/65	San Francisco to Santa Cruz Co.	Grassland	Rare
	CHENOPODIACEAE					
6	Chrysopsis villosa var. bolanderi (Golden Aster)	Cow Trough Ravine	10/63	Mendocino Co. to San Francisco Bay	Grassland	Frequent
		Eastern end of Ridge Road	7/63			
7	Cirsium quercetorum (Brownie Thistle)	North of Randolph Ave. at Hillside Blvd.	----	Outer Coast Range from Bay Region n. to Mendecino Co.	Grassland	Occasional
		Quarry	6/63			
		Near Nike Base	----			
12	Grindelia maritima (Steyermark) 3-3-3-3	J. H. Thomas	----	San Francisco Bay Region	With coastal scrub	Rare
8	Helianthella castanea 2-2-1-3	Sierra Point	4/65	San Francisco Bay Region	Grassland	Rare
9	Layia hieracioides	Colma Canyon	8/63	Mt. Diablo, Mt. Hamilton, Berkeley Hills, Santa Cruz Mts.	In chaparral	Frequent
		Radio Road	9/63			
		Dairy Ravine	8/63			
		Quarry	7/63			
		Devil's Arroyo	3/65			
13	Pentechaeta bellidiflora 2-2-1-3	Harold Ave., Brisbane	Post 1945	Marin, San Mateo, & Santa Cruz Cos.	Dry rocky slopes In grass or scrub	Rare
10	Senecio aronicoides (Butterweed)	Colma Canyon	3/64	Coast Ranges from San Mateo Co. n., Sierra Nevada, to Modoc Co. & S. Ore.	Grassland, and border of chaparral	Frequent
		East Slope of mt. below radio station	----			
		Top of Mountain	----			
		300 Yds E. of Parking Lot on area burned in autumn, 1964	----			
		Romanzoffia Ravine	5/64			
		Ravine 1/2 mile E of 1314 ft. summit	----			
		South Powerline in area burned in autumn, 1964	3/65			
11	Tanacetum camphoratum 2-2-2-3 (Dune Tansy)	Radio Road	8/63	San Francisco Bay Region	Only one location on mountain	Rare
		April Brook Ravine near Summer Seep	*			

TABLE III - 3 (cont.)
ENDEMIC AND RANGE LIMIT PLANTS ON SAN BRUNO MOUNTAIN

	FAMILY / SPECIES NAME (COMMON NAME)	LOCATION FOUND	DATE FOUND	RANGE	HABITAT	FREQUENCY ON MOUNTAIN
	CRUCIFERAE					
14	*Arabis blepharophylla* (Coast Rock Cress) 1-2-2-3	Near Crocker Ave. Cable Ravine Powerlines Owl's Canyon Colma Canyon Slope SE of 1314 ft. summit Slope above Brisbane	---- 3/65 ---- 4/65 ---- ---- ----	Sonoma Co. to Santa Cruz Co.	Grassy slopes and rocky outcroppings	Frequent
15	*Erysimum franciscanum* (Franciscan Wallflower) 1-2-2-3	Quarry Buckeye Canyon Below top of mountain Lower Colma Canyon Randolph Ave. at Hillside Blvd. South Powerline	6/63 & 6/65 6/63 6/63 6/63 ---- 3/65	Near coast, San Mateo & San Francisco Cos., near Mt. Tamalpais & Bodega Bay; sw. Oregon	Open, rocky, or grassy slopes	Occasional
	ERICACEAE					
16	*Arctostaphylos imbricata* (Manzanita) 3-3-3-3	Summit of Mt., NW. of lowermost radio tower West Powerline Also: Kamchatka Point, Blue Blossom Hill, & Manzanita Dike Cable Ravine Parking Lot Trillium Gulch	2/63 9/63 * * *	San Bruno Hills, San Mateo Co.	Brushy slopes and ridges	Occasional
17	*Arctostaphylos montaraensis* (Montara Manzanita) 2-1-1-3	Adjacent to a rocky outcrop about 300 yds. E-NE of Parking Lot Manzanita Dike	2/63 *	San Bruno Mt. and Peak Mt. in Montara Range	Adjacent to rocky outcrop	Rare
18	*Arctostaphylos pacifica* 3-3-3-3	Ridge Road about 300 yds. NE of Parking Lot on prominent outcrop Manzanita Dike	2/63 *	San Bruno Mt. only	One rocky outcrop	Rare
19	*Arctostaphylos uva-ursi* (Bear-berry)	West Powerline Cable Ravine, about 30 yds. fr. Monterey Pine, lgst. colony on Mt. Kamchatka Point Northern end of West Powerline Ridge	9/63 ---- 2/63 5/64	San Bruno Mt., San Mateo Co.; Pt. Reyes, Marin Co.; along immediate coast to DelNorte Co.; to Alaska, nfld.	On west end of mountain on uppermost ridges	Occasional
20	*Vaccinium arbuscula* (Huckleberry)	Kamchatka Point Huckleberry Ridge	2/63 9/64	Sierra Nevada from Sierra Co. n., to Modoc Co. & w. to Humboldt Co.; to B.C, Mont., Utah	Known only from two exposed rocky outcrops	Rare
	LEGUMINOSAE					
21	*Lathyrus vestitus* (Pacific Pea)	Lower Colma Canyon Colma Canyon Slope SW of Brisbane South Powerline Reservoir Hill Devil's Arroyo West Powerline	6/63 6/65 & 3/64 ---- 3/65 3/65 3/65 3/65	Region around San Francisco Bay	Brushy areas	Common
	ONAGRACEAE					
22	*Clarkia rubicunda* (Farewell-to Spring) 1-1-1-3	Sierra Point Colma Canyon Crystal Cave Canyon Quarry Buckeye Canyon Above Olivet Cemetery	6/65 6/63 6/65 7/63 6/65 6/65	From S.Marin & Alameda Cos. to Santa Clara & Santa Cruz Cos.	Grassland	Frequent

TABLE III - 3 (cont.)
ENDEMIC AND RANGE LIMIT PLANTS ON SAN BRUNO MOUNTAIN

FAMILY / SPECIES NAME (COMMON NAME)	LOCATION FOUND	DATE FOUND	RANGE	HABITAT	FREQUENCY ON MOUNTAIN
POLYGONACEAE					
23 *Chorizanthe pungens* var. *Hartwegii* (Spine-flower) 2-2-2-3	Lower Colma Canyon	6/65	Santa Cruz Mts.& San Francisco	Sandy areas	Rare
SAXIFRAGACEAE					
24 *Grossularia leptosma* (Bay/Canyon Goosebery)	Buckeye Canyon Above the Quarry	8/63 7/63	Sonoma to San Mateo & Alameda Cos. var. on Mt. Diablo and Berkeley-Oakland Hills	----	----
SCROPHULARIACEAE					
25 *Castilleja franciscana* (Franciscan Paint Brush)	South side of Ridge Road near powerlines Colma Canyon Guadalupe Road in Crocker Hills Near Olivet Cemetery Near Cow Palace in Crocker Hills	---- ---- ---- 6/65 5/65	Coast ranges from San Mateo Co. to Sonoma Co.	Grassland and rocky areas	Occasional
26 *Orthocarpus floribundus* 2-2-1-3	Ravine n. of junction of Randolph Dr. & Hillside Blvd. Point San Bruno	---- 4/65	San Mateo Co. to Point Reyes, Marin Co.	Moist grassland	Rare
UMBELLIFERAE					
27 *Ligusticum apiifolum* (Lovage)	Quarry Kamchatka Point Nike Base East facing slope below Parking Lot West Powerline	6/63 3/65 ---- 6/63 3/65	Near coast from San Mateo Co., n.; to w. Washington	Open and exposed grassy or brushy areas	Occasional

* Observations from Roman Gankin's map.

TOTAL FLORA

EXOTICS	159
CALIFORNIA NATIVES	377
ENDEMICS	17
RANGE LIMITS	10
TOTAL SPECIES	563

CNPS R-E-V-D CODE

R (Rarity)
- 1- rare, but found in sufficient numbers and distributed widely enough that the potential for extinction or extirpation is low at this time.
- 2- occurrence confined to several populations or to one extended population.
- 3- occurrence limited to one or a few highly restricted populations, or present in such small numbers that it is seldom reported.

E (Endangerment)
- 1- not endangered
- 2- endangered in a portion of its range
- 3- endangered throughout its range

V (Vigor)
- 1- increasing or stable in number
- 2- declining in number
- 3- approaching extinction or extirpation

D Distribution)
- 1- more or less widespread outside of California
- 2- rare outside of California
- 3- endemic to California

Source: McClintock, et al - A Flora of San Bruno Mountain, 1968
California Native Plant Society, San Francisco South quadrangle
California Native Plant Society, Inventory of Rare and Endangered Plants of California, April 1980
Munz, A California Flora, 1973
Roman Gankin, pers. comm.

Among the species of bay area endemics, three were selected for detailed study in the 1980-81 Biological Study supporting the HCP. These species, San Francisco owl's clover (Orthocarpus floribundus), the sunflower (Helianthella castanea), and the Dolores campion (Silene verecunda) were selected because they are grassland species known historically from the parts of the Mountain which were to be developed under the HCP. The methodology and results of surveys for these species were reported in the Final Report Biological Study (May, 1982). None of the three was found in the survey; possible reasons for their apparent extirpation on SBM include habitat destruction by ORV's and the 1976-77 drought. Successional changes in the species composition of the grassland in the last two decades may also have affected the abundance of these plants.

Insect Host Plants

Other plant species of special interest are those which serve as larval food or adult nectar plants for the animals of concern, which were the subject of the intensive biological study in 1980-81. (See below for discussion of animals.) The plant species are listed below:

Plants - Larval Food

1. Plantago erecta - larvel food plant for the Bay Checkerspot
2. Sedum spathulifolium - larval food plant for San Bruno Elfin
3. Lupinus albifrons- larval food plant for the Mission Blue
4. Lupinus variicolor- larval food plant for the Mission Blue
5. Lupinus formosus- larval food plant for the Mission Blue
6. Viola pedunculata- larval food plant for the Callippe Silverspot
7. Lupinus arboreus - larval food plant for Tree Lupine Moth
8. Orthocarpus densiflorus - larval food plant for the Checkerspot

Other Plants - Host Plant, Rare, Endemic, and Range Limit

1. Lomatium utriculatum - host plant
2. Chrysopsis villosa - Golden Aster; range limit; host plant
3. Cirsium quercetorum - Brownie Thistle; range limit; host plant
4. Eriogonum latifolium - Wild Buckwheat; host plant
5. Brodiaea pulchella - Blue Dicks; host plant
6. Carduus sp. - host plants
7. Silybum marianum - Milk Thistle; introduced host plant
8. Pteridium aquilinum - Braken Fern; host plant
9. Monardella villosa - Coyote Mint, Pennyroyal; host plant
10. Horkelia californica - California Horkelia; host plant
11. Scabiosa atropurpurea - Pincushion Plant; host plant

Two of the butterfly nectar plants -- Chrysopsis villosa and Cirsium quercetorum are also range limit species. The mountainwide distribution and abundance of each of the Mission Blue and Callippe host plants was mapped and is shown in the Biological Study Final Report.

b. Animals

A large number of wildlife species are associated with the plant communities on the Mountain. Faunal inventories have been conducted as part of the background work for EIR's on the Crocker Hills General Plan Amendment (1975) and the County Park (1976). During the 1980-81 Biological Study for Endangered Species, incidental observations were also made of other wildlife. These were reported in the Biological Study report (Table V-6 of the Biological Study). The animals present are those typically expected to inhabit brush and grassland habitats of the San Francisco Bay region, with the notable exception that large mammals -- particularly mule deer, but also coyote or bobcats -- which might be expected in a large expanse of open space such as this are rare or absent. Their exclusion is undoubtedly due to the isolation of the Mountain by surrounding urbanization. Large raptorial birds such as turkey vultures, Cooper's and red-tailed hawks have been observed over the Mountain.

Animals observed or expected, based on the 1975, 1976, and 1981 survey work are listed in Appendix A. In the 1976 inventory of the Crocker (VA) lands, 14 species of mammals, 49 species of birds, 9 species of reptiles and 5 species of amphibians were observed. A roughly equal number of species of each vertebrate group are expected on the basis of the habitat, geographic location and historical observations. Representatives of many taxa of insects as well as other invertebrate groups were also collected and reported in the 1975 study.

In the 1976 inventory of the County Park site 16 mammal species, 38 bird species 13 reptile species and 5 amphibian species were observed. An additional 18 mammals, 22 birds, 7 reptiles and 8 amphibians were listed as expected or possible based on the habitat and the known range of the animal. The Endangered Species Survey, Biological Study reported incidental observations in the grassland study areas of 50 species of animals, most of which were birds.

Species of Concern

The proposed action (Section 10(a) permit) addresses the taking of the Mission Blue butterfly, (Plebejus icariodes missionensis), a federal listed endangered species. The Mission Blue is widely distributed throughout the grasslands on San Bruno Mountain with two major colonies identified in 1981, Southeast Ridge and the Guadalupe Hills. Three other distinct, but much smaller colonies exist, on Radio Ridge, Reservoir Hill and Twin Peaks (2.2 miles north of SBM) (see Figure III-3). Dispersion data strongly suggest that all of the San Bruno Mountain colonies comprise one interbreeding population. About 45% of the Mission Blue population on SBM is found on private lands. A detailed report of the population biology and ecology of the Mission Blue on San Bruno Mountain is given in the Endangered Species Survey -- Biological Study, 1980-81, incorporated herein by reference.

The Biological Study also addressed in detail the Callippe Silverspot (Speyeria callippe callippe), formerly proposed for federal listing as endangered, but dropped pending the results of the Biological Study and Habitat Conservation Plan. Three-quarters of the Callippe population is found on the Southeast Ridge, and the remainder in a second colony on the Guadalupe Hills. Similar to the Mission Blue, observations of dispersal indicate that

both colonies constitute a single breeding population. About one-third of the Callippe population is on private land.

Other endangered species known to exist on San Bruno Mountain are the San Bruno Elfin (Callophrys mossii bayensis) and bay checkerspot (Euphydryas editha bayensis) butterflies. Seven colonies of the elfin are known on the steep north-facing slops of the main ridge where its larval food plant and nectar plant grow in abundance. R.A. Arnold (1980) discusses the population biology and life history of the elfin. In recent years some of the elfin habitat has been destroyed by the quarry, and road construction although the cessation of grazing has favored an expansion of the brush habitat which may have counteracted the losses on an acreage basis. Possible threats to elfin habitat include County Park development and expansion of the antenna farm.

After having been thought extinct, a population of the checkerspot was found in 1981 at the top of the main ridge about 1/2 km west of the eastern transmission line. The only other known colonies of this sub-species exist on Jasper Ridge, in southern San Mateo County. A third population at Woodside , a small community in Southern San Mateo County, was recently extirpated by development. Although the Bay Checkerspot's habitat on Jasper Ridge is restricted to serpentine soil, the population on San Bruno Mountain is not. Because of this the species on the Mountain is thought to be genetically closer to the inner coast range species E. editha luestherae (Murphy, pers. comm. and Murphy and Ehrlich, 1980). Although no serpentine soil is found on San Bruno Mountain, some freshly eroding shales may mimic the toxic metal properties of serpentine soils, thereby creating a suitable habitat for the butterfly.

The Bay Checkerspot has two larval food plants. The primary plant is Plantago erecta. Because this plant senesces before the larvae enter diapause, they use a secondary foodplant, Orthocarpus densiflorus, to continue their development. Both of these plants grow abundantly on grassy slopes and in and around brushy areas. Since the adults fly in early spring no insects were seen by the TRA crew during the Mission Blue and Callippe field research.

The population of the Bay Checkerspot Butterfly is vulnerable to drought. During the recent drought (1976-1977) the San Bruno Mountain colonies nearly became extinct. Hopefully, since it was recently rediscovered, it is making a comeback. Although there are human induced impacts which may threaten its population on the mountain (road construction, park development, etc.), the biggest threat to its survival is the possiblility of another drought. For more detailed information on the life history and population biology of this species please consult Arnold (1981) or Ehrlich (1980).

The San Francisco Garter Snake, (Thamnophis sirtalis tetrataenia), currently on the state and federal endangered species list, is endemic to bogs and marshes in San Mateo County. The Garter snake is thought to inhabit marshy areas on San Bruno Mountain such as the Saddle, but it is both difficult to find and distinguish from a common species (T. sirtalis sirtalis); to our knowledge no recent sightings have been confirmed. Collecting pressures, urbanization, and habitat degradation are all threats to the species survival. Please refer to Barry, 1978 for a more complete discussion of this species.

Two additional rare animals were described in the Biological Study. The solitary bee (Dufourea stagei) is a non-colonial bee first collected on San Bruno Mountain on the Saddle near Reservoir Hill, in 1961 and 1962. Very little is known about the bee's distribution, life cycle, habitat or status as a species, but it apparently not endemic to San Bruno Mountain, as it has been collected from several localities near Santa Cruz. In a 5-day intensive field survey in 1981, conducted as part of the Biological Study, Jim Whitfield, a specialist in the hymenoptera from U.C. Berkeley, collected specimens of a species of Dufourea which proved not to be the rare stagei species, but D. sandhousae, a fairly common and widespread species. D. stagei may be extinct on SBM, or it may be there but so rare that it is difficult to detect.

The San Francisco Tree Lupine Moth (Grapholitha edwardsiana) formerly proposed for listing as an endangered species, is endemic to the San Francisco Bay Region. Today only 10 colonies are known to exist between San Francisco and Ano Nuevo where the species inhabits the dune areas along the coastline where the Tree Lupine (Lupinus arboreus) is found (R. A. Arnold, pers. comm.). Historically, on San Bruno Mountain, the San Francisco Tree Lupine Moth was found in the dune area on Reservoir Hill. Recently, however, this population has been destroyed through increased urbanization and degradation of its habitat. Another colony was recently found in the Brisbane School site area (a portion of San Bruno Mountain west of the Reservoir Hill area adjacent to South Hill Blvd). The Biological Study contained the recommendation that the species' status be evaluated.

2. Project Impact

The Habitat Conservation Plan has two major objectives -- 1) mitigation for the taking of Mission Blue butterflies associated with a certain amount of habitat loss to development and 2) conservation, restoration and enhancement of the ecological value of all of the open space remaining on the Mountain. The two principal activities of the plan -- development and habitat conservation will both have impacts on the existing biota of the Mountain. The habitat loss associated with urban development is the primary adverse impact; the Plan, however, contains numerous restrictions and controls on the development process which are intended to minimize habitat loss or disruption. In addition, the habitat conservation activities of the Plan are intended to compensate for the impact of development, and equally important, to compensate for natural processes and existing human abuses which, in the absence of deliberate intervention, would continue to degrade the quality of the Mountain's biological environment.

To understand the impact of the Plan, it is important to recognize that as projects go, a Habitat Conservation Plan is unusual in that it itself is designed as mitigation for an adverse biological impact -- the taking of endangered species. Therefore, many of the individual mitigations for development, which might ordinary be imposed on the project only after an EIR is prepared, have already been incorporated in the proposed project. The HCP provides for mitigation of impacts caused by both the development and the conservation activities.

a. Development

Within the boundaries of the San Bruno Mountain study area the development envelopes permitted under the Plan will allow the loss of 368 acres of open space, which is roughly twice the acreage of the existing disturbed area, and 11% of the remaining open space within the study area boundary (see Table III-4). An additional 100 acres will be temporarily disturbed by grading activities, but will not be developed. Most of the acreage which lies in the development sites is grassland; however, subdivisions would also remove portions of the eucalyptus groves or patches on the South Slope, Northeast Ridge, Reservoir Hill and "47 Units" projects. The "47 Units" project on the Saddle and the new antenna sites on Radio Ridge will also remove a few acres of native brush. The Rio Verde Estates project will remove several acres of gorse. Development of the turf area of the State Park will encompass a grove of mixed Monterey cypress and eucalyptus. Some of the trees will be removed to provide for the irrigated playing field planned for this area.

Loss of eucalyptus and gorse is not considered an adverse biological impact since both of these vegetation types are non-native, invasive species which have made large inroads into the grassland, as measured over the last 5 decades (Table III-1 above). Although both of these vegetation types have some value as cover for birds and other wildlife the removal of these plants in areas kept as open space would have the overriding beneficial impact of allowing re-establishment of the grassland which contains native species and provides habitat for endangered species. Gorse and eucalyptus control and eradication are thus specific activities called for in the Biological Program of the Plan. The only important ecological impact of the loss of eucalyptus and gorse areas, then, is as a loss of open space which could be restored to a more natural state with greater biological value.

Loss of native brush is not significant since the total acreage is so small (8 acres) and since brush itself is spreading on the Mountain as it outcompetes the grassland.

Loss of the more than 300 acres of grassland is the most significant biological impact of development since it is the grassland which supports the Mission Blue and most other species of concern, and it is the grassland which has been reduced to less than half its extent 50 years ago, and continues to be reduced by the further spread of native and non-native brush and eucalyptus.

Grading and paving of the grassland will mean the destruction or displacement of all of the plants and wildlife which now utilize these areas as habitat. Plants and small ground-dwelling animals such as rodents and lizards will be destroyed, birds will be displaced to nearby areas with similar vegetation.

Plants of Concern

Among the plants destroyed will be representatives of some of the endemic and range limit species which are rare to frequent on San Bruno Mountain. Since many of the regional endemics are fairly widespread on San Bruno Mountain, the loss of 20% of the grassland will not cause their extirpation. The measures taken under the plan to restore the disturbed areas to grassland

TABLE III-4
HCP ADMINISTRATIVE PARCELS - ACREAGE

	PRESENT	HCP			
	DIST	OS	CH	PERM	UNPLA	TOTAL
1. GUADALUPE HILLS						
01. RIO VERDE ESTATES		53	18	35		53
02. CARTER-MARTIN ROAD EXT.		8	4	4		8
03. RIO VERDE HEIGHTS		22	14	8		22
04. PARCEL X		28			28	28
05. PARCEL Y		11	4	7		11
06. PARCEL Z		11			11	11
07. NORTHEAST RIDGE PROJECT		230	138	92		230
08. GUADALUPE VALLEY WEST		49	49			49
09. STATE & COUNTY PARK		288	288			288
10. GUADALUPE CANYON PARKWAY	28	6	6			34
11. TRANSMISSION LINE						40*
12. P G & E		34			34	34
13. ROBERTSON SCHOOL	28					28
14. PARCEL W		14			14	14
15 WATER TANK, GVH	1					1
TOTAL	57	754	521	146	87	811
2. SOUTHEAST RIDGE						
01. QUARRY	78	70	70			148
02. OWL & BUCKEYE CANYON		91	76	15		91
03. BRISBANE ACRES		154			154	154
04. SOUTH SLOPE PROJECT		337	211	126		337
05. COUNTY PARK		575	575			575
06. HILLSIDE SCHOOL	13					13
07. TRANSMISSION LINE						35*
08. JUNCUS RAVINE		162	162			162
TOTAL	91	1389	1094	141	154	1480
3. RADIO RIDGE						
01. ANTENNA SITES	6	16	15	1		22
02. COUNTY PARK		885	885			885
03. GUADALUPE CANYON PARKWAY	14					14
04. TRANSMISSION LINE						28*
TOTAL	20	901	900	1	0	921
4. SADDLE						
01. RESERVOIR HILL PROJECT		104	31	73		104
02. BRISBANE SCHOOL SITE		19			19	19
03. "47 UNITS"		9	2	7		9
04. STATE PARK		204	204			204
05. GUADALUPE CANYON PARKWAY	14					14
06. WATER TANKS, RESERVOIR HILL	3					3
TOTAL	17	336	237	80	19	353
GRAND TOTAL	185	3380	2752	368	260	3565

LEGEND
- DIST: presently disturbed area
- OS: existing open space area
- CH: conserved habitat under HCP
- PERM: permanently disturbed area under HCP
- UNPLA: unplanned area as of May 1982
- * easement not added into totals

may improve the overall chances that these species will persist and more than compensate for the development losses.

The three rare plant species which were surveyed for in the 1981 biological study appear to already have been extirpated from the Mountain, in which case development will have no further effect on them. If, on the other hand, the Orthocarpus floribundus and Silene verecunda still exist in development areas such as Reservoir Hill, the South Slope or the Carter-Martin property, even though they were not detected in 1981, development of these areas can increase the chance of their extirpation. However, if these plants are discovered during the preparation of individual projects EIRs, impacts on them could be mitigated. It is also possible that reservoirs of these species would still exist in conserved habitat areas.

Endangered Animals

The loss of grassland in graded areas will result in the loss of the habitat of 13% of the Mission Blue population and 7% of the Callippe Silverspot population. Using the principles and equation from the theory of island biogeography which allows one to calculate a probability of species loss with each reduction in former habitat area one can hypothesize that habitat losses of this magnitude would result in a 2 to 5% increase in the present-day chance that the Mission Blue will go extinct on SBM, and a 1 to 2% increase in the chance that the Callippe will go extinct. (Please see pages VI-8 through VI-15 of the Endangered Species Survey/Biological Study for a detailed discussion of the extinction probability calculation.) In interpreting these numbers it is important to recognize that the endangered butterflies already face a finite, but unknown chance of extinction due to past development on the Mountain (eg. Guadalupe Canyon Parkway, the Industrial Park, the Quarry) and current threats including ORV vandalism, natural succession within the grassland and further spread of native brush and introduced invasive species. The calculated impact of development is over and above the current threats.

A loss of 300 acres of grassland reflects the mitigation achieved by the dedication of 800 acres of private land to conserved habitat. Without such dedication, the total loss of open space possible if all currently open lands held in private ownership were developed would be 1268 acres. This "unmitigated" impact would result in the loss of 36% of Mission Blue habitat and 22% of Callippe Silverspot habitat. The corresponding increase in extinction probability associated with these habitat reductions would have been 7 to 14% for Mission Blue and 4 to 8% for Callippe.

An additional 200 acres of mostly grassland could be developed within the unplanned parcels. This represents little additional Mission Blue habitat and 10.8% of Callippe habitat, of which 10.2% is in the Brisbane Acres. Since the HCP has a limitation that 40% of Brisbane Acres must be set aside as conserved habitat, at most another 6.8% of Callippe habitat could be developed in the future beyond the 7% lost in currently planned parcels.

Several additional features of the Plan serve to mitigate adverse effects on the two butterfly species. The major concentrations of both species (44% of Mission Blue and 56% of Callippe) are on the Southeast Ridge on County Park land above the major developments (see Figures III-3 and III-4). To maximize the chances that these species will survive, the HCP requires that habitat conserved meet a number of important criteria listed below. The distribution

FIGURE III - 3
GENERAL POPULATION AND HABITAT DISTRIBUTION 1981 -- MISSION BLUE

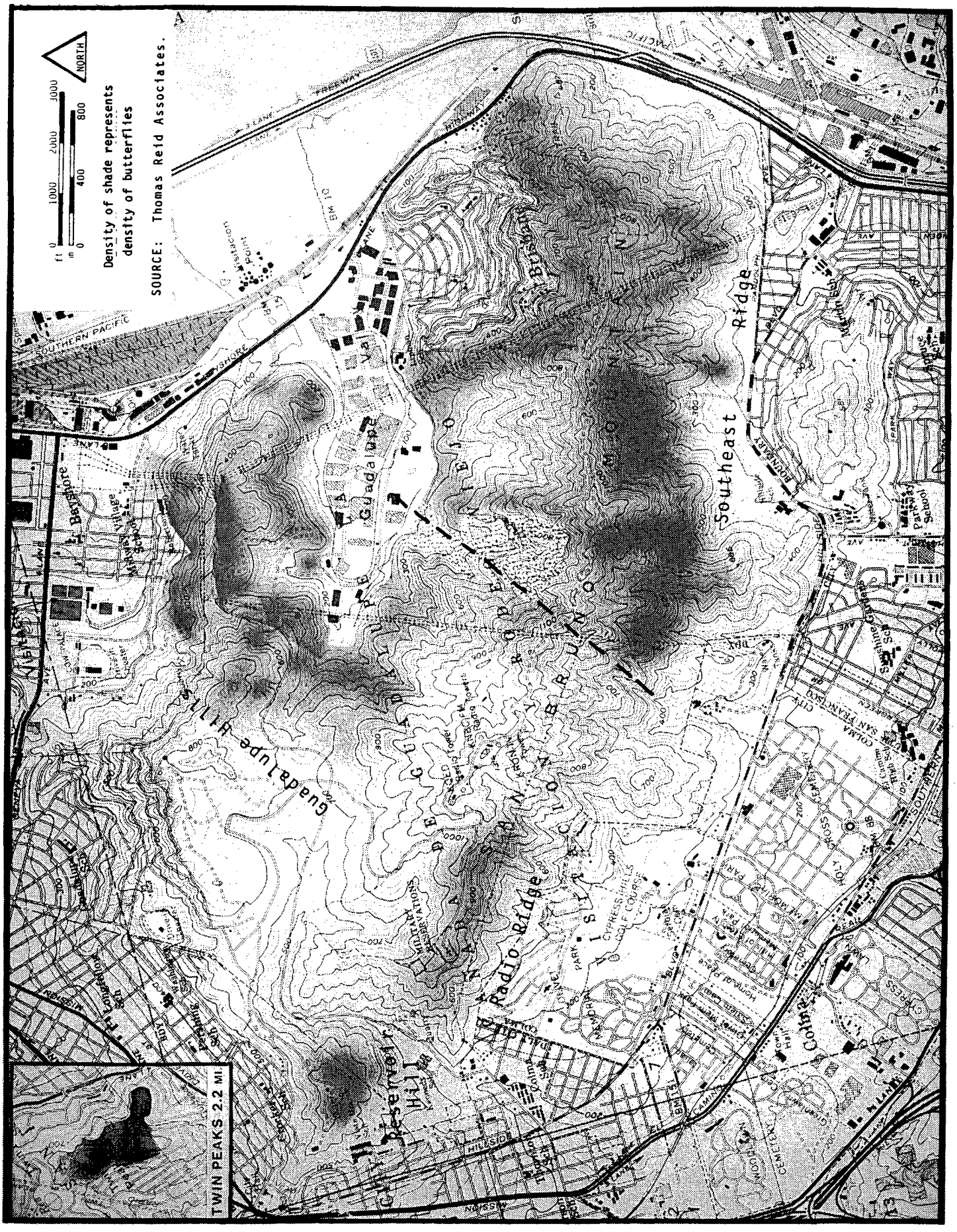


FIGURE III - 4

GENERAL POPULATION AND HABITAT DISTRIBUTION 1981 -- CALLIPPE SILVERSPOT

of the animals on which the criteria are based is the combined distribution of adult animals and host plants (especially larval food plants) which together strongly indicate where all of the life stages would be present. Any areas of host plants where adults were not collected were still considered important parts of the animals' distribution.

1) That as much of the habitat as possible be conserved. The Plan preserves 87% of existing Mission Blue habitat and 93% of existing Callippe habitat.

2) Since the Mission Blue in particular seems to depend on a diversity of habitat types, including low and high host plant density, moist and dry areas, flat and steep slopes and exposed and sheltered areas, it is imperative that the Plan preserve this diversity in its conserved open space. The configuration of permanent open space in the Plan achieves this diversity which has the concurrent benefit of maintaining the full range of ecological conditions on the Mountain which are important to many other species besides the endangered butterflies.

3) Since both butterflies depend on a certain amount of long-distance dispersal between colonies to maintain the entire Mountain as one breeding population, and since their long-term survival on the Mountain may be strongly dependent upon preventing fragmentation of this population, the Plan must maintain contiguity between major open space areas of conserved habitat. The Plan achieves this contiguity by providing wide corridors of habitat within and between developed areas. In particular a corridor is maintained between the Rio Verde Heights project and the Northeast Ridge, and the configuration of development "bubbles" within the Northeast Ridge project conserves large patches of habitat connected by broad corridors. The continuity between the Northeast Ridge and the Southeast Ridge is also preserved.

4) To prevent genetic fragmentation of the populations and the effective loss of areas of nominally conserved habitat, it is also necessary to preserve continuity of open space within conserved habitat on private administrative parcels. Mission Blue may meet their immediate habitat requirements on a scale of 1 or 2 acres; Callippe Silverspot probably require 5 to 10 acres. Therefore, the open space preserved should not isolate habitat areas smaller than 5 to 10 acres since they would effectively not support the animals in the long-term. The juxtaposition of open space and development areas in the HCP preserves this continuity of identified conserved habitat.

5) In addition to food plant stands on hillsides, the Callippe Silverspot requires hilltops or ridgelines to successfully mate and complete its reproductive process. The layout of development in the Plan preserves hilltops and ridgelines as habitat. In particular, all of the ridgeline of the Southeast Ridge is public land and the major hilltops used by Callippe on Northeast Ridge are dedicated to conserved habitat.

In addition to dedication, that portion of the graded area of development sites not used for either structures, streets, utility easements or private lots will be revegetated after construction in an attempt to recreate natural grassland habitat. As of now experimentation is underway on the propagation of lupines and violets, the respective larval food plants of the Mission Blue and Callippe Silverspot, from seed collected on San Bruno Mountain. From the experience of native plant growers (e.g. Clyde Robin Seed Co.) and TRA field

experiments in 1981, the lupines should propagate fairly successfully so that revegetation of Mission Blue habitat seems a viable possibility. If all graded areas were successfully revegetated as Mission Blue habitat and utilized by the butterflies, the net loss of Mission Blue habitat to development would then be 10% rather than 13%.

Propagation of the violet is much more problematical, since its soil, microclimate and growth requirements are not well understood (Seeman Associates, 1980) and attempts to grow it from seed in a greenhouse have met with little success, although R. A. Arnold has propagated violet on a small scale for lab rearing insects, and Clyde Robin Seed Co. has encouraging trials of seed collected on SBM. It is still uncertain whether Callippe habitat could be successfully re-established on graded areas and it may not be possible to mitigate the impact of development beyond the mitigation achieved by conserved habitat dedication.

During the scoping process, specific concern was addressed that the presence of structures could adversely affect butterfly behavior in nearby conserved habitat by altering existing wind patterns, providing artificial shade or otherwise altering microclimate. It is anticipated that the 30-foot minimum buffer around development envelopes which is intended primarily as a firebreak between habitation and areas of possible prescribed burn should also serve to minimize any alteration of wind or solar conditions even at the edge of conserved habitat. The area of the buffer is taken from the building envelope and is not counted as conserved habitat.

As an aspect of wind impact, an obvious concern is that pesticide drift off development sites, particularly for large scale spraying to control a widespread pest, could kill endangered and other desirable species in nearby habitat. This concern has been deliberately addressed in the Plan. All landowners are required to establish covenants and restrictions encumbering development aras in favor of the County or City prohibiting the use of aerial or other large-scale pesticide spraying without prior approval of the Plan Operator. This restriction should guarantee that the decisions on whether to spray, or pesticide chosen, or time of application, etc. should prevent any impact on desirable species.

Concern was also addressed that development on the Mountain would increase the presence of people and domestic animals which would in turn adversely affect conserved habitat by subjecting it to trampling, uprooting, litter and other waste deposition and so forth. While development will introduce permanent residents with near access to the open space and while there will be no permanent fencing to keep them out, it is anticipated that there will actually be a net benefit to open space from the Plan because of continued patrolling of all areas of the Mountain. Currently, the open space on SBM is already subjected to significant vandalism and vegetation destruction by dirt bikers, sight-seers and the like. Nearly all fires are deliberately set by young people entering from the nearby neighborhoods. Domestic animals already have access to the Mountain. The benefit from the Plan is that all areas of the Mountain will be better patrolled by local police and the Habitat Manager and operating crew. This should both restrict abuses from new residents and reduce the amount of existing arson and vandalism. In addition, specific land use controls in the design of public use areas in the County and State Parks such as maintenance of steep trails rather than gradual trails with switchbacks and posting with signs should both

limit the total amount of hiking in the parks, minimize habitat loss for trails and restrict off-trail abuse.

The habitat of the San Bruno elfin should not be affected by the development projects contemplated under the Plan. The elfin colonies are in the chaparral on the main ridge; the one project which potentially could have destroyed elfin habitat, particularly its host plants Sedum and Lomatium, is the Telecommunications Properties Antenna sites. Survey of the proposed sites and access has revealed that they are removed from the known elfin habitat areas (TRA, Langston, and R.A. Arnold, pers. comm. 1982).

The habitat of other species of concern in some instances may be affected by development; in others not. The one location on the main ridge where the bay checkerspot was found is on County Park land which will not be developed. The habitat of the tree lupine moth on Reservoir Hill has already been destroyed or will be destroyed by development. Since the Brisbane School site is unplanned at present, the future of its habitat there is uncertain. It can potentially be conserved under the terms of the HCP (see Management Unit 4-02). Its habitat on Radio Ridge is within the County Park and will be preserved.

Since neither the San Francisco garter snake, the solitary bee, nor any of the three rare plants (O. floribundus, H. castanea, Silene verecunda) were recently confirmed to still occur on the Mountain, it is impossible to predict site specific impacts of planned developments on these species. Since the snake is expected to occur on the Saddle, this land will remain in public ownership as the State Park where its potential wetland habitat will be protected. Therefore, adverse impact on the snake from development is not anticipated. If the rare plants or the bee still exist at their historical locations their habitat could be destroyed by development on Reservoir Hill, on Northeast Ridge (bee only), at Brisbane Acres and on the Rio Verde properties (plants only). Other locations, above the industrial park, on the south slope, and on Radio Ridge would be preserved as part of County Park lands. In addition, the dedication of roughly 700 acres of undisturbed habitat to public ownership could preserve other, as yet undiscovered locations of these species.

b. Biological Program

The Biological Program of the HCP is a detailed, specific set of activities designed to monitor the process of development, mitigate its biological impacts, and to conserve and enhance the value of the remaining open space through a program of biological research, monitoring, and application of habitat enhancement techniques. The objective of the Biological Program is to simultaneously provide for the indefinite perpetuation of the Mission Blue and Callippe Silverspot and for the perpetuation and enhancement of the grassland habitat which supports the butterflies. Guided by the criteria listed in the previous section the program is intended to preserve the unique ecological properties of the Mountain as a biological refuge suporting a high proportion of native plants, local and regional endemics, and the animals which utilize these resources.

Research funded by the Plan trust fund is to be directed primarily at the resolution of biological questions which relate to the optimal working of the Plan conservation strategy itself. These research topics include the ongoing

rate of natural succession on the Mountain, particularly since the cessation of grazing; succession is defined as both the spread of native brush and invasive species, and the change in species composition within the grassland which is probably having the effect of reducing the density of Mission Blue and Callippe host plants. As discussed above, preliminary data indicate that in the absence of brush, gorse and eucalyptus control, much of the grassland itself is in danger of disappearing within 30 to 100 years. A better understanding of the replacement process will lead to a sound basis for long-term vegetation control. Other research topics include the optimum method to propagate butterfly host plants and other native plants, and the most cost-effective methods to monitor endangered species populations on an ongoing basis.

Extensive basic research is outside the scope of Plan funding, but outside academic institutions will be encouraged under the Plan to continue or to initiate programs of research on such topics as the status of the native perennial grassland, the special adaptations and genetics of regional endemic plants, the ecology of the San Bruno elfin, tree lupine moth, and others.

Monitoring is the task, undertaken by the Plan Operator, through the Habitat Manager, of regular observation of biological processes, development and conservation activities on the Mountain. The purpose of monitoring is to assure that the Plan conditions are being met in practice (as opposed to on paper) and to keep an ongoing record of the progress of implementation which will be the basis for periodic re-evaluation of the Plan's success, and modification of its major activities, as needed. The types of activities subject to monitoring include:

a. Mitigation -- compliance with Plan conditions with respect to development areas;

b. Population status of endangered species (and other species) including status of habitat resources such as host plants;

c. Research results and pilot studies of enhancement techniques

d. Conserved habitat enhancement programs

Habitat Enhancement Techniques are techniques of habitat alteration or manipulation identified as having the greatest potential worth in maximizing the value of conserved habitat for species of concern, and in retaining or restoring the natural diversity of conserved habitats on the Mountain. A summary of the major habitat enhancement techniques, their method of application, expected effects, schedule, cost and annual application program is given in Table I-1 (under Project Description).

Techniques which have been widely applied in other applications (eg. range management) in the past, or which have been shown to work in small pilot studies will be given highest priority. When a technique is selected for application on a mountain-wide scale, even then the timing will be very gradual so that, for example, only a few acres of gorse or eucalyptus are cleared in a single season to maximize the effort spent on effective eradication and revegetation, and to minimize offsite (eg. visual) impact. Small-scale manipulation over a long-period of time allows intensive treatment of each enhancement site with respect to brush clearing, debris removal,

herbicide treatment of stumps, uprooting of (gorse) seedlings, greenhouse propagation of host plants and field transplantation including possible watering by drip irrigation during critical growth periods. Intensive effort on areas of manageable size for enhancement increases the chances for success.

The objectives, guiding principles and detailed implementation of the Biological Program are discussed in detail in Chapter III of the HCP.

If successful, habitat enhancement in conserved areas could restore more acreage as endangered species habitat than was lost to development. Eradication of gorse and eucalyptus alone (without any reduction in the 1981 area of native brush) could restore about 550 acres of grassland, as compared to 300+ acres lost to development in the near future, and a possible 200 more acres in the currently unplanned private parvels. Habitat restoration of this magnitude could significantly decrease the probability of extinction for Mission Blue or Callippe Silverspot on the Mountain compared to what it is today.

B. ECONOMICS

While economics is not strictly an environmental impact, the HCP will increase the cost of constructing, owning, and administering development on San Bruno Mountain. The former costs will be bourne ultimately by the home-owner; the latter by local government and hence indirectly by the surrounding community. This EA/EIR is an appropriate document to disclose the economic impact -- in part because of the unusual character of the proposed action, and in part because increased dwelling costs reduce the "affordability" of housing offered on SBM and lead to an indirect social impact.

1. Private Sector Costs and Investment Viability

The action of issuing the Section 10(a) permit will allow 5 major and several minor development projects to take place on San Bruno Mountain. These projects will have to comply with a strict set of regulations set forth in the Habitat Conservation Plan (HCP). Many provisions of the Plan related to the development projects are typical of those required of projects with no endangered species problems. Erosion control measures, revegetation of graded slopes, dedication of portions of the project site for community facilities or open space, and detailed environmental assessments are frequently required as conditions of approval for development projects throughout the Bay Area.

The HCP will require some actions not normally required with typical development projects. These include: formal pre-grading conferences to insure that contractors and bulldozer operators are aware of the extent to which they are allowed to grade, temporary fencing between conserved habitat areas and the graded areas, special species requirements for revegetation, contracting with the Habitat Manager to monitor contruction activities, contributing to the start up funding to implement the early phases of the HCP, and the implementation of a specific operating program within the project site. Although these constraints may increase land preparation costs, they appear not to significantly affect the investment viability of the projects as evidenced by the developer's willingness to proceed with the projects knowing these additional requirements must be met.

In some cases, projects have required plan changes during the preparation of the HCP which may have resulted in minor economic losses. These include: density transfers, boundary modifications with subsequent changes in grading plans, the elimination of some dwelling units to increase conserved habitat area, and the design of buffer areas around the building envelope to guard against grassland fires. Apparently the developers have been willing to absorb these costs in order to go ahead with their projects.

Future residents of the various developmemts will incur minor costs from the HCP. In order to fund the HCP in perpetuity, an annual assessment of $20.00 per dwelling unit will be required. This amount will be adjusted for inflation each year. In addition the development will be encumbered by certain covenants, conditions, and restrictions limiting use of pesticides, and requiring maintenance of buffer areas around the development to protect dwelling units from fires occuring in conserved habitat. These CC&R's may have a minor effect on the marketability of the units. This effect, however, may be offset by the increased marketability caused by the buyer's knowledge that no infilling will be allowed in the open space around the developments.

Finally, home buyers might be affected by the higher sale price of units as the developers attempt to pass on the costs of the HCP. The increased cost varies from site to site. The Northeast Ridge reflects the most severe constraint and the HCP contributes to a site layout which may increase the cost of a new unit by 5% to 10%. Elsewhere, the effect is less, probably less than 5% for Rio Verde Heights, 2% for South Slope, and 1% for the others. The additional development costs indirectly affect the selling price of the dwelling. Builder/developers generally "sell to the market", assembling a package of dwelling type, amenities, and financing to meet demand and charging as much as possible consistent with an acceptable sales rate. Depending on sales conditions, the additional costs will be bourne partly by the buyer, partly by the developer. On the Northeast Ridge, the increase may significantly affect the affordability of the units and change slightly the income class required for new home purchase there. Elsewhere the increase is probably insignificant by comparison with the many other factors (such as mortgage rates, availability of loans, etc.) that determine a buyer's ability to purchase new housing.

2. Fiscal Impact on Local Governments

The local governments of Brisbane, Daly City, South San Francisco, and San Mateo County have certain requirements set forth in the HCP. These requirements may result in minor fiscal impacts. HCP related meetings and paperwork processing may increase administrative time for existing City and County staff. Established programs may incur additional minor costs (i.e. building inspection or public works), and public services, such as police and fire fighters, may be affected by the HCP apart from the additional services required by the developments themselves. The County may incur slightly higher fiscal impacts due to costs of administering the Plan (i.e. the process of hiring Habitat Manager, processing personnel activities, etc.).

In addition to these unavoidable costs, there may be other optional costs incurred by local governments or other public agencies in the form of in kind services. These services could include the use of the Parks and Recreation Department's personnel or equipment for help with special projects, the use of laborers from County community service agencies or students from local schools for help with large scale projects, or the use of public works heavy equipment for scraping or raking.

The City Managers of the local governments affected by the Plan estimated the costs of administering the HCP to assess fiscal impacts. The costs fall into three categories: 1) specific costs of administering the plan itself; 2) additional costs to already established programs which now must consider the HCP; and 3) optional provision of direct, or in-kind services. Generally, it appears that the HCP will introduce minimal costs on each of the Cities. In most cases, the activities set forth in the Plan would be absorbed by existing staff and would not cause any budget increases. The fiscal impact on San Mateo County would be slightly higher than for the cities, however, it is still considered minimal (Bill Rozar, pers. comm.).

Philip Gorny, Senior Planner for the City of South San Francisco estimated costs for an initial five year period at $17,600. This represents an average annual cost of $3,520: $900 - Technical Advisory Committee, $700 - trust fund meetings, etc., $300 - pre-grading conferences, $1,300 - field

work, and an additional 10% of the total, or $320, for contingencies.

Brad Kerwin, City Manager of Brisbane, did not provide numerical estimates; he felt that most costs of the HCP were sufficiently small so as not to extend beyond normal plan review procedures.

Don Fleming, Community Development Director of Daly City, estimated that the specific cost to administer the plan would not exceed $1,500 annually; additional costs of $100 to $200 may be incurred by established programs to comply with provisions of the HCP; finally, aside from added costs to service the developments allowed by the Section 10(a) permit, he did not feel that provisions of the HCP would increase costs of existing fire and police protection services. The total annual estimate is $1,700.

3. Economics of Plan Operation

The funding of the HCP is divided into three phases: start up, construction phase, and permanent funding. The start up funding ($25,000 annually) will be phased out as the permenant funding is established. The purpose of start up is assure that the plan operation is in place and that the habitat manager is available to monitor pre-construction activities and proceed with high priority enhancement.

The construction phase funding, which will supplement the start up funds, will be provided by the developers in the form of a contract with the plan operator for the Habitat Manager to monitor grading and reclamation activities and implement project related enhancement activities in nearby areas, and a contract with a Plan Operator recommended native seed dealer to revegetate cut and fill areas. Both the start up and construcion funds will be phased out as individual projects are completed and assessments are made.

The permenant funding will be provided through the San Bruno Mountain Habitat Conservation Trust Fund. The fund, which will be made up of the annual assessments imposed on the dwelling units, will cover the cost of Plan Operation. This will include the salary of the Habitat Manager, costs of additional labor needed during butterfly flight season or for special projects, consultation by scientific advisors, and expenses such as equipment costs and transportation for the Habitat Manager. Table III-5 shows a breakdown of the approximate costs of Plan Operation for a minimum and maximum scenario.

The Habitat Conservation Plan Steering Committee determined that the assessments on the individual dwelling units should make up a fund which would meet the minimum amount required to carry on the basic provisions of the Plan. An assessment of $20.00 per dwelling unit was agreed on. Therefore, if all projects currently proposed on Visitacion Associate's land reach total build out (3,021 units), the total annual assessments would amount to $60,420 (see Table III-6). This amount would provide the minimum funding needed to guarantee plan continuity by maintaining personnel and a low scenario enhancement program. It is hoped that the County and other public agencies through in kind services, Universities and private organizations, can contribute labor, equipment, or scientific advice, which can supplement the basic Plan provisions so that the maximum scenerio is approached.

Table III-5
PLAN OPERATION COST SCENARIOS
(1983 Dollars)

Item	Low (Minimum)	High (Maximum)
Habitat Manager*	30,000	30,000
Labor*	10,000	30,000
Consultants	15,000	20,000
Expenses	5,000	20,000
Total	60,000	100,000

* Wages and Direct Costs
Source: Thomas Reid Associates (TRA) estimates

It should be noted that the Plan Operation funds include the amount needed to carry out the HCP only. Any other biological programs proposed for San Bruno Mountain would require separate funding from traditional sources. Possibly other programs can be coordinated with the HCP, to the benefit of each.

Table III-6
RESIDENTIAL PROJECTS NOW PLANNED -- DWELLING UNIT ASSESSMENT

Project	Units	Amount of Annual Assessments*
1. Guadalupe Hills		
a. Northeast Ridge	1,250	$25,000
b. Rio Verde Heights	160	$3,200
c. Rio Verde Estates	483	$9,660
2. Southeast Ridge		
a. South Slope	745	$14,900
3. Saddle		
a. Reservoir Hill	336	$6,720
b. 47 Units	47	$940
Total	3021	$60,420

* Figures are in 1983 dollars

The trust fund is dependent on all currently proposed projects reaching total build out. If some of the planned units are not built, particularly after grading takes place, there could be a major impact on the overall plan

implementation program. The Plan does not provide for alternate funding strategies. In addition, it does not provide for assessments on other land use types (i.e. commercial, retail, office uses) or on presently unplanned parcels for which development is contemplated. The appropriateness of the assessments for these unplanned parcels should be determined during the planning process.

C. GEOLOGY, SOILS AND HYDROLOGY

Several of the Habitat Enhancement Techniques of the HCP are expected to effect the soils, hydrology, or geology of the undeveloped portions of San Bruno Mountain. These include chaining and scraping/raking, burning, rock spreading, and the reintroduction of grazing. In addition, the individual development projects, which will be allowed by the issuance of the Section 10(a) permit, will have impacts on geology, soils, and hydrology. Specific significant impacts for each project are discussed under the in Chapter IV of this EA/EIR.

1. Environmental Setting

San Bruno Mountain (SBM) is an uplifted fault block made up of two northwest trending ranges. The main range on the south is 4 1/4 miles long, and reaches a maximum elevation of 1,314 feet at Radio Peak. The smaller northern range is 2 3/4 miles long, with a maximum height of 850 feet. The two ranges are joined at the Saddle near the northwest end of Guadalupe Valley.

The Hillside Fault (to the southwest) and the City College Fault (through Visitacion Valley to the north) lie on each side of SBM. Neither is known to be active (LSA, 1981). A magnetometer survey of the Hillside Fault was completed by Cooper & Clark (1972). Many small inactive faults are found throughout the mountain (LSA, 1981), and such faults are relatively common to the hilly portions of the San Francisco peninsula. The nearest known active fault, the San Andreas, is 4 1/2 miles to the southwest. Future earthquakes on the San Andreas or Hayward Faults could cause strong ground movement on SBM. Site-specific seismic hazards addressed in specific EIR's on SBM are summarized in Chapter IV. Issuance of the requested 10(a) permit will have no direct effects on seismic hazards.

A preliminary geological map, which included SBM, showing fault traces and rock types was published in Bonilla (1971). A geological map of Northeast Ridge is included in the Proposed Development Plan for NER.

Franciscan sandstone (greywacke) with minor beds of shale are the main rock units on SBM. Small outcroppings of serpentine may be found along the Hillside Fault shear zone. The depth of the highly weathered rock and soil areas varies from three to 25 feet, with an average of ten feet. Beneath this highly weathered zone lies a less weathered zone down to a typical depth of 40 feet. Layers of very hard rock several feet thick are found within these weathered zones. (C & C, 1972). Colluvial deposits may be found in valley floors. In the two main ravine and valley areas near Crocker Industrial Park, these colluvial deposits may be as thick as 75 feet (LSA, 1981).

Crushed rock aggregate from the Guadalupe Valley Quarry is the only currently mined mineral product on SBM. The quarry has been in operation since about 1896. The HCP and 10(a) permit will have no impact on quarry operations. Several unsuccessful claims for gold were filed in the Crocker Hills just south of the county line. The gold occurred in quartz veins in the greywacke (Fahy, in McClintock). Quartz veins are common throughout SBM, and on the ridge above Fern Rock, amethyst also occurs (p. 16, Co. Pk GP). The open space element of the South San Francisco General Plan (Hahn, Wise and

Assoc., 1972) mentions that "oldtimers still recall that copper was once mined north of Hillside Blvd., opposite Holly Avenue, on San Bruno Mountain."

While there is no evidence of any major bedrock landslides on SBM (LSA 1981 and Prop. Dev. Plan, NER), a number of small landslides are known. The most recent was during the major storm of January 1982, when a destructive landslide slid into a trailer park in Daly City. Aerial photos taken just after this storm are available from the United States Geological Survey (USGS). Many of the small slides and slumps are caused directly by man's activities: grading, over-steepening of slopes, and road cuts. Most of the existing slides are generally shallow, and could be stabilized and repaired easily (C&C, 1972). The slopes in Guadalupe Valley do not show as much slope instability (see Figure III - 5).

Two types of loamy soils are found on SBM. The Gaviota eroded Rockland association is a thin, rocky loam found on steeper slopes. The Los Gatos Hills association is a thicker clay loam found on gentle slopes of SBM (LSA, 1981). The soil depth varies from a few inches to over three feet.

San Bruno Mountain is drained by five different watersheds. Colma Creek and Guadalupe Creek are the main intermittent streams which drain the Mountain. The three lesser drainages include Visitacion Valley, Diamond Valley, and Sierra Point. A small portion of the subject area, northwest of Reservoir Hill, probably drains toward Lake Merced. These watersheds are illustrated in Figure III - 6 and the amounts of SBM included in each drainage are presented in Table III - 7. During the rainy season, other short intermittent streams flow down the ravines and aid in drainage.

TABLE III - 7
WATERSHEDS IN PERMIT AREA

Colma Creek	34%
Guadalupe Valley	31%
Diamond Valley	13%
Visitacion Valley	10%
Sierra Point	10%
Lake Merced	2%

The Colma Creek Watershed drains the largest area of SBM which is covered in the HCP, including the entire County Park and a portion of the State Park. The Guadalupe Valley Watershed drains the second largest portion, including the southern portion of Northeast Ridge, the Quarry, Brisbane (excluding Gladys Ravine), and Owl and Buckeye Canyons. The lower part of Guadalupe Valley (the industrial park) now drains into Guadalupe Valley Municipal Improvement District (GVMID) storm drain system, which empties into into Brisbane Lagoon through a 60 inch storm sewer (Quarry EIR). The Paradise Valley and Sierra Point watersheds together drain the South Slope development area.

While there is no year-round water on SBM, a number of springs and seeps are known. Some of these wet areas include the freshwater bog near the juction of Guadalupe Valley Parkway and Radio Ridge Road, and the two draws in Guadalupe Valley on the south side of Northeast Ridge. These areas are shown

FIGURE III - 5
LANDSLIDES

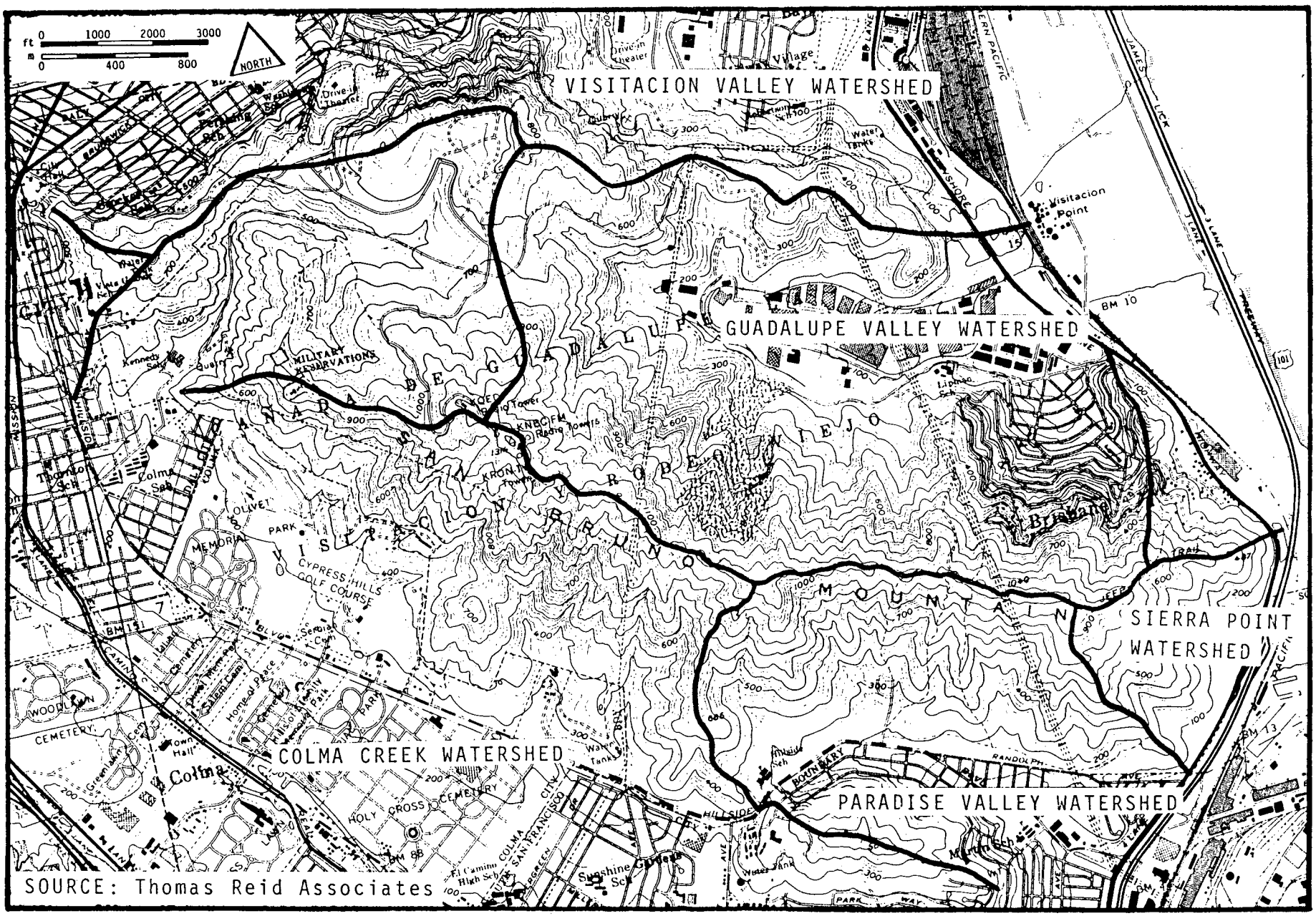


FIGURE III - 6
WATERSHEDS

on the dessication map in the Biological Study. The lush vegetation in these areas indicate a greater water holding capacity than other areas of SBM.

The lushness of the vegetation on SBM is a good indicator of the moisture content directly underneath each area. Figure III-19 of the 1981 Biological Study shows these areas of greater ground moisture very well. The water storing capacity of the Mountain is probably due to its loamy soils (LSA, 1981).

In an undeveloped state, the soils of SBM soak up water during rain storms and gradually release them as is illustrated by a time lag between periods of peak precipitaton and peak runoff. As development is allowed to occur subsequent to the issuance of the Section 10(a) permit, more water will run off directly as a result of an increase in disturbed soils and impervious paved areas rather than being absorbed in the undisturbed soils. The peak runoff periods will then occur closer to the peak precipitation periods during and after development (LSA 1981).

Gullies occur in many of the ravines which surround SBM, especially in areas where sandy soils occur, or where runoff from paved roadways or compacted dirt roads is channelized. Severe gullying appeared after the recent heavy storm of January, 1982. Guadalupe Valley has gullies up to twelve feet deep (LSA, 1981). Deep gullies also occur in Juncus Ravine. The introduction of eucalyptus in the sandy area across Guadalupe Creek has prevented further erosion in that area (Co. Pk. EIR) therefore, the elimination or thinning of eucalyptus as a habitat enhancement technique in this area should consider the high erosion potential of these sandy areas. Gullies are located on the east side of the mountain alongside Old Bayshore Highway and on the northern and southern perimeters of SBM (C&C, 1972). See Figure III - 5.

Information on sedimentation, runoff quantity, water quality and timing for the Colma Creek drainage was described in Knott (1973). A series of sediment traps are used to prevent sedimentation of lower Colma Creek (Co. Pk. EIR, pp. 26-29 for drainage, sedimentation rates and water quality Colma Creek). No data is available for the Guadalupe Valley drainage.

Sediments from developments in the Guadalupe Valley and Northeast Ridge areas will be deposited in Brisbane Lagoon (Prop. Dev. Plan, NER). By granting the section 10(a) permit, and allowing development to occur on SBM, the sediment load to Brisbane Lagoon will temporarily increase during project construction, and should decrease after all development is completed. Preservation of the remainder of SBM in an undeveloped state will prevent further increases in silt runoff and storm drainage due to development.

2. Impacts

Adoption of the HCP by San Mateo County and granting of the Section 10(a) permit by the U. S. Fish and Wildlife Service will allow the development of portions of SBM. Such development will affect the soils, hydrology, and geology of the mountain in several ways.

Surface runoff from rainstorms will be increased in areas which will be allowed to be developed due to the granting of the section 10(a) permit. Some degradation in water quality in receiving waters (Brisbane Lagoon, Colma

Creek, etc.) is inevitable after development due to small amounts of fertilizers, oil, grease, and soaps which will find their way into the storm drain systems.

Drainage will be altered by the construction of culverts, ditches, and the hook-up of storm drain systems. Specific information on these drainage modification should come from each potential developer. Impoundments may be formed behind structures built in each development. This will result in a change in the moisture content of the soils, and possible soil saturation during heavy runoff periods. This effect is largely confined to the developed areas which are generally down slope from conserved habitat.

Grading at improperly steep angles may result in further gullying and erosion on SBM. Evidence of this can be found along the roadcuts on Guadalupe Canyon Parkway.

Development on unstable geological deposits, such as old landslides, may cause new downslope movement to occur. Often development cuts off the "toes" of slopes, which is a prime cause of landsliding. This form of enginneering failure could affect habitat upslope from development by a gradual erosion or from an attempt to re-engineer the slope after construction.

Sedimentation may be increased by several of the habitat enhancement techniques mentioned in the HCP. Gorse removal, eucalyptus thinning, and controlled burns would all disturb the surface of the mountain and would increase runoff and siltation if not properly accomplished.

Chaining and scraping/raking is to be done in the late summer and early fall, and is to be followed by a seeding program. Early rains, or problems with seeding and revegetation may cause gullying, or lesser forms of soil erosion.

Burning, either with or without reseeding, may cause erosion if revegetation does not occur in time before the rains. It would also cause nutrients to be returned to the soils.

Rock spreading as a means of modifying the soil on SBM to create favorable habitats for Lupines has never been tried before for this purpose. The spreading of aggregate rock by tractor and rake would change the physical makeup of the soils on which it is placed. The effects of this habitat enhancement technique on erosion or soil chemistry is unknown at this time.

The reintroduction of grazing on SBM could cause erosion problems only if improperly done (overgrazing). Grazing occurred on SBM for at least 100 years prior to 1965.

Another habitat enhancement technique not now contemplated is to creating artificial hilltops from grading spoils. This would require about 20,000 cubic yards of fill. To prevent erosion, this should be done in conjunction with seeding.

Many of the impacts of the HCP on soils and hydrology are beneficial. The amount and the manner of grading will be strictly controlled. The total amount of grading would be minimized by the HCP. Without the HCP, proposed development would have led to the grading of several hundred acres of land

that the HCP will conserve. The erosion and siltation prevented by protecting this land will offset much of the impact of HCP activity.

Even if SBM is left in a totally undeveloped state, runoff and sedimentation problems may occur aroung the base of the mountain. During the severe storm of January, 1982 large amounts of water and silt washed off Reservoir Hill into Daly City, and across Hillside Boulevard in South San Francisco. Sandbags were used around Hillside Blvd. to halt the flooding.

D. CLIMATE AND AIR QUALITY

1. Climate

The San Bruno Mountain climate is similar to that of the nearby Pacific coast: westerly, diurnal winds are light in the morning hours, and become stronger in the afternoon. In the summer months the coastal fog usually covers the higher elevations of the Mountain by the afternoon or evening. Because of its irregular topography not all parts of the Mountain are subject to the same weather at the same time; while it could be cold and foggy on the upper slopes, it may be sunny and warm on the lower slopes.

The topography, and to some degree, the vegetation dictate the wind patterns on the Mountain. At the peak, the winds are predominantly southwesterly (see Figure III-7). The patterns on the lower slopes are difficult to predict and little historical data is available. Typically, once winds are caught by the groves of trees or steep ridges, their direction and speed is changed, creating the microclimates which are found on the Mountain. For more discussion of weather on San Bruno Mountain, see McClintock, Knight and Fahy, 1968, Larry Seeman Associates, 1981 and SWA Group, 1975.

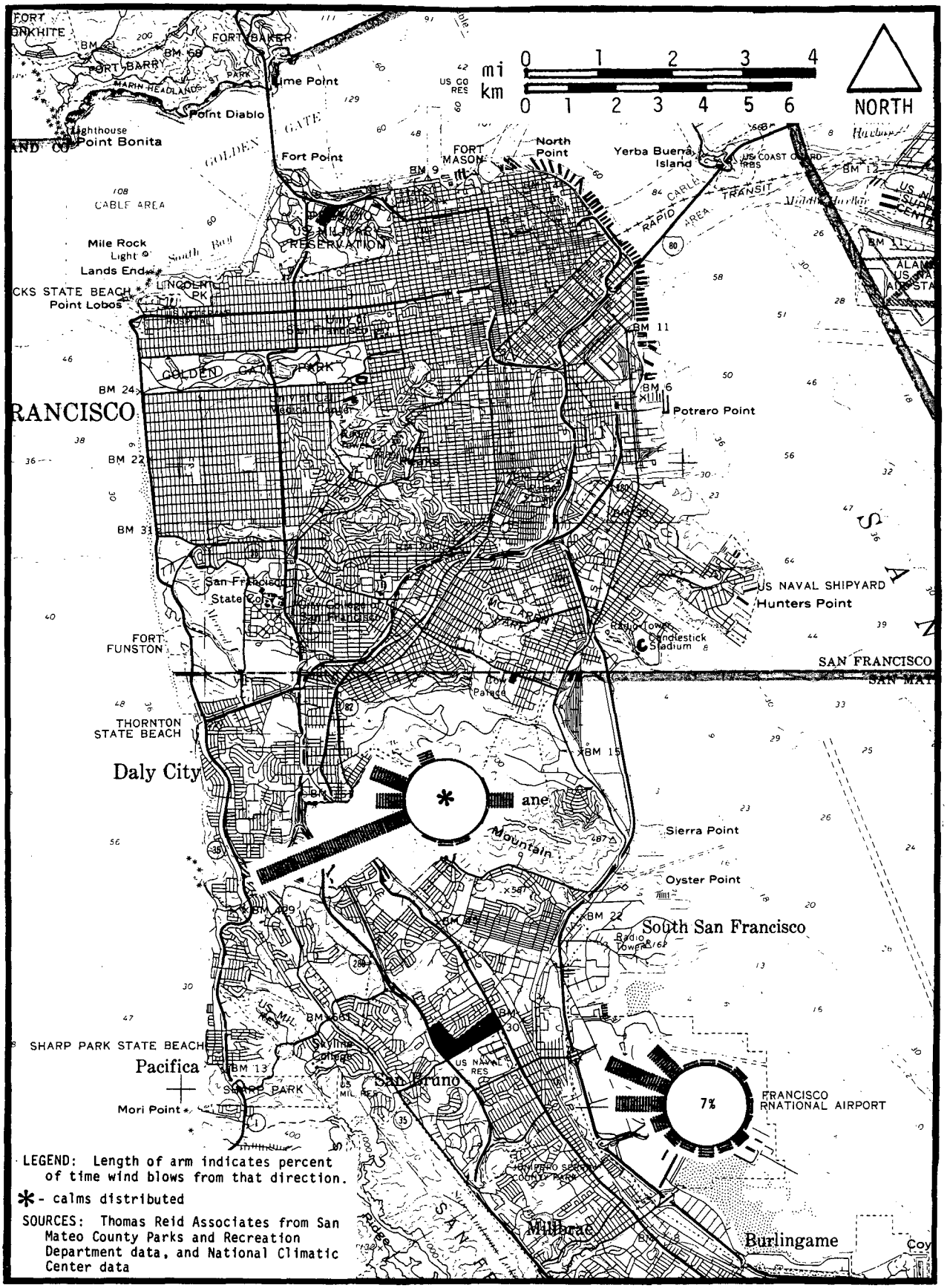
Habitat Conservation Plan activities are not expected to affect the overall climate of the Mountain. However, vegetation removal, such as stands of trees or brush will affect the microclimatic conditions by changing wind patterns, sunlight intensity, and patterns of shadow. Permitted development will also have an effect on microclimate in this way.

2. Air Quality

San Bruno Mountain does not currently have any air quality problems; it is relatively isolated from external pollutant sources, it is not heavily used itself, and it is characteristically windy and hence well ventilated most of the day. On the Mountain itself there are three sources of air pollution: the quarry, vehicular traffic, and grassland fires. Of the components measured to determine air quality, ozone (O_3), particulate matter (PM), nitrogen oxides (NOx), sulfur dioxide (SO_2) and carbon monoxide (CO), only particulate emmissions have a potential to cause air quality standards to be exceeded on the Mountain. Although, no sources significantly affect local air quality, all sources contribute to regional air quality problems. In San Francisco from March 1978 to September 1980, federal standards were exceeded twice for CO and once exceeded for suspended particulates; state standards were exceeded three times for particulates. No excesses of ozone, nitrogen dioxide, or sulfur dioxide were recorded.

The quarry is currently in compliance with Bay Air Air Quality Management District (BAAQMD) regulations. In 1975, URS Research studied air quality adjoining the Quarry and found CO, O_3, NOx, hydrocarbons, and probably particulate matter are found in lower concentrations than at the urban San Francisco monitoring station used by the BAAQMD. In June of 1982 the San Mateo County Planning Commission set a termination date for quarry operation as of December 1991. That decision is being appealed to the Board of Supervisors.

FIGURE III - 7
WIND ROSE



Grassland fires are also an existing source of air pollution on San Bruno Mountain (see Table III-8). Typically, several hundred acres of grassland burn each year. If accessible, fires on SBM are extinguished immediately, otherwise they are allowed to burn until a ridge or fire break is reached. This policy will continue unless the fire threatens an area of the Mountain which is particularly biologically sensitive, is a part of the ongoing habitat enhancement program, or if the BAAQMD prohibits burning on that day because of air quality problems.

The Habitat Conservation Plan includes activities which may affect the existing air quality of San Bruno Mountain. The primary impact would come from the prescribed burning of the gorse (Ulex europaeus), and the crushing for fuel preparation in conjunction with burning. Other impacts result from grading in development areas permitted by the Plan. Phasing of grading so that only one individual building area is graded each season will mitigate impacts of air quality and erosion. Secondary impacts of the Plan on air quality, such as increased automobile traffic which will be connected with the development made possible by the Plan, are discussed in Chapter IV, and will be given more indepth consideration in individual project EIRs.

Gorse has a higher fuel load than grassland - 18 tons/acre versus 2.2 tons/acre - so it will emit more pollutants when burned. Over the course of a year accidental or arson-set grassland fires would still contribute more pollutant to the air basin than would the controlled burning because hundreds of acres are likely to burn in an uncontrolled grassland fire, whereas only tens of acres are proposed for controlled burning in the HCP. It is likely that the development of the South Slope area will significantly decrease the number of arson fires which occur every year since this is where the majority of the fires start. Therefore, the HCP could probably result in a decrease in wildland fire related emissions from SBM.

The gorse burning process includes crushing the plants, and creating a thirty foot fire break around the area. This disturbance would cause 0.42 tons of particulate matter in a typical year (4 acres graded in two days work) and 3.4 tons in a high activity year (12 acres graded in six days of work). The AP 42 factor used (1.2 tons/acre/month) includes machinery emissions and the dust forced into the air during their operation. Converted to pounds, this equals 840 pounds per year if four acres are graded, and 6800 pounds per year if 12 acres are graded.

It is probable that burning gorse will have an immediate, noticeable and short-lived impact on the local air quality, but will have little impact on a regional scale unless considered cumulatively with other sources. Much of the impact depends on the time of year of the burn, the prevailing winds, and the methods used. If the gorse is crushed in place rather than bulldozed into piles, there could be less of an impact; crushing involves less grading and the combustion of crushed plants would not be as complete as those that are piled and burned.

The majority of the controlled burning will take place through the California Division of Forestry's Chaparral Management Program in conjunction with the San Mateo County Parks and Recreation Department, and will be subject to the requirements of the BAAQMD. These requirements include the removal of locally dumped debris which may a pose potential hazard if burned. In addition, burning would only be allowed on "window" days when meteorologic

conditions are correct (Bob Matson, BAAQMD, pers. comm.). The meteorologic conditions, particularly with regard to wind, will dictate what areas are most affected by the burn activities.

Topography and vegetation effect wind patterns on the Mountain, causing them to blow in an irregular pattern which is often difficult to predict. Wind impacts caused by gorse burning would depend on the location and time of day the burning take place. If the majority of the burning takes place in the Saddle Area, where most of the gorse is found, and the prevailing winds are westerly, the pollutants emitted by the burn will most likely blow toward the Industrial Park. As stated previously, the winds are generally light in the morning and become stronger in the afternoon (County Park EIR). If the burning is accomplished during a time of day when the winds are light, such as in the morning, the impacts on adjoining communities may be decreased.

At present, approximately 450 acres are proposed for grading in the development areas. Again, using the AP 42 factor of 1.2 tons/acre/month for heavy construction it is estimated that 0.2 tons of particulate emissions (dust and fumes) will be created each day if 4 acres are graded. Thus, it is estimated that over a five month period, if four acres are graded each day, a total of 24 tons of particulate will be emitted. Because specific development grading is not know at this time, the annual impact on air quality is not calcuable. The estimate of 24 tons is based on the worst case, that is if all acres now proposed for grading are actually graded within five months. However, the HCP specifies that no more than one grading phase can be completed in a given year, therefore, the annual amount of emissions will be significantly less than 24 tons.

TABLE III - 8
PREDICTED EMISSION - GORSE BURNING AND GRASSLAND WILDFIRE

Total Particulate	
Gorse	
4 acres/year	1224 lb/year
12 acres/year	3672 lb/year
Grassland	
400 acres/year	14,960 lb/year
900 acres/year	33,660 lb/year
Carbon Monoxide	
Gorse	
4 acres/year	10,080 lb/year
12 acres/year	30,240 lb/year
Grassland	
400 acres/year	123,200 lb/year
900 acres/year	277,200 lb/year
Hydrocarbons	
Gorse	
4 acres/year	1728 lb/year
12 acres/year	5184 lb/year
Grassland	
400 acres/year	21,120 lb/year
900 acres/year	47,520 lb/year
Nitrogen oxide	
Gorse	
4 acres/year	288 lb/year
12 acres/year	864 lb/year
Grassland	
400 acres/year	3520 lb/year
900 acres/year	7920 lb/year

Pollutant yields estimated by fuel loading x AP 42 factor. Fuel loading for gorse used is 18 ton/acre and for grassland 2.2ton/acre, as estimated in A Fire Hazard Severity Classification System for California's Wildland (County Park EIR 1976).

E. ENERGY AND WATER USE

The habitat enhancement techniques and development related grading, which are the primary results of the Habitat Conservation Plan, will have an insignificant impact on energy and water use in the San Bruno Mountain area because the annual areas to be covered by these activities are small (1-33 acres). The habitat enhancement activities will require a similar amount of energy and water as is consumed by the annual operation of the San Bruno Mountain County Park.

Primary HCP Activities which will require energy and water include:

- o Monitoring activities
  - automobile
- o Thinning exotics (Eucalyptus)
  - tree removal equipment
- o Vandalism/fire control
  - patrol vehicles
- o Chaining, scraping/raking, grading
  - operation of heavy equipment
  - water truck for dust control
- o Burning
  - heavy equipment
- o Revegetation (seeding/propagation)
  - machinery, eg. a hydromulcher
  - watering equipment

Development of the parcels subsequent to the issuance of the 10(a) Permit will cause increases in energy use for construction, operation and maintenance of the development areas. These will affect local community services and utilities in the form of increased uses of electricity, natural gas, water and water treatment facilities, and waste and waste treatment facilities. In addition, the presence of the developments will increase automobile use in the area. Combined these may have a significant impact on local and regional energy and water use; this is discussed in Chapter IV and will be addressed in the individual project EIRs.

F. AESTHETICS

1. General Visual Setting

San Bruno Mountain is visible from several bay area cities; its height in relation to the surrounding low lying areas accentuates its appearance (see Figure III-8). The Mountain's visual quality varies depending on the season or the viewshed. The eastern portion of the Mountain is predominantly grassland, while the western portion is largely made up of brush species and eucalyptus trees. In the winter and spring months the newly sprouting annual grasses give the mountain a fresh, green appearance. In the early spring these grasses are mixed with the colorful display of native wildflowers which are not noticable from a distance. In the late spring, summer, and early fall months, when the grasses have dried out, the eastern portion of the mountain takes on a dry desolate look. The Mountain's western portion, does not change as abruptly but does appear greener in the spring when the wildflowers are in bloom and the brush has taken on new growth.

2. Impacts

The limited development described in the Habitat Conservation Plan will have the greatest impact on the Mountain's general visual setting. The lower elevations of the south slope and southeast ridge areas, the bowl areas and lower ridges of the Northeast ridge, the upper elevations of Reservoir Hill, and the slopes northeast of Guadalupe Canyon Parkway (north of the Northeast ridge) will become residential neighborhoods. These neighorhoods will be most visible on a local scale rather than a regional. For specific viewsheds and discussions of visual impacts for individual projects, see their specific project EIRs.

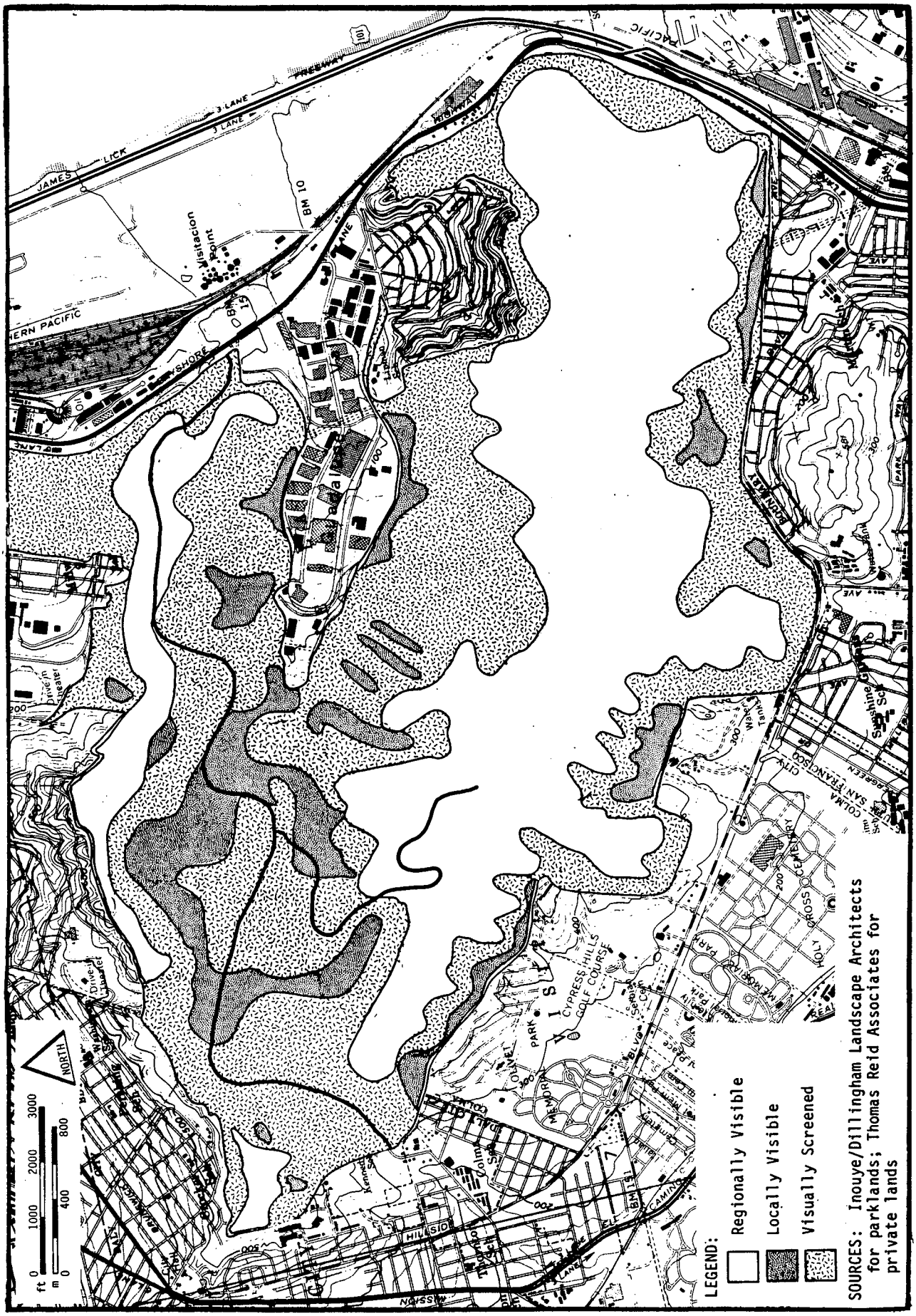
There are several enhancement techniques proposed to increase the quality of presently unusable habitat for the species of concern. These range from seeding native host plants and eliminating exotic species and encroaching brush, to modifying soil conditions or topography in order to create preferred habitat types. Initially, some of these activities will have localized visual impacts on small areas as they are annually treated. In the long term, there may be subtle changes to the general visual quality of the Mountain as areas treated increase. However, because these changes will be gradual they will not have a overall significant visual impact.

The Saddle and Guadalupe Hills planning areas are subject to the majority of enhancement activities due to the large numbers of exotic species found there. Therefore, the most noticable visual changes will occur in these two areas. At present, the Radio Ridge and Southeast ridge planning areas require very little enhancement, thus visual changes related to these will be minimal. The visual impacts for specific enhancement techniques are discussed below.

a. Revegetation

Revegetation involves either seeding or propagating native and host plant species in areas which will be temporarily disturbed by development, where brush or exotic species management has taken place, or in areas currently void of plants (i.e. cut slopes along Guadalupe Canyon Parkway). Revegetation

FIGURE III - 8
SAN BRUNO MOUNTAIN VISIBILITY



activities will have a positive visual impact due to the increased numbers of native plants which will become visible.

b. Brush and Exotic Species Management

Generally, activities associated with brush and exotic species management will have minor short-term aesthetic impacts. These will be primarily caused by the temporary disturbance of eliminating the existing species. In addition, depending on the objectives of the observer, other minor impacts may be caused by the transition from one plant community to another. For instance, gorse areas in the Saddle will be gradually removed and the area will be converted back to its original grassland community. Gorse is a thorny European shrub which produces an abundant display of yellow pea like flowers all year around. These displays are visually pleasing to persons viewing the site from a distance. Replacing these will be grasses and native wildflowers which may not be as aesthetically pleasing all year around.

Chaining, Scraping/Raking - These activities will have temporary negative visual impacts on 4 to 12 acres of annual grassland, brush, or areas of exotic species per year. Local viewers will see temporary scars left after areas are chained, scraped, or raked. These scars will be eliminated within a few weeks as seeded natives become established, therefore, the year to year impact will cover an area of less than 12 acres.

Burning - The visual impacts associated with burning are similar as for chaining, scraping, or raking. In areas where controlled burns are used to eliminate exotics, the burns will leave the area charred until seeded natives begin to grow. In some areas, where arson fires are allowed to burn there will be large visible scars left. These will be eliminated after the winter rains come and the new grasses and native plants resprout. At the present, many acres of annual grasses burn on the Mountain every year and most people are familiar with the burn scars. Therefore, the HCP will not significantly change the overall visual setting associated with burning.

Herbicide Applications - Herbicides will be applied on an individual basis to the seedlings of exotic species which resprout after areas are chained, scraped, raked, or burned. There should be no noticable visual impacts caused by this activity since the seedlings removed will be mixed in with sprouting natives.

Reintroduction of grazing - this grassland successional management technique would cause the establishment of either cattle, sheep, or goats on some portions of the Mountain. These would be locally visible by nearby residents, park users, and persons traveling on nearby roads. Since the visual interpretation of such animals varies with the viewer, it difficult to determine the impact, however it is likely it would not be negative.

c. Landscape and Soil Modifications

Both landscape and soil modification techniques are theoretical and, initially, would only be implemented on a experimental basis of less than one acre. If successful additional areas may be treated. Soil modification involves spreading rock on bare areas before seeding takes place. Visually, there would be not significant change to the treated area until the plants become established at which time the visual quality will increase.

Landscape modification is much more complicated, involving the possible movement of earth in order to create knolls or other unique topographical features. Again this would only be done in areas where no or little vegetation exists, so that the ultimate result would be an increased visual quality when the process of revegetation is complete.

G. CULTURAL RESOURCES

1. Archaeological Resources

Three aboriginal sites are known on San Bruno Mountain. All are marked by shell mounds. It is likely the shell midden sites found on the Mountain are relects from the Costanoan dialect group, since they were known to have occupied the San Francisco Bay, Sacramento, Point Sur areas. Activities of this tribe included hunting, fishing and gathering and trading with other nearby Native American tribes. During the Mission period, which lasted from about 1770 to 1835, the Costanoan worked for the Missionaries and ultimately left the Mountain area (condensed from Co. Park G. P., May 1982).

A shell midden site was recorded in Buckeye Canyon by Holman (1974). This site is 300 by 200 feet in area, and showed no signs of disturbance in 1974. Development is proposed in the lower sections of Buckeye Canyon only, below the knoll where this site is located.

Holman also resurveyed a large shell mound near Old Bayshore Highway, south of Sierra Point, but did not find a previously recorded, nearly flat shell mound supposedly 250 yards north of the large shell mound, up against Sierra Pt. Both the large shell mound visited by Holman (1974) and the nearby shell mound not seen by Holman, are in the South Slope development area, just outside the boundaries of the County Park. In April 1982, an archaeologist, R. Cartier, did a field reconaissance for the South Slope project EIR. During this time three shell mounds were rediscovered. One mound was found in a very disturbed condition. It is likely the disturbance was caused by underground utility trenching. The other mound found is in good condition and is thought to be quite valuable. The third site was located outside the proposed developmet area (Bill Rozar, pers. comm. June 1982). The South Slope EIR includes the archeological analysis and mitigation measures to protect the mound.

Three areas were described by Holman (1974) which could contain archaeological resources. All three were considered likely locations for past human use, and all were unable to be thoroughly surveyed due to dense vegetation or soggy conditions during the time of the survey.

In the Saddle area, north of the old road, is a 5 to 10 acre freshwater bog which was a possible site. This area is in the County Park, outside of any of the proposed development areas, and is adjacent to the proposed County Park interpretation center.

On the southern part of the proposed Northeast Ridge development are potential archaeological sites in the two small canyons which empty into Guadalupe Valley (Wilson and Deitz, 1974). One potential site is at the bottom of the eastern-most canyon, where a large amount of garbage has been dumped just north of the railroad tracks. The other potential site is a small canyon to the west which turns into a bog directly above the railroad tracks. Both of these locations are in the proposed Northeast Ridge development which would proceed if the section 10(a) permit is granted.

Potential shell midden sites in Serbian, Pig Ranch, and Poison Oak

Ravines were investigated by Wilson and Deitz (1974), and were determined to not be significant, because the oyster shells found in the ravines were of a non-native variety, and therfore could not have been left behind by earlier Native Americans.

If any unknown or suspected archaeological site are discovered during any phase of HCP implementation, a registered archaeologist should be consulted. If feasible, the site should be left undisturbed or if impacts are forseen, these should be mitigated. In areas where development is proposed, the specific project EIR should address archaeological resources.

2. Historical Resources

The first Europeans saw San Bruno Mountain in 1769; these were members of the Portola Expedition. The Mountain was named for Saint Bruno, the patron saint of Bruno Hecata. In 1776 the Mountain became a Rancho. It then went through several ownerships, the most prominant of these was Jacob P. Leese who owned most of Rancho Canada de Guadalupe, la Visitacion y Rodeo Viejo. In 1872 Visitacion Land Company became the next prominant owner, and in 1884 Crocker Land Company aquired the majority of the Mountain (condensed from McKlintock, Knight and Fahy, 1968).

It is likely that once occupied by the Spanish, cattle grazing took place almost continously on the Mountain. During Crockers occupation of the Mt., a dairy farm was located in what is known today as the Crocker Industrial Park. During this time, grazing was the main activity taking place on the Mt. This ended in the 1960's when the area was developed for light industrial and commercial uses.

Grazing of the Mountain kept brush from taking over the grassland habitat and through this had a beneficial impact on the butterflies of concern. A negative aspect of grazing, however, was the introduction and spread of European annual grasses. These grasses are very dominant on the Mountain today. Adoption of the HCP may result in an eventual reduction in the amount of non-native vegetation which was originally introduced by early cattle grazing.

Several possibly historical sites are located within the County Park boundaries. These include an abandoned Nike base at the top of Radio Ridge, World War II bunkers, and a lone Chinese gravestone which may have been removed to its present location by vandals (Del Davis Assoc. 1976 p. 113). Today the Nike Base is owned by San Mateo County, and is used as Park office and maintenance headquarters. The HCP habitat manager will probably share the office headquarters with the Parks Department. The concrete slab remnants of The WWII bunkers are located in the Saddle area. The HCP would have no impact on the bunkers.

3. Paleontology

Fossils are rare in the Cretaceous marine sandstones and shales of SBM. Small lenses of Franciscan chert containing radiolarians are exposed near Telford and Diamond Streets in South San Francisco (McClintock et al, 1968).

H. EDUCATIONAL AND SCIENTIFIC USES

One of the objectives of the Habitat Conservation Plan is to encourage further study of the Mountain. This objective will be achieved in part by research which is needed for plan implementation, and may also be realized if academic institutions take advantage of the opportunity to use the Mountain as a study site. The Plan may also be considered of educational interest in the fields of planning and resource management as its implementation would represent a workable compromise between conservation of natural resources and urban development.

The Habitat Conservation Plan and supporting documents stress San Bruno Mountain's unique ecosystem and the need for continued investigations into the Mountain's ecology. The endangered species found on the Mountain are not the only unusual and interesting subjects available for study; because of increased isolation from other natural open space and the extremities in microclimates found there, several species of plants or animals may be of interest to both the public and academic community. The open space remaining after development will give researchers or private citizens the opportunity to observe, enjoy and study components of this unique ecosystem.

The operation of the HCP depends on a certain amount of continued research in order to assure that the proper activities are being pursued in the correct sequence. Two types of research are intended; the first is **applied** research during plan implementation and the second is **basic** research on other aspects of the Mountain's ecology. For the most part, applied research will be achieved by the habitat manager and has a specific goal of providing information which will guide the implementation of the habitat enhancement techniques. However, scientists or other researchers could do applied research with the permission of the Plan Operator so long as it does not negatively affect the Plan.

Basic research is that conducted by members of the academic community. Although this type of researh will be coordinated with the HCP, it does not have the same goal of insuring plan success. Although no funding is currently available through the HCP for academic research, the academic community is invited to study any aspect of the Mountain's ecology in order to increase the knowledge about the Mountain or about ecology in general; this type of research can benefit the plan by adding to the reservoir of biological information known on the Mountain and thus, increase the understanding of the effects of plan implementation.

There are several reasons why pursuing the educational and scientific opportunities on San Bruno Mountain may be considered important. The open space will be available as a resource for the public to more widely utilize, especially with regard to conscientious development of the state and county park. The initial studies will guide the implementation of the habitat enhancement techniques. Included as a long term benefit is the information which can be culled from the scientific research which occurs there. There are preserves, such as Jasper Ridge in the foothills of the Santa Cruz Mountains, which have operated for decades and have proved to be an invaluable source for short and long term studies of ecology and population biology. One benefit of being able to make long term studies, such as those conducted on Jasper Ridge, is that they help us understand more about the

components of one ecosystem; help us apply that knowledge in a broader sense to other ecosystems; and add to our knowledge of our environment.

Research involved with Plan operation includes determining the most effective methods of propagating the plants important to the rare and endangered butterflies, and gorse and brush control. In addition, monitoring various aspects of Plan implementation such as habitat enhancement, development activities, and butterfly and plant populations, are other specific types of research activities mentioned in the HCP. There are several other possibilities for research on San Bruno Mountain which are not specific to plan implementation, but which would benefit the Plan; a few of these are listed below:

Brush/grassland succession. According to the Plan, "one area of basic research which is integral to the long-term implementation of the Plan is research into the process of natural succession on the Mountain -- in particular the rate at which brushland is replacing grassland and the rate at which butterfly host plants, such as lupines or violets are being outcompeted by other grassland species." This research would entail accurate mapping of the present brush line for historic purposes, including comparing the ages of the center of a stand of brush with "pioneer" plants standing alone in the neighboring grassland, and marking the current outer edge of the brush stand to observe how quickly that line is expanded. The study of historic aerial photos would also better substantiate the historic database. Changes in grassland species composition need systematic study; this can be acheived through field techniques which measure percent cover, such as those described in the Biological Study.

Status of the native grassland. Currently only anecdotal information is available regarding the distribution and status of the native grasses on the Mountain. Since native grasses are the ancestral condition, it may be desirable to encourage the growth of existing native grasses. In order to measure the HCP's success in stabilizing or increasing the amount of native grasses found on the Mountain it may be worthwile to map the native grass community currently present on the Mountain and compare its size with future mappings.

Butterfly/plant population research. This covers a wide range of topics from basic monitoring of population distributions as a necessary part of the Plan, to studying any number of topics which are concerned with insect, plant, or animal biology or ecology. One study undertaken for the biological report concerned butterfly behavior; this was necessary in order to get an idea of what the habitat requirements of the butterflies are. Using the Biological Study as a basis, behavior studies could continue. Specific observations on how the insects react to nearby developments or specific habitat enhancement techniques could be very useful to the Plan Operator.

Other wildlife. San Bruno Mountain is habitat for many species of insects, birds, mammals, rodents, and amphibians. Student researchers could do applied population, behavioral or other studies on these in conjunction with academic work at nearby universities. In addition, there are other "species of concern" which exist or are thought to exist on the Mountain such as the endangered San Francisco Garter snake, the endangered San Bruno Elfin, the tree lupine moth, and the solitary bee. There is probably an unlimited number of study topics which could be pursued with regard to other wildlife on SBM.

Fire studies. Fires will continue to occur on the Mountain. At present, much more information can be gained about the effects of fire on the grassland and brush ecology of the Mountain; any number of studies regarding the effects of "naturally" occuring fires are possible. Such studies could utilize a historical database for comparison of results.

There are undoubtedly other subjects which could be covered in the study of San Bruno Mountain. All of these studies have in their favor a historical database which has been built up over the years by amateur and professional scientists. Recently, contributors to this database include McClintock, Knight and Fahy (on native plants), R.A. Arnold (on rare and endangered butterfly species), and the San Bruno Mountain Endangered Species Biological Study of 1980-1981 (on the overall ecology of the Mountain, especially as it related to the Mission Blue and Callippe Silverspot buterflies). The historic information which exists has value as a database upon which to make comparisons and thereby measure changes which occur in the Mountain's ecology.

Easily, the HCP could become a type of clearing house for research projects conducted on the Mountain. Such a clearing house should be set up so that various researchers could proceed most efficiently and so published results are widely available. Research could be coordinated so that researchers are aware of other ongoing, past and possibly planned projects. In this way projects can compliment each other.

The only adverse impact arising from educational/scientific uses on the Mountain would be an increase in the number of people out on the Mountain. Organization of research projects and limited access could mitigate such an impact. Overall benefits of the Plan are that it invites students of ecology, resource management and planning to take an interest in the Mountain, invites more educational and recreational opportunities, and through various studies can provide information which may further educate the public.

IV. INDIRECT IMPACTS OF ASSOCIATED DEVELOPMENT

Adoption of the HCP by San Mateo County and issuance of the Section 10(a) permit by the U. S. Fish and Wildlife Service will allow a limited amount of development to take place on the Mountain. Each project will have direct impacts, but these impacts are not directly related to the Habitat Conservation Plan activities, and they are considered here only as secondary impacts of the Plan. Each development will have to go though an environmental impact process separate from that done for the HCP. Some projects have have already begun the process, others have completed it, while still others have not started.

The following is a list of each project, and a brief description of its impacts as determined by an environmental impact document, or if not available, another document. Following that is an overall assessment of the cumulative impacts of all of the proposed projects.

A. DIRECT IMPACTS OF INDIVIDUAL PROJECTS

RIO VERDE ESTATES - From Draft Environmental Report, Aug. 10, 1981

Project: 524 dwelling units; almost all in two & three story apt. style buldings (the largest building will contain 72 units).

Plans, Ordinances, Policies: Designed as a "Special Area" with site specific planning for development by Daly City General Plan. Adjacent to Carter-Martin Street Extension, Rio Verde Heights projects. San Bruno Mountain General Plan Amendment (SBM GPA): apparently no impact. In Brisbane's sphere of influence according to the Local Agency Formation Commission (LAFCO). No significant impact on plans, ordinances, and policies.

Biology: Habitat for Mission Blue found on site - long term effect minimal (according to EIR). Small impact on Callippe. EIR considers a significant impact on biology.

Socioeconomics: Sixty seven percent increase in the neighborhood population (w/524 units)

Geology, Soils, Hydrology: Development may interupt natural patterns of surface drainage and create problems; not serious if handled correctly with drainage ditches. No significant impact.

Air Quality: Not found to be significant enough to study.

Energy Use: Sanitation District conducting study (1981) of updating sewage system to determine affects on the SF sewer system. Will cause changes/improvements in local utility systems. Effects not found to be significant enough to study in detail. Gas & Electric/telephone would have to be extended to the site. Water service will have to be installed.

Aesthetics: Portions on steeper slopes will be most visible to existing residents of Bayshore Neighborhood.

Cultural Resources: Effects not found to be significant.

INDIRECT IMPACTS OF ASSOCIATED DEVELOPMENT

Growth Inducement: Parcels to the north and west may develop; project will not determine their future use. No stimulation of development beyond Daly City limits to the south due to topographical limitations. Will change/ improve local utility systems.

Noise: Effects not found to be significant enough to study in detail.

Traffic: Project will create more than 3,850 vehicle trips/day. No neighborhood streets will exceed capacity although there will be a significant increase in traffic along them. Bus service would probably be extended into the area.

Land Use: Currently open space; zoned multiple family residential.

Community Services: Fire Department will have to be expanded. Demand for recreation facilities will increase; they are already in short supply. Effects not found to be signficant.

CARTER MARTIN ROAD EXTENSION - From Draft EIR, March 1982

Project: Widening to four lanes and extending Carter Street from Geneva Blvd. to Guadalupe Canyon Parkway (GCP) on San Bruno Mountain; improving Martin to 2 lanes from Carter to just past Rio Verde Sts.; building new 3 lane, exit only, from Cow Palace to existing Carter st. Maximum grade 15%; 10 foot pedestrian footway on east Carter extension. Signals at Carter & Geneva, Carter & Cow Palace exit, Carter & GCP; new intersection at GCP with free right turn lane; Carter-Geneva intersection upgraded to allow for free right hand to & from Geneva.

Plans, Ordinances, Policies: Daly City General Plan calls for secondary access to Cow Palace adjacent to Rio Verde Estates/Heights proposals. Cow Palace Land Use Plan: project is consistent with implementation of it. LAFCO sphere of influence 1980: project could be possibly be annexed to Brisbane where it is in the Bayshore Neighborhood & unincorporated areas. Daly City has jurisdiction over the project. In addition, the City and County of San Francisco will require extra territorial jurisdiction for improvements at Geneva.

Biology: Mission Blue Habitat; will block corridor between Guadalupe Hills and Saddle.

Socioeconomics: Cost will be borne by an Assessment District composed of benefitting property owners. Income base of neighborhood will become diverse (because of cost of construction). Project cannot proceed without assessment district.

Geology, Soils, Hydrology: Cut and fill for roadway will have an effect on runoff and topography but can be substantially mitigated by proper construction. No changes in water courses, flooding, rate of flow or direction of ground waters.

Air Quality: Initial study indicated this was not an issue of concern. However, there may be some impact to air quality from activities associated

with development (i.e. grading, incremental traffic).

Energy Use: Assuming project will cause development, there will be concurrent increases in energy use connected to development. Initial study found this not to be an issue of concern.

Aesthetics: No information

Cultural Resources: Initial study eliminated this issue.

Growth Inducement: Will "provide access to a hillside which otherwise might not develop for a number of years"

Noise: Initial study found no significant impact.

Traffic: Intersection at GCP potentially hazardous- EIR recomends changing design. Some increase of traffic on Geneva, GCP, Bayshore Blvd, but no effect on level of operations at peak hours. Extension of bus service will cause 6% increase on GCP, 19% increase on Bayshore Blvd north of Geneva; this is assuming Rio Verde and Northeast Ridge developments go through. Will provide relief of present Cow Palace exit problem.

Land Use: Land use currently mixed: commercial, agricultural, industrial, and open space. San Francisco zones include C-2 (commercial, residential 1 unit/800 square feet, RH-2 (duplex: 1 unit/1500 sq. ft.), RH-1 (single family res. 1 unit/3000 sq. ft.). Daly City zones: C-2 (Heavy Commrcial), R-3 (multiple family one unit/500 sq. ft.), M-2 along GCP (light; heavy industrial & manufacturing).

Community Service: Initial study found this not to be an issue of concern.

RIO VERDE HEIGHTS - From Draft EIR, August 10, 1981

Project: 160 condominiums. Access would be gained from extensions of Schwerwin, Oriente, Rio Verde Sts. and the proposed Carter Martin extension.

Plans, Ordinances, Policies: General Plan shows three different land use designations for the area: open space on east end, residential at Schwerwin Street, and special area (site specific development) for remainder. Development plans have been revised (drop of 48 units) so that no development will occur in open space designated area. Adjacent proposals include Carter Martin St. extension & Rio Verde Estates project. Development is not dependent on C-M extension. Under Daly City's jurisdiction but can annex to Brisbane; unincorporated areas will go to Brisbane if incorporated. May have to alter LAFCO sphere of influence assignment in order to get water.

Biology: 90% of site will be disturbed. Currenty grassland habitat for Mission Blue & Callippe Silverspot butterflies.

Socioeconomics: Project will increase neighborhood population by 21%.

Geology, Soils, Hydrology: Hillside is dotted with landslides, fills, and natural seeps which can be reduced to acceptable levels by engineering but

won't be eliminated. Some additional runoff could affect Robertson School & Martin St. stormdrain. New drainage system may require modification to canal now transporting water to the bay.

Air Quality: Initial study determined this did not require investigation.

Energy Use: Initial study determined this did not require investigation.

Aesthetics: Highly visible from north side, not visible from GCP. Visible effects will be longterm.

Cultural Resources: Initial study determined this not to be an issue of concern for EIR.

Growth Inducement: Will reduce growth to west (Rio Verde Estates); modification/improvement of utilities will also facilitate growth to west. No growth induced past southern boundary of Daly City. Could stimulate construction of Carter-Martin St. extension.

Noise: Residents will be subjected to noise from transmission lines which could also interfere with tv/radio transmission.

Traffic: Project will create 1,300 vehicle trips per day. Streets can accommodate extra volume but increase will be noticable to existing residents. High percentage increase on Scherwin and Rio Verde Streets. Existing and proposed grades on Rio Verde and Scherwin Streets are near the upper limit of those negotiable by large vehicles (i.e. fire trucks, buses). Some curves may be unsafe.

Land Use: Currently zoned R-1 (2500-3000 square foot max./housing unit); nursery schools, utilities, and public services are conditional uses. Also zoned R-3, multiple family residential (max. density 1 unit/500 square foot); conditional uses include motels, offices, and resthomes. Existing use is pasture for horses.

Community Services: School enrollment will not exceed existing capacity. There will be an increased demands on already limited recreational facilities. Capacity problem in existing sewer system and potential problem with velocity of flow from hillside. This needs further study. Water system will have to be constructed; potential problems of increased pressure in older neighboring systems. No significant impact on garbage disposal service. Project in conjunction with others will require expansion of fire department.

BRISBANE SCHOOL SITE - From Draft EIR on Annexation and Prezoning, Nov. 1981

Project: Proposed annexation and pre-zoning to a planned unit development within Daly City. Draft EIR on pre-zoning assumes 210 units will be built on the site.

Plans, Ordinances, and Policies: Currently zoned by San Mateo County as an agricultural district. In the San Mateo County General Plan site designated as "vacant lands under study". In Daly City's sphere of influence. If developed, could interfere with Daly City's General Plan (DCGP) which designates the area as open space - "visual background". Development could

also conflict with the DCGP by overloading sewage capacity, removing trees which protect groundwater recharge, blocking scenic corridors, and impacting recreational uses. Neighboring projects: Reservoir Hill, Mission Drive In, Crocker School, and Scenic Heights.

Biology: Existing plant and wildlife communities would be significantly altered or altogether eliminated by the project. No Mission Blue or Callippe found on the site, however, project may interfere with movement between the Guadalupe Hills and Reservoir Hill colonies. Existing vegetation primarily tree lupines, brush and trees. Known site of tree lupine moth, a species of concern.

Socioeconomics: Pre-zoning to development district would allow diversity of housing types introduced into the neighborhood; estimated population 687 residents. Estimated cost per dwelling unit $140,000 for single family, and $100,000 for townhomes. Property taxes (1% on 6 million) would yield total annual revenues of $243,300 in 1981 dollars; $54,985 to Daly City. Projected slaes tax revenues from the development are $29,820 per year when all homes are occupied. Development would yield $13,398 per year other revenues. Capital costs: city departments and local districts, except fire department, will see little or no need for capital improvements; $92,400 for new fire fighting facilities would be cost attributed to this site (in conjunction with neighboring sites). Annual operating cost: $66,823 for a net annual revenue of $33,010 (in 1981 dollars) to Daly City.

Geology, Soils, and Hydrology: No information

Air Quality: No information

Energy Use: If 120 new single family homes are built, energy demand would be 354,822 kilowatt hours per year, and 67,782 therms per year. Ninety new multi-family units would require approximately 225,176 kw hours per yearr, and 43,016 therms per year. Total energy requirements would be 579,998 kw hours per year, and 110,798 therms per year. This is assuming conservation measures are used. Gasoline use wuld be significant because topography discourages bicycling and walking. Buses do not currently service this site.

Aesthetics: Changing "visual background" area to one with structures. Grading will alter original topography, large trees may be lost. Highly visible from the north and northwest from higher north facing slopes on San Bruno Mountain.

Cultural Resources: No information

Growth Inducment: No information

Noise: No information

Traffic: If developed to 210 units, 1,700 daily trips would be generated. This would downgrade the service level as the Mission St./Crocker intersection. Transportation to site is adequate as long as improvements intended for Crocker Ave. are implemented.

Land Use: Currently zoned as agricultural in San Mateo County General Plan. No significant impact on surrounding land use.

Community Services: If developed there will be an increased demand for fire protection. There are existing inadequacies of the San Francisco sewer system, these would be made worse. Relocation of underground water and phone lines may be required. Water supplies should be adequate for the project, although pumping may be necessary.

BRISBANE QUARRY - From Draft EIR, 1975 and Quarry Reclamation Plan, 1981

Project: Continued operation of quarry. The major impacts of the Quarry took place almost 90 years ago, when quarry operation began.

Plans, Ordinances, and Policies: Currently in compliance with zoning ordinances and general Plans.

Biology: Because the quarry has agreed in the Reclamation Plan to confine its operations to existing excavation borders, future quarrying will have no impact on biology.

Socioeconomics: No significant increases in production planned. Future operation will not change existing quarry related demographic and socioeconomic conditions. Continued operation represents continued availability of low cost rock.

Geology, Soils, and Hydrology: If recommended slope angles are not exceeded, no stability problems are likely. May be temporary increased soil erosion caused by by excavation. Soil loss from access roads and processing area is the major continuing source of sediment. Water quality will be impacted if erosion increases, otherwise, the quarry's effect on hydrology will not be significantly altered if operation continues.

Air Quality: The quarry is currently in compliance with Bay Area Air Quality Management District regulations.

Energy Use: Continued operation would enable the quarry to reduce the amount of water purchased from Guadalupe Valley Municipal Improvement District due to improvements in recycling water. Wastewater generation and gas consumption would remain at existing levels. Operation is interruptable if there is a gas shortage. Electricity, telephone, and solid waste service levels will remain at current levels.

Aesthetics: No change until revegetation of finished slopes takes place.

Cultural Resources: No information

Growth Inducement: In June 1982, the San Mateo County Planning Commission limited the quarrying activities to a 10-year period and designated future use as light industrial.

Noise: No significant impact anticipated if quidelines are followed.

Traffic: Currently between 100 and 200 truck vehicle trips daily generated by the quarry.

Land Use: Zoned heavy industrial. This is generally compatible with existing surrounding land uses. Northeast Ridge development may cause conflict with respect to visual elements. Also potential conflict with County Park users.

Community Services: Requirements for police, fire, and hospital services are expected to remain the same.

RESERVOIR HILL - From Final EIR, Nov. 24, 1980

Project: Project consists of 326 condominimums in 17 10-plex clusters, 39 4-plex clusters and 10 single family lots on a 108 acre site.

Plans, Ordinances, and Policies: In the Daly City General Plan (DCGP) the site is designated as a special area. The DCGP recommends a residential development of 600 units. Portion of the site is unincorporated, this has to be annexed to Daly City. Project is inconsistent with the County General Plan, but consistent with its general intent. Annexation of the project is consistent with LAFCO's sphere of influence, but annexation of Guadalupe Canyon Parkway would require an amendment.

Biology: 98% of the existing Mission Blue colony on Reservoir Hill would be lost by the development. There would be permanent elimination of 13% of the existing natural vegetation on the site.

Socioeconomics: Project would accomodate approximately 615 new residents. Estimated sale price of units is $85,000-125,000 for the condominiums, and $200,000 for the single family houses. Net gain in revenues for Daly City estimated at $362,300 in property taxes, and 11,660 in sales taxes.

Geology, Soils, and Hydrology: May be problems associated with constuction of roadways on steep slopes. Sandy soils are susceptable to erosion.

Air Quality: Increased vehicular traffic may have a significant impact on regional air quality.

Energy Use: Gas and electricity area capacity has been increased, so that project will not cause brown outs. Energy efficient features to be incorporated into the project design. Old sewer mains will have to be replaced.

Aesthetics: The buildings will follow the slope of the hill so that graading is minimized. Project will be highly visible from portions of Daly City and the San Bruno Mountain County Park. View will be altered from natural open space to manmade environment.

Cultural Resources: No known cultural or archaeological resources found on the project site.

Growth Inducement: Project is not likely to encourage additional residential development in Daly City. Not of sufficient size to bring in revenues which would induce growth. Would not require expansion of services

beyond those already planned.

Noise: Construction noise adverse, but short term. No other significant noise impacts.

Traffic: Estimated to generate a total os 2,430 vehicle trips daily. These would be distributed evenly between Crocker Avenue and Thiers/Florence Avenues. Intersection capacity not significantly effected. Will have significant adverse impact on neighborhoods at eastern end of Thiers Ave. and southern end of Crocker Ave., unless alternative of providing access to Guadaupe Canyon Parkway is pursued. May be a significant impact on traffic safety.

Land Use: Currently zoned for planned unit development.

Community Services: Schools will not be significantly impacted. Existing fire protection is sufficient, however may be service problems due to building configurations. One patrolman will have to be added to the police force. Proposed sewer system is consistent with district policy. The anticipated increase in effluent will be adequately serviced.

NORTHEAST RIDGE - From Brisbane General Plan (BGP), Jan. 28, 1980; Crocker Hills General Plan Amendment Draft (CH GPA) EIR, January 1975; and Proposed Development Plan, Northeast Ridge-San Bruno Mountain, January 1982 (draft).

Project: According to the Proposed Development Plan, the development will consist of a planned community development, consisting of 1,250 dwelling units on 230 gross/67 net buildable acres on the Northeast Ridge of San Bruno Mountain. Development will be concentrated in four building sites. Site 1, 15.5 acres, will have 200 dwelling units of 3-story wood frame terraced townhouses/flats; Site 2, 13.5 acres, will have 220 dwelling units of maximum 3-story vertical measurement terraced, wood-frame townhomes/flats; Site 3, 11 acres, will have 140 dwelling units of 3-story wood framed terraced townhomes/flats; and Site 4, 27 acres, will have 690 dwelling units of 3-story wood frame homes over concrete garages. The project is phased; it is expected that sites 1, 3, and 4 will be developed first. Buildout is anticipated in five years, depending on market conditions; at ultimate buildout, the project population will range between 2,800 and 3,250 persons.

Plans, Ordinances, and Policies: The area will be prezoned prior to annexation to Brisbane.

Biology: The Northeast Ridge colonies of the Mission Blue and Callippe comprise the second largest on San Bruno Mountain. Currently 16% of the entire Mission Blue population and 12% of the Callippe population utlize the area. In addition, to butterfly habitat, the site suports other vegetative communities which attract other species of animals and insects. As much as 5.5% of the total Mission Blue and 4.5% of the total Callippe populations are found in the disturbed areas of the parcel and will be destroyed by the development.

Socioeconomics: No information.

Geology, Soils, Hydrology: Project development would increase the

potential for erosion and siltation; without mitigation, significant adverse impacts on drainage basin facilities, especially Brisbane Lagoon, could result. Cut slopes and fill areas need careful design to prevent slope failure in earthquake-prone areas. Construction should be limited to slopes of a steepness of less than 30%. Use of large fragments resulting from excavation of Franciscan bedrock in fill could create differential settlement problems. No significant adverse hydrologic impacts are expected.

Air Quality: According to the Proposed Development Plan for Northeast Ridge, dust generated by construction activity would be the most serious threat to air quality associated with the project.

Energy Use: The water supply for the proposed project would be supplied by the City of Brisbane, who in turn purchases it from the San Francisco Water Department. Any increase in water consumption in the San Francisco Water Department district can be considered an adverse impact. To meet the demands generated by the project, a 750,000 gallon water storage tank will be required. The tank location and plan have been previously designated. There will be no need for main supply extensions outside the project site. With respect to the supply of electricity, no electrical substations would require expansions that would adversely effect local residences or businesses. The Project will not require unusual natural gas usage in the local area. To keep use of energy for heating to a minimum, the project should be designed to optimize building exposure for solar energy and provide protection for wind-exposed areas.

Traffic: Significant adverse impacts resulting from project-generated travel will occur along segments of major traffic corridors serving project areas. An internal circulation network should be established among Central Brisbane, the Industrial Park, and Northeast Ridge.

Land Use: Retail and office commercial uses will interface with Bayshore Boulevard and Guadalupe Canyon Parkway to form a highly visible and accessible 'gateway' to the project area, contrasting with surrounding uses. There is a sensitive relationship between existing and proposed man-made land uses: existing areas of older, single family detatched housing will be next to new multi family/single family attached housing. The density of the residential development should be 0 to 5 dwelling units per acre.

Community Services: Fire and police protection for the project would be provided by the City of Brisbane. No net adverse impact on accessibility or human considerations is expected due to adequate police, fire, and health services are provided in the project plan. The Brisbane School District could be significantly and adversely impacted due to the risk of overloading. Schools are proposed within the project, but there are unresolved issues involving forecasted student loads and financial feasibility. Therefore, the development's impact on the Brisbane School District should be taken into account.

Aesthetics: Portions of the project are visible from many parts of the Peninsula between San Francisco and Brisbane as well as from other locations. In order to retain the visual integrity of the ridgeline, sites should be selected and development designed to fit the natural topography. Large cuts and fills are not desired. Where grading is necessary, it should be contoured to blend with the natural contours of the land. The character of adjoining

cities (especially Brisbane) should be preserved. The development should be integrated with the San Bruno Mountain Regional Park.

Cultural Resources: No archaeological sites or resources have been found on the site. However, if subsurface archaeological remains are encountered during development, construction activities should be halted in the area of the remains until evaluation of the site is completed.

Growth Inducement: No information.

Noise: According to the Proposed Development Plan, no off-site sources of noise, including airline traffic, have been identified as constraints to development. The primary on-site generator of noise will result from project-generated traffic.

BRISBANE ACRES (including Bayside Acres) - From Brisbane General Plan, Jan. 28, 1980

Project: The density of the development should be 0 to 2 residential dwelling units per acre.

Plans, Ordinances, and Policies: No information.

Biology: Attempts should be made during all phases of the development to minimize the distruption of existing plant life. Preservation of vegetation and natural features should be achieved through density transfers. Field surveys should precede any future development in the Acres due to the existence of the Mission Blue and Callippe Silverspot within Brisbane City Limits.

Socioeconomics: No information.

Geology, Soils, Hydrology: Development should not be encouraged on slopes of 40% or greater (71% of the land mass in Brisbane Acres has grades steeper than 30%). Problems of geologic instability associated with landslides and saturated soils indicate that no new development should occur without geotechnical studies adequate to determine the extent of developable area. Grading should be minimized, and mass grading and terracing for construction pads should be discouraged. Grading and construction should be phased to coincide with periods of dry weather.

Air Quality: No information.

Energy Use: No information.

Aesthetics: Any development on the Acres should be considered for its effect on the ridgeline and visually significant slopes and open space. Grading should be minimized and mass grading and terracing for construction pads should be discouraged. All necessary grading should be shaped to conform with natural landforms. Landscaping in the developed area should blend with the natural landscape.

Cultural Resources: No information.

Growth Inducement: No information.

Noise: No information.

Traffic: Development could cause serious circulation problems stemming from narrow, winding, unimproved streets.

Land Use: Recommended densities for the Acres range from one residentail unit per 20,000 squre feet to high density apartments to 1 to 2 dwelling units per acre. A density transfer program should be encouraged to discourage development of the steepest lands.

Community Services: The developers/owners are responsible for providing adequate access and water and sewer services and sufficient water pressure for fire suppresion. Currently, the water pressure to serve Brisbane Acres is substandard, but is sufficient to serve Bayside Acres.

OWL AND BUCKEYE CANYONS - From Schematic Land Use Plan for the Owl and Buckeye Canyons, November 1981.

Project: The total project area is 115 acres. No specific development plans have been prepared for Owl and Buckeye Canyons, but it is likely that if development were to take place, the area would be converted to light industrial use (research and development, industrial office or warehouse facility). If this were to occur, the buildings would probably enclose up to 100,000 square feet at each location; their height would not exceed 35 feet.

Plans, Ordinances and Policies: The project differs with the Brisbane General Plan (BGP) in six notable respects, one of which may be a significant adverse impact: the General Plan calls for open space in Owl and Buckeye Canyons, while a project would propose commercial use.

Biology: Impacts of the development include permanent removal of vegetation, reduction of the mosaic of native/intruduced grassland, and loss of scenic botanical resources and wildlife habitat.

Socioeconomics: No information.

Geology, Soils, Hydrology: Project development would increase the potential for erosion and siltation; without mitigation, significant adverse impacts on drainage basin facilities could result. Cut slopes and fill areas need careful design to prevent slope failure in earthquake-prone areas. Construction should be limited to slopes of a steepness of less than 30%. Use of large fragments resulting from excavation of Franciscan bedrock in fill could create differential settlement problems. No significant adverse hydrologic impacts are expected.

Air Quality: No information.

Energy Use: No information.

Traffic: No information.

Land Use: No information.

Community Services: No net adverse impact on accessibility or human considerations is expected.

Cultural Resources: No information.

Growth Inducement: No information.

Noise: No information.

SOUTH SLOPE - From Crocker Hills General Plan Amendment Draft (CH GPA) EIR, January 1975, and San Mateo County Department of Environmental Management Division of Planning Staff report on the Concept Plan, 1982.

Project: The total project area is 480 acres, with 130 to be developed. Two development areas are proposed. The residential portion of the project consists of approximately 230 acres, 105 of which are proposed for development and the remainder, 125 acres, are to be left as permanent open space. The gross building density is 3.2 dwelling units per acre. The commercial portion of the project consists of approximately 100 acres, 75 of which will be retained as permanent open space. Commercial development will include an 18 story, 400 room hotel, a 268,800 square foot High Technology Trade Center, a 57,500 square foot eight story office condominium, an 18,000 square foot health club, and three restaurants. Two of the restaurants will be located in the Hotel/Seminar Center. The other satellite restaurant will be a 5,000 square foot facility with a 150 seat capacity.

Plans, Ordinances and Policies: The South San Francisco General Plan (SSFGP) calls for an elementary school site which is not provided by the project. The density of the proposed project (3.2 dwelling units per gross acre) is within the density range specified by the SSFGP (0-6 dwelling units pe gross acre). The collector road proposed in the Concept Plan is consistent with the SSFGP. The project plan calls for commercial development along Airport Boulevard which is not provided for in the SSFGP.

Biology: Impacts of the development include permanent removal of vegetation, reduction of the mosaic of native/intruduced grassland, and loss of scenic botanical resources and wildlife habitat.

Socioeconomics: In general, the project will cause an increase in total population size, a redistribution of the regular residental population and business activity, and a minimal change in community socioeconomic status. A fiscal impact study is being prepared to determine the fiscal impact the project will have on the City of South San Francisco.

Geology, Soils, Hydrology: Project development would increase the potential for erosion and siltation; without mitigation, significant adverse impacts on drainage basin facilities could result. Cut slopes and fill areas need careful design to prevent slope failure in earthquake-prone areas. Construction should be limited to slopes of a steepness of less than 30%. Use of large fragments resulting from excavation of Franciscan bedrock in fill could create differential settlement problems. No significant adverse hydrologic impacts are expected.

Air Quality: Oxidant concentrations could be expected to increase by 0.5% downwind. This alone is not significant, but becomes an adverse impact when considered cumulatively oxidants produced by other Bay Area projects. Local air quality impacts due to traffic would be adverse but ambient air quality standards would not be exceeded.

Energy Use: No information

Traffic: Significant adverse impacts resulting from project-generated travel will occur along segments of major traffic corridors serving project areas. The proposal includes construction of the Hillside Boulevard Extension from the current four travel lane section to Bayshore Boulevard. It appears that a four-lane Hillside Boulevard would have sufficient design capacity to carry not only existing traffic but the additional traffic generated by the new project.

Land Use: Retail and office commercial uses will interface with Bayshore Boulevard and Guadalupe Canyon Parkway to form a highly visible and accessible 'gateway' to the project area, contrasting with surrounding uses. There is a sensitive relationship between existing and proposed man-made land uses: existing areas of older, single family detatched housing will be next to new multi family/single family attached housing.

Community Services: No net adverse impact on accessibility or human considerations is expected due to adequate police, fire, and health services are provided in the project plan. The Brisbane School District could be significantly and adversely impacted due to the risk of overloading. Schools are proposed within the project, but there are unresolved issues involving forecasted student loads and financial feasibility.

SAN BRUNO MOUNTAIN STATE AND COUNTY PARK - From EIR, August 1976 and San Bruno Mountain State and County Park General Plan, May 1982

Project: The project is comprised of lands owned by both San Mateo County and the State of California. The State owns 297.6 acres of gently rolling saddle area, north of the summit ridge of the mountain. The County owns 1766 acres of steeply sloping land, including areas along both sides of the summit ridge and the headwaters of Colma and Guadalupe Creeks. Although under two separate ownerships, the Park is operated by San Mateo County and is treated as one park.

Plans, Ordinances, Policies: Many of the General and Regional Plans of surrounding cities (Brisbane, Daly City, South San Francisco and San Francisco) and governing bodies (ABAG) include some sort of recommendation that large portions of San Bruno Mountain be developed as a regional park. The Mountain has been integrated as part of San Mateo County's County Park System.

Biology: San Bruno Mountain's botanical conditions are of significant and interpretive interest. Extensive disturbance by the introduction of human activity could result in the disappearance of these conditions. The most significant natural features are rare and endangered plant and insect species. The impacts of humans and development upon these species and their habitat should be minimized; route trails and circulation should be designed to

minimize intrusion. These species should be monitored to detect changes in their numbers which could result from park development. Exotic species should be controlled and replaced with appropriate native species where possible. Domestic/feral animals from nearby housing developments should be controlled.

Socioeconomic: The Park is tax-exempt, and therefore revenue to schools and other special taxing districts will decrease from the loss of assessments on those parcels incorporated into the park. The amount of revenue lost is not expected to be significant. Development of the park will result in both long and short term employment both in the development of park facilities and in management and administration of the completed park. In addition, it is expected that land values of lots nearby the park will increase as a result of its development.

Geology, Soils, Hydrology: Major bedrock failure is not expected. Risk to life from geologic instability, earthquake induced or otherwise, is low assuming sound engineering practices are followed. Erosion could be a problem near picnic and other visitor facilities where construction and visitor traffic could damage vegetation. Bare, loose, sandy soils should be protected from indiscriminate traffic. Revegetation with native species should be done wherever possible, and netting or hydromulching should be undertaken if necessary. The Park also contains a bog, which should be protected from uncontrolled circulation.

Overall, the project would have beneficial impacts on hydrological connditions by preventing increased silt and storm drainage volumes as well as increased groundwater recharge. Adverse impacts would arise from construction and use of visitor facilities. Erosion during construction and increased runoff from impervious surfaces such as parking lots would cause increased sedimentation in streams. Small retention ponds should be constructed to trap sediments before downstream discharge. To further reduce erosion and stream sedimentation, access roads should be selected that minimize disturbance and grading, and all construction should take place during dry weather. Hiking trails should be graded so as to reduce erosion.

Air Quality: Auto traffic is expected to increase as a result of the project, but its impact on air quality is expected to be minimal.

Energy Use: The Park's development will utilize energy both in the construction of visitor facilities and upon completion of the facilities. The largest energy requirement after completion of the visitor facilities will most likely be electricity for lighting. The amount of this usage is expected to be minor. It is possible that wind-driven generators could be used to generate some of the electricity needed for lighting.

Aesthetics: Preservation of the Park as permanent open space will have a significant positive impact on the aesthetic qualities of the Mountain itself and surrounding areas. Although there will be some modifications of land forms (for the visitor center, etc.) no significant alterations will be made.

Cultural Resources: One prehistoric Native American habitation site exists in the County Park area. At present, no adverse cultural or archaeological impacts are expected.

Growth Inducement: No significant impact.

Noise: Development of the Park will not significantly affect the surrounding existing acoustic environment. High winds and fog will tend to mask noise generated by park use. Active noise areas have been located so as to minimize noise impact. The increase in traffic generated by the Park is not expected to be significant. A positive impact generated by the Park is a decrease in the amount of off-road vehicle (ORV) traffic and noise.

Traffic: Additional traffic generated by the Park is not expected to add significantly to existing traffic volumes to the extent that road capacities are exceeded. Present peak traffic hours on nearby roads are at commute times; peak hours of Park-generated traffic are not likely to coincide. Shuttle busses would be used during peak usage times (weekends, holidays) to transport visitors to the ridgeline from the turnaround at the Park Center building.

Land Use: The development of the Park will not change the character of the Mountain. Some facilities will be added for visitors, and more people will visit the mountain than at present. Illegal land uses (ORVs, dumping) will most likely decrease due to increased monitoring and surveillance on the mountain.

Community Services: The increased number of visitors caused by the development of the Park, coupled with the increased dispersal of the visitors will likely result in more fires on the Mountain. However, increased visitor and employee activity will likely result in more rapid fire detection and suppression. An increase in the number of fires will likely cause an increase in the appearance of fire-regenerative floral species.

The increase in activity at the Park will cause a decrease in the amount of vandalism and an increase in the number of petty crimes (stolen wallets, etc.). The increase in petty crimes could cause an increased burden on the local police force serving the mountain, but this is not expected to be a major impact.

A water supply will be needed at the Park both during construction and when the park resumes normal operation. The necessary water will most likely be obtained using Daly City's supply; the amount needed is not expected to be significant to Daly City. The summit of the Mountain is 570' above the elevation of Daly City's reservoir. Water will have to be pumped to the ridgeline to service facilities on the summit. Adverse impacts such as visual scars and soil erosion could result from construction of a pipeline. A reservoir would be needed also.

Sewage facilities will also need to be constructed. Because the Park Center is so far away from any existing sanitary lines, septic tank/leaching field systems are planned for the five restrooms in the Park Center area. Impacts from the septic tank/leaching field systems, although minor, include possible deterioration of runoff water quality due to thin soil mantle near septic tank/leaching fields and a possible alteration of botanical conditions surrounding the leaching field due to increased soil moisture. The restrooms at Summit Vista at the end of Radio Road will require a holding tank and pump truck system because the soil is too thin, rocky and unsuitable for leaching fields.

The generation of solid wastes from Park visitors is not expected to be significant. Illegal dumping of solid wastes on the Mountain, a problem in the past, should decrease as a result of increased surveillance of the area.

B. CUMULATIVE IMPACTS OF ALL PROPOSED PROJECTS

Projects: The result of the projects mentioned above will be the construction of 3,021 dwelling units (including multi and single family units, additional office space, commercial, and additional recreational and community facilities. In addition, there will be several road improvements made.

Plans, Ordinances, and Policies: The majority of the projects are consistent with applicable plans, ordinances, and policies.

Biology: See Section III.A. for a discussion of the cumulative impacts on plants and animals.

Socioeconomics: The projects will result in an influx of new residents to the Mountain area. Currently, the Mountain is surrounded by older neighborhoods which provide homes for low and middle income residents. The new developments will be affordable to middle and higher income residents. Because of the differences in income levels and housing types, there will likely be a conflict with respect to socioeconomics.

Geology, Soils, and Hydrology: Each specific project will mitigate site specific problems related to geology, soils, and hydrology.

Air Quality: The cumulative impact of all projects on air quality will be a degradation of both local and regional air quality caused by increased vehicular traffic.

Energy Use: There will be a net increase in the use of fossil fuels and electricity brought about by the development proposed on San Bruno Mountain.

Aesthetics: There will be local visual changes brought about by the indiviual projects. This will consist of alteration from natural open space to a mademade environment.

Cultural Resources: Only one project has an impact on archaeological resources; site specific mitigation will be done for this project.

Growth Inducement: No further growth is expected to result from any of the projects mentioned above.

Noise: No significant impacts are expected, although there will likely be an increase in vehicular noise.

Traffic: There will be a significant increase in the amount of traffic generated in the San Bruno Mountain area. This increase will likely have a major impact on the circulation of major roads in the area. San Mateo County is in the process of having a master traffic study done for the San Bruno Mountain area; this study will include all of the projects included above.

Land Use: The major result all projects will be the transition of

approximately 400 acres of existing open space use to primarily urban uses.

Community Services: Each individual project will have to provide for the additional services required in the EIR.

V. MITIGATING MEASURES (FOR ADVERSE EFFECTS)

The action for which this EA/EIR is being prepared is unusual in that the Habitat Conservation Plan itself is a mitigating measure to the issuance of the Section 10(a) permit. The direct adverse effects caused by the issuance of the permit is the taking of the endangered Mission Blue. Loss of other species of concern including the Callippe Silverspot butterfly is also anticipated. The HCP has thoroughly dealt with the mitigation of the adverse impacts of the development on the species of concern. See Table V-1 for a listing of these. Mitigation measures brought out in this EA/EIR is included in Table V-2. The matrix format of the tables shows the relationship between the project's impacts, specific mitigating measures and the effectiveness and feasibility of each.

TABLE V-1
MITIGATING MEASURES DESCRIBED IN THE PLAN

ENVIRONMENTAL FACTOR/ADVERSE IMPACT	SUGGESTED MITIGATING MEASURE
BIOLOGY	
o Habitat remaining in the development parcel after construction will be subject to future threats	o Require that open space within a development or other parcel, which becomes conserved habitat, must be either dedicated to the Plan Operator, or a habiat easement given. This measure will cause the addition of almost 800 acres to public ownership (2/3 of existing grassland.
o The activities needed to protect the species of concern cannot be guaranteed without a permanent funding source.	o Create a Habitat Conservation Trust Fund. The Fund will provide the long term necessary capital for continued research and monitoring of the species populations, as well as managment of brush and exotic species encroachment, enhancement of currently low quality habitat, and control of illegal uses on the Mountain which, in the past, have proved to be detrimental to the Mountain's ecology.
o Uncontrolled development proposed on the Mountain will maximize the impacts on the species of concern.	o Specify a careful and strict pre-development process which will minimize the impacts on the species of concern.
o Uncontrolled actions by future residents may impact the adjacent conserved habitat.	o Require that future residents comply with a set of restrictions regarding adjacent conserved habitat.
o Changes in the proposed projects described in Volume 2 of the HCP, after the HCP is approved, could cause adverse impacts on the conserved habitat.	o Any modification to the development described in Volume II of the HCP which may effect the conserved habitat, or any future proposed development not identified in the HCP, must go through a very strict approval process (see Chap. I).
o The enhancement activities described in the HCP could inadvertently impact other plants and animals on the Mountain.	o Assess impacts on other plants and animals from the brush removal program or any other habitat enhancement technique before any treatment takes place. This should reduce the chance of inadvertant damage to other species which may warrant preservation.
o Mass grading of development areas will cause large losses of the Mission Blue and Callippe to take place in a short period of time.	o Phase grading of development areas to reduce the number of insects lost in one given year.

EFFECTIVENESS	FEASIBILITY
o Effective. The Plan Operator will have control over all of conserved habitat on the Mountain which will substantially reduce threats to habitat.	o Feasible. Is a condition of the HCP.
o Minimimum funding of $60,000 per year is effective for meeting the basic provisions of the HCP. The maximum funding of $100,000 would be effective in meeting the optimum needs of the HCP.	o Feasible. The minimum amount of funding is a condition of the HCP.
o Can be effective if all conditions are met.	o Feasible. Is a condition of the HCP.
o Effective. Can be enforced by Habitat Manager and Plan Operator.	o Feasible. Is a condition of the HCP.
o Effective.	o Feasible. Is a condition of the HCP.
o Effective in providing site and species specific protection.	o Feasible. Is a condition of the HCP.
o Effective in minimizing population losses and allowing for habitat reclamation to progress and insect population to recover.	o Feasible. Is a condition of the HCP.

TABLE V-2
MITIGATION MEASURES SUGGESTED BY THE EA/EIR

ENVIRONMENTAL FACTOR/ADVERSE IMPACT	SUGGESTED MITIGATION MEASURE
ECONOMICS	
o The funding provided for in the Plan will only meet the basic provisions of the Plan.	o In order to increase the funding level proposed in the Plan, require assessments on land uses other than residential. o Include a provision that unplanned parcels, should they be developed, be required to add to the assessment fund. o Facilitate the Plan to act as a clearing house for outside researchers. The Plan operator can coordinate research activities, and publicize the availablilty of research topics found on the Mountain.
CULTURAL RESOURCES	
o Enhancement activities may impact hidden resources.	o If any cultural resources are found during the implementation of any HCP related activities, cease the activities until the resources are assessed.
GEOLOGY, SOILS, AND HYDROLOGY	
o Enhancement related activities may cause increased erosion.	o Incorporate erosion control measures into any HCP activities which may increase erosion potential.
CLIMATE AND AIR QUALITY	
o Burning activities mentioned for brush and exotic species control may have an impact on local or regional air quality.	o Minimize air quality impacts from controlled burning by proper fuel preparation and limiting the burn to "burn days" as required by the Bay Area Air Quality Management District.

EFFECTIVENESS	FEASIBILITY
o Can be effective in helping to meet the maximum funding scenario.	o Feasible. Could be made a condition of the Final HCP.
o Can be effective in helping to meet the maximum funding scenario.	o Feasible. Could be made a condition of Final HCP.
o Results of such research can benefit the Plan by meeting some of the recommended research provisions.	o Feasible. Requires interest of outside researchers.
o Commonly required by State Historical Preservation Office to reduce risk of impact.	o Feasible. The Habitat manager should be trained at identifying sites of potential cultural resources.
o Relatively effective. Erosion may be difficult to avoid due to soil characteristics and extremely steep terrain.	o Feasible. Can be made a condition of the Final HCP.
o Effective.	o Feasible. Can be made a condition of the Final HCP.

VI. ALTERNATIVES

The actions under consideration are all directed to resolving the current threats to a listed endangered species on San Bruno Mountain (SBM). The preferred course of action is issuance by the US FWS and acceptance by local land use authorities of a Section 10(a) permit under the Endangered Species Act predicated on a Habitat Conservation Plan (HCP). The primary goal of the proposed action is environmental enhancement -- directly for the Mission Blue and indirectly for all of San Bruno Mountain. Because the "project" objective is environmental benefit, it is appropriate to consider the objective sought and the impact on the environment together. In this chapter, the preferred action and several alternate actions are compared on the basis of effectiveness in achieving protection for the endangered species and on the basis of environmental impact.

The prefered course of action entails some risk, a short-term impact to the species of concern, and a net reduction in open space on the Mountain. The public acquisition alternative entails less risk and no short-term impact; as such it is the environmentally superior alternative in a local context. The cost of acquisition may be prohibitive or may adversely affect other conservation programs elsewhere.

A. NO PROJECT / NO ACTION -- DELAY

The No Action alternative means that the US FWS, San Mateo County, and the local jurisdictions take no action either to limit the current threat to the endangered species or to resolve the current conflict over use of the private land on SBM. This would effectively leave the habitat and land planning status as they were before the County began the HCP process. This alternative represents any course of action leading to indeterminate delay.

Without the land plans incorporated in the HCP, nearly half of the Mission Blue habitat on SBM would remain in private ownership. The use of the land would be legally governed by the 1976 County General Plan and by general plans in the Cities of Brisbane and Daly City; none of the habitat addressed by the HCP is now in South San Francisco. All of the development projects considered in the HCP are permitted by the current general plans. In addition, several large parcels which would be put into public ownership by the HCP would remain in private ownership pending development plans.

On the other hand, the Mission Blue would remain a listed endangered species and be subject to the protection of the Endangered Species Act. In its present form, the Act prohibits taking of individuals of an endangered subspecies of invertebrates. Little of the locally approved development could occur without a nominal violation of the Act.

No Action would leave the Mission Blue still endangered by development and still protected by the Act. The Act authorizes funds for acquisition of private land for endangered species protection. This alternative is discussed below, however, the acquisition alternative has limitations and until completed there would remain a conflict between the Act and legally approved local land use plans.

The potential for the Act to interfere with ongoing development is significant enough that both developer and local land use authorities would probably seek judicial review rather than simply start construction and wait for the US FWS to intervene. Thus, regardless of the outcome of judicial review, the No Action alternative would probably result in a delay of several years.

The outcome of judicial review cannot be predicted with certainty since there is little precedent to follow. It is also likely that there may be parallel legislative changes in the Act itself which would alter the law that the court was asked to interpret. Possible outcomes range from free permission to develop to total prohibition. The latter may be followed by a landowner's suit for inverse condemnation, which would be founded on the value of the private land for development as approved by local authorities and the taking of that value by the federal government for the sole purpose of protecting an endangered species. If successful, the suit would require that the prohibition to be removed or that the landowner be reasonably compensated by public funds. If the suit were unsuccessful, the prohibition would prevent development, but the land would remain in private ownership; further legal action may be attempted if the legislative or judicial climate were to change.

In this way, No Action would probably give way to one of the action alternatives after a short term delay. As long as much of SBM is in private ownership, the prospect of development remains.

B. MODIFIED DEVELOPMENT WITH A HCP

The HCP supporting the proposed course of action incorporates a series of specific development plans that are viable for the private landowner and which, in conjunction with the other provisions of the HCP, will have minimal adverse effect on the endangered species. One broad class of alternates is a Section 10(a) permit with a HCP based on a different pattern of development. In order for an alternate development plan to warrant further consideration it must be both implementable and environmentally preferable.

Alternate development patterns have been considered by the San Bruno Mountain Steering Committee in the course of developing the Habitat Conservation Plan. The HCP is a co-operative effort between local land use authorities and the private landowners. In order for the HCP to be implemented, the landowner must retain a reasonable minimum of use and value from his land.

For an alternate development patterns to offer substantially less short-term impact on the endangered species, it must sharply curtail the ground coverage leading to habitat loss. Such curtailed projects are either economically or technically infeasible according to the developer, or they would have social, visual or other environmental impacts that are unacceptable to the surrounding communities. For residential projects, reduced ground coverage either requires fewer dwellings or greater densities. If a reduced number of dwelling units must bear fixed site preparation costs less money is available for off-site improvements which may be needed to mitigate traffic, schools or recreation impacts on nearby communities. Alternately, increased housing densities would require high-rise structures (eg. 12 story buildings were studied for Northeast Ridge). High-rise structures would increase the visual and social contrast of development with the predominantly single-family surroundings.

C. ALTERNATE DEVELOPMENT WITHOUT A HCP

In principle, portions of San Bruno Mountain with no endangered species could be developed without a Habitat Conservation Plan. Strictly speaking, this would mean that no adult, egg, or larva would be present on the site to be destroyed by grading. That requirement would probably preclude even minor development in areas of grassland habitat for the Mission Blue.

For large-scale development to occur, a tract of land of several hundred acres would be needed. The Saddle is the only sizable piece of developable land which has few or none of the endangered species. Because the Saddle is now owned by the State of California, some arrangement would be required to transfer the land back to private ownership. Presumably this could include a trade of the public land for what is now private land.

While the Saddle is now very poor habitat for the Mission Blue, occasional adults have been found there. The foodplant species of lupine are scarce on the western slope of the Guadalupe Hills so that the chance of inadvertent taking of Mission blue by development is low. Direct impact on the Mission Blue would be eliminated by careful planning, but the project would nonetheless eliminate a large area of disturbed grassland and foreclose the option to reclaim this area as habitat. This alternative would not provide the enhancement benefits of the HCP. In addition, the Mission Blue and Callippe Silverspot will still be subject to other impacts addressed by the Plan: industrial/residential development on private land, off-road vehicle activity, exotic species invasion, etc.

The Saddle has a small wetland area which may be the site of several rare plants and possibly of the endangered San Francisco garter snake. There is also sharp variation in microclimates and soil types which could provide habitat not found elsewhere on SBM. Development on the Saddle could be planned to avoid the most sensitive areas, but there would likely be a biological impact greater than that from the proposed County park.

Development on the Saddle would alter the current plans to build a County park on the State owned land. The HCP describes the County park proposal as generally low intensity, primarily passive use of most of the park land with a nature interpretive center, parking, and turf area on the Saddle. If the Saddle were taken for private use, the park would need to omit or relocate these facilities.

The alternative would have significant environmental impacts. Secondary impacts from development would depend on the magnitude of development, but would include significant traffic and visual impacts. In 1976, the community rejected a plan for development on the Saddle, because of anticipated impact and preferable use for the County park (refer to the 1976 General Plan EIR, incorporated herein by reference).

D. CHANGE ENDANGERED CLASSIFICATION

The requirement for a Section 10(a) permit stems from the classification of the Mission Blue as "Endangered" by the US FWS. If the classification were changed to "Threatened", the prohibition against taking (Section 9) could be

removed, if special regulations were promulgated by the Department of Interior. However, the requirement for consultation (Section 7) would remain, possibly affecting the involvement of federal agencies in the projects. If the butterfly were removed from the endangered species list as no longer endangered, the present legal constraint to development would be removed.

In either case, none of the mitigation and enhancement provisions of the HCP would be available to protect the Mission Blue. All of the present threats to the species would remain, and it is likely that unconstrained development or even protracted inaction would significantly increase the likelihood of extinction for the subspecies. No scientific evidence has been advanced to support such de-listing or reclassification to threatened status.

E. PUBLIC ACQUISITION

Public acquisition of private land would increase the amount of land conserved. This would require fair market purchase of roughly 1200 acres at an estimated cost of $120,000,000 in 1982 dollars. Public funding of the enhancement program would require at least $25,000 annually with optimum funding of approximately $60,000 annually.

As proposed, the HCP is a means to convey private lands to public ownership for conservation and to provide perpetual funding for enhancement activities at much less cost to the public. If public monies are used instead for this purpose, there would be a corresponding reduction in funding for other public programs. It is most likely that purchase would be pursued by the US FWS under Section 5 of the Act, and thus conservation on SBM would occur at the expense of conservation elsewhere.

Historically, the US FWS has aquired endangered species habitat in private lands through the Land and Water Conservation Fund (LWC). Five different authorities compose the LWC and all acquisitions are incorporated into the National Wildlife Refuge System. The National Forest Service, the Bureau of Land Management and the National Park Service also have access to these funds, and some of their projects may have included acquisition of critical habitat. Between fiscal year 1967 and fiscal 1981 there were a total of twenty-five projects with locations all over the country, including such states as California, Florida, Georgia, Hawaii, Kentucky, Virginia and Washington. Some of these projects are still in process. During those fourteen years a total of 72,918 acres were aquired for a total expenditure under LWC of $54,162,163. Table VI-1 shows the projects in California during that period (Management Operations, US FWS Office of Endangered Species, pers. comm.).

Given the nature of past appropriations by the LWC, and given that available funds for federal land aquisition in fiscal 1983 and 1984 will probably be significantly less than in the past, with several projects already in process competing for those funds, it seems unlikely that the Mountain's private lands could be publicly acquired, even at a quarter of the estimated cost, without soliciting unusual sources for the money or accumulating it incrementally over an extremely long period of time. The estimated fair market value of those lands significantly exceeds the amount spent on all California projects in the history of the LWC. While their are important

local benefits to come from conservation of those lands, there would be serious negative impacts on nation-wide conservation efforts if major portions of these public funds were redirectd by LWC toward covering this cost. Under the HCP, on the other hand, adequate private funds would be secured to maintain the SBM open space in perpetuity, free from competition with other conservation efforts, and from the tenuous availability of federal monies.

TABLE VI-1
LWC ACQUISITION PROJECTS IN CALIFORNIA, 1967-1981

Species	Year(s) Aquired	Acreage	Cost
Aleutian Canada Goose	1980	13.89	$ 41,250
Blunt Nosed Leopard Lizard	1981	1020.98	1,121,000
California Condor	1974	1871.00	510,000
Santa Cruz Long-toed Salamander	1976,77,78	123.05	556,000
Lang's Metalmark Butterfly	1980	55.38	2,135,000
Light-footed Clapper Rail	1981	407.00	7,655,000
TOTAL CALIFORNIA 1967 - 1981			$12,018,250

Source: Management Operations, US FWS Office of Endangered Species, personal communicaton.

VII. GROWTH INDUCING IMPACTS

The growth inducing impacts of issuing the Section 10(a) permit and implementation of the Habitat Conservation Plan can be interpreted in two ways. The first is that issuing the Section 10(a) permit will allow development, which would not have been able to have taken place if the permit was not issued, and therefore, is inducing the growth of 3,021 dwelling units and some commercial buildings on the Mountain. This interpretation assumes that no weakening of the Endangered Species Act takes place in the foreseeable future. The second interpretation is that development on the Mountain is inevitable regardless of the presence of endangered species. If, for instance, endangered species law were weakened by legislation or judicial review, (i.e. the Endangered Species Act were to exclude insects or subspecies, or if there were no application of the Act to private land), there would no longer be any legal reason to prohibit development in areas so designated in the various cities and county general plans.

In assessing the growth inducement of the HCP vs. the general plans, it appears that the general plans are much less restrictive than the HCP and would therefore ultimately permit more growth than would the HCP. For instance, amendments to general plans could permit infilling around the developments, densities could be increased, and possibly engineering criteria could change which would allow development on steeper slopes and ridgetops.

The HCP has identified and assessed biological impacts on all areas currently proposed for development on San Bruno Mountain. The result of Plan implementation would be that no further development could take place on San Bruno Mountain without going through a strict approval process. This process includes: a noticed public hearing, a report which includes a biological study which demonstrates that the project does not conflict with the primary purpose of the HCP, and written approval from the local jurisdictions, San Mateo County, and the U.S. Fish and Wildlife Service. An amendment to a General Plan is less difficult since only one jurisdiciton must grant approval. The HCP amendment process would make further development on the Mountain difficult.

In addition, it is widely known that San Bruno Mountain is one of the few areas left on the Northern Peninsula which is suitable for major development projects. The projects are not setting a precedent by opening up large open space areas for further development, the services provided for each development is only supplying the specific development (i.e. new roads only allow access into the specific project), and because the HCP prevents further development to take place, the adjoining land values are not increasing; the traditional growth inducing criteria are absent. Development associated with the HCP appears not to create significant growth inducing impacts.

VIII. THE RELATIONSHIP BETWEEN THE SHORT TERM USES OF MAN'S ENVIRONMENT AND THE MAINTENANCE AND ENHANCEMENT OF LONG-TERM PRODUCTIVITY/ SIGNIFICANT IRREVERSIBLE ENVIRONMENTAL CHANGES

The Section 10(a) permit with the Habitat Conservation Plan as a condition is, in essence, a model case of short-term loss or compromise in expectation of a long-term benefit. Should the 10(a) permit be granted, this would relieve the greatest impediment now delaying large-scale development (3000+ units) on San Bruno Mountain which would then take place over the next 5 years. This development would cause the virtually irreversible loss of about 370 acres of open space, and its commitment to urban development. About 300 acres of this open space is now grassland habitat for the Mission Blue and Callippe Silverspot butterflies. The butterflies would thus suffer the loss, and foreclosure of future use of 13 and 7 percent of their respective habitat. An additional 200 acres of grassland and brush is in parcels not yet planned under the HCP. Some of the currently unplanned land could be developed under the 10(a) permit if the local land use authorities approve and if the landowners agree to comply with the conditions set forth for their parcels in the HCP. This 200 acres represents little additional Mission Blue habitat but another 7% of existing Callippe habitat. Such development will be subject to separate public and governmental review at the time of consideration.

The HCP also represents the foreclosure of options by the landowners -- the option to develop more of their land than allowed by the HCP. In exchange for the approval to develop 368 acres of land, the private landowners are permanently foregoing, in their dedication of the land to public ownership as conserved habitat, the right to develop an additional 1200 acres they now own. The habitat is to be set aside concurrent with the last stages of development approval. The HCP contains an amendment process which makes it extremely difficult, if not impossible for any urban land use to take place on any conserved habitat.

The urban development projects permitted under the 10(a) permit will consume the amount of non-renewable natural resources necessary for a modern developments on the scale of 3000 dwelling units, including gasoline and fuel oil for construction equipment, asphalt, sheet metal, copper wire and the like. In approving the projects, the local agencies have determined that these amounts are not excessive for the benefit they provide in additional housing, and have determined that local conservation options have been applied, where possible. Such options include passive and active solar heating and air conditioning, insulation, water conserving plumbing and the like. The residents will consume non-renewable energy resources such as natural gas for cooking and gasoline for automobile travel. Travel impacts should be mitigated in the transportation measures outlined in the master traffic study for the San Bruno Mountain area and the individual project EIR's.

By allowing a certain, specified amount of development and associated habitat loss in the short-term, the 10(a) permit simultaneously is supposed to provide for a long-term benefit to the endangered butterflies, other species of concern and to the overall ecological value of the Mountain in the indefinite future. The many provisions of the Plan that go beyond the simple allowance of development were created to counteract the threats to these endangered species and the Mountain's natural habitat areas which would exist

even in the total absence of the planned development projects. The long-term benefit that the Plan seeks for these resources includes:

o the maintenance of species diversity within the grassland including the presence of host plants for the endangered butterflies, and of plants endemic to the Bay region;

o the control and eradication of invasive species (primarily gorse and eucalyptus) which are progressively encroaching on and destroying the grassland habitat, and the re-establishment of grassland in these areas. If successful, this measure could restore over 500 acres of degraded habitat;

o the control of the spread of native brush into grassland, while protecting important resources of the brush community;

o the control of habitat abuse on the Mountain, including off-road vehicle activity and arson, accompanied by a general increase in public use;

o the provision of a permanent biological reserve, under the stewardship of a public agency where ecological processes may be studied intensively over long periods of time by qualified researchers. The knowledge gained in this way should improve our understanding of the Mountain and the ecosystem of which it is a part, which in turn can suggest ways to better preserve its valuable resources.

In the evaluation of short-term loss versus long-term gain, it is important to recognize that the development is critical to the Plan's implementation since it provides additional public land and funding in perpetuity without which the other provisions of the Plan would cease to be implementable. In principle, with No Action or delay, the land could be held in open space until a source of public funding could be found both to buy the private parcels and to implement the conservation provisions of the Plan. In reality the wait for public funding could be, in all probability, so long that by the time it was realized the ecology of Mountain could be far more degraded than it is today just through the continuing action of the adverse natural processes and human activities which now operate.

IX. SIGNIFICANT ENVIRONMENTAL EFFECTS AND UNAVOIDABLE ADVERSE EFFECTS

The issuance of the Section 10(a) permit and implementation of the HCP would result in some significant environmental effects. These are mainly the conservation of open space and the alteration of existing vegetative patterns in some areas. Those with significant unavoidable adverse effects are connected to the permitted development - both the direct impact of grading and the indirect impacts of construction and operation. These impacts include a short term loss of butterfly habitat which will be mitigated by the Plan, and the impacts of development on such concerns as energy use, air quality, traffic, and aesthetics.

The proposed action will instigate the conservation of almost 2,800 acres of open space on San Bruno Mountain. Approximately 2000 acres are already owned by San Mateo County; an additional 800 acres will be transferred to county ownership once limited development takes place. This is a significant environmental effect since the "conserved habitat" will be held indefinitely and will be managed for the purpose of protecting the Mountain's ecology and for providing habitat for several species in perpetuity. The conservation of the open space and the operation of the Park will also benefit the surrounding urban communities which now suffer from a lack of similar recreational areas.

The HCP will also alter the composition of plant species on some areas of the Mountain. The major change will be the gradual transition of areas currently composed of exotic species (primarily gorse and eucalyptus) to areas of grassland and native plant species. This change will benefit the native plant species and animals of concern, but will also gradually displace the wildlife (i.e. rabbits and birds) which utilize the exotics as habitat. In addition, in order to conserve the habitat, the HCP requires better control of off-road vehicle activity, and development can limit access to areas where arson fires now commonly start, such as the South Slope.

The major significant unavoidable adverse effect brought about by the issuance of the Section 10(a) permit and HCP is the short-term loss of the habitat of 13% of the Mission Blue and 7% of the Callippe Silverspot population which may result in an increased possibly of extinction, and the taking of individuals during development-related grading. The open space lost is also habitat for other animals and native plants. This adverse effect will be mitigated over the long term by enhancement activities which will be funded by the developments.

The cumulative indirect impacts of associated development are unavoidable adverse effects. These impacts consist of increased consumption of fossil fuels, and development related impacts on air and water quality, traffic, aesthetics, and development related services. These effects will also be addressed on a project by project basis in the individual project EIRs.

X. REFERENCES

A. LITERATURE CITED

Arnold, R.A. "Ecological Studies on Six Endangered Butterflies (Lepidoptera: Lycaenidae); Island Biogeography, Patch Dynamics, and the Design of Habitat Preserves." Ph.D. Thesis, University of California, Berkeley.

Arnold, R.A. "Status of Proposed Threatened or Endangered California Lepidoptera". State of California Department of Fish and Game, Non-Game Wildlife Investigations.

Bay Area Air Quality Management District. "Contaminant and Weather Summary", editions from March 1978 to September 1980. BAAQMD, San Francisco, California.

Barry, S.J. 1978. "Status of the San Francisco Garter Snake". California Department of Fish and Game, Inland Fisheries Endangered Species Program. Special Publication 78-2.

Bonilla, M.G. 1971. Preliminary geologic map of the San Francisco South quadrangle and part of the Hunters Point quadrangle, California. U.S. Geological Survey Misc. Field Studies Map MF-311.

Cadillac-Fairview Homes West. January 1982 draft, rev. 2-9-82. Proposed Development Plan, Northeast Ridge, San Bruno Mountain.

California Division of Forestry. Maps, 1932.

City of South San Francisco. 1980. Open Space Element of the General Plan.

Cooper & Clark Consulting Engineers. October 20, 1972. Preliminary soil engineering and engineering geologic studies, Re: Development feasibility & construction considerations, proposed Visitacion Rancho Residential Development, San Bruno Mtn., San Mateo County, California. Prepared for Amfac, Inc.

Cooper, Clark & Associates. October 19, 1971. Consideration of Seismic and other geologic hazards, Visitacion Rancho, San Mateo County, California. prepared for the Crocker Land Company.

Del Davis Associates, Inc. August 1976. Final Environmental Impact Report, San Bruno Mountain County Park, San Mateo County, California.

Hahn, Wise and Associates. 1980. General Plan: 1969, South San Francisco, California.

Hahn, Wise and Associates. 1972. Open Space Element, General Plan: 1972 South San Francisco.

Hanes, Ted L. 1977. "California Chaparral". In Terrestrial Vegetation of California. M.G. Barbour, J. Major (eds.). John Wiley and Sons, New York. 1977.

Harding-Lawson Associates. June 25, 1974. Geologic study, Visitacion Rancho

Harding-Lawson Associates. October 28, 1974. Preliminary geotechnical

Heady, Harold F. 1977. "Valley Grassland". In Terrestrial Vegetation of California. M.G. Barbour, J. Major (eds.). John Wiley and Sons, New York.

Heady, Harold F., Theodore C. Foin, Mary M. Hektner, Dean W. Taylor, Michael G.Barbour, W. James Barry. 1977. "Coastal Prarie and Northern Coastal Scrub." In Terrestrial Vegetation of California. M.G. Barbour, J. Major (eds.). John Wiley and Sons, New York. 1977.

Holman, Miley Paul. May 2, 1974. Archaeological Reconnaissance in Crocker Hills General Plan Amendment Draft Environmental Impact Report, Appendix M.

Inouye/Dillingham Landscape Architects. May 1982. General Plan -- San Bruno Mountain State and County Park, San Mateo County, California.

Ironside and Associates. March 1982. Carter-Martin Extension Draft Environmental Impact Report.

Ironside and Associates. August 1981. Rio Verde Heights Draft Environmental Impact Report.

Ironside and Associates. July 24, 1978. Daly City General Plan Report.

Ironside and Associates. January 28, 1980. Brisbane General Plan Report.

Ironside and Associates. August, 1981. Rio Verde Estates Draft Environmental Impact Report.

Knott, J. M. February 22, 1973. Effects of urbanization on sedimentation and floodflows in Colma Creek basin, California. U.S. Geological Survey Open-File Report.

Larry Seeman Associates, Inc. October 1981. "Soil-Plant Study of the Northeast Ridge of San Bruno Mountain." #81-004.

Larry Seeman Associates, Inc. September 1981. Northeast Ridge San Bruno Mountain Environmental Assessment". LSA #81-004, Berkeley, California.

Martin-Carpenter Associates. December, 1981. Reclamation Plan for Quarry Products, Incorporated, Guadalupe Valley Quarry.

McBride, J.R. 1974. "Plant Succession in the Berkeley Hills, California." Madrono Vol. 22 no. 7 p. 317-329.

McBride, J.R. and H.F. Heady. 1968. "Invasion of Grassland by Baccharis pilularis DC". J. Range Mgt. 21:106:108.

McClintock, E., Walter Knight and Neil Fahy. November 1968. A Flora of the San Bruno Mountains, San Mateo County, California. Proc. Cal. Acad. Sci. XXXII:20 p. 587-677.

Murphy, D.D. and P.R. Ehrlich. 1980. "Two California Checkerspot Butterfly Subspecies: One New, One on the Verge of Extinction". J. Lep. Soc. 34(3): 316-320.

State of California Resources Agency, Fish and Game Commission, and Department of Fish and Game. December 1980. At the Crossroads 1980: A Report on California's Endangered or Rare Fish and Wildlife.

SWA Group. 1975. Draft Environmental Impact Report for Brisbane Quarry.

Thomas Reid Associates. May 1982. Endangered Species Survey, San Bruno Mountain -- Biological Study, 1980-1981.

Thomas Reid Associates. May 1982. San Bruno Mountain Area Habitat Conservation Plan -- Draft, Volume 1.

Torrey and Torrey, Incorporated. November, 1981. Draft Environmental Impact Report: Brisbane School Site, Proposed Annexation and Prezoning.

Torrey and Torrey, Incorporated. November 1980. Final Environmental Impact Report for Reservoir Hill.

URS Research Company. January 1975. Draft Environmental Impact Report -- Application for a General Plan Amendment: Crocker Hills, Volume 2.

US EPA, August 1977. AP 42: Compilation of Air Pollutant Emission Factors. Third Edition. US EPA, Research Triangle Park, North Carolina.

Wilson, Steven and Steven Deitz. June 1974. Report of the Archaeological Reconnaissance of the Proposed San Bruno Mountain County Park. Prepared by Archaeologic Consulting and Research Services, Mill Valley, CA.

Wright, Henry A. 1971. "Shrub Response to Fire". In Wildland Shrubs - Their Biology and Utilization. USDA Forest Service General Technical Report INT-1, 1972.

B. PERSONS AND ORGANIZATIONS CONSULTED

R.A. Arnold, Ph.D., University of California, Berkeley, California

Len Beyea, San Mateo County Planning Department

Dan Dyer, California Division of Forestry

Richard Garlinghouse, Cadillac-Fairview Homes West, San Francisco, California

Philip Gorney, Senior Planner, South San Francisco, California

Don Fleming, Director of Community Development, Daly City, California

Brad Kerwin, City Manager, Brisbane, California

Robert Langston, Thomas Reid Associates

Bob Matson, Bay Area Air Quality Management District

Joe McBride, School of Forestry and Conservation, University of California, Berkeley

Dennis Murphy, Department of Biological Sciences, Stanford University, Stanford, California

Jack Neeley, Pacific Gas and Electric

Steve Nicola, California Department of Fish and Game

Bill Rozar, Planner, San Mateo County, California

Battina Sparrowe, U.S. Fish and Wildlife Service, Office of Endangered Species, Land Aquisition Specialist

Ralph Swanson, U.S. Fish and Wildlife Service, Office of Endangered Species

C. REPORT PREPARATOR

Thomas Reid Associates

Karen Weissman	A.B. Degree in Zoology, University of California, Los Angeles. Ph.D Degree in Biology, Stanford University. Member, American Association for the Advancement of Science.
Thomas S. Reid	B.S. Degree in Chemistry, Yale University. National Science Foundation graduate fellowship, Biology, Stanford University 1869-1972. Member, Assciation of Environmental Professionals and American Chemical Society.
Victoria Harris	B.S. Degree in Conservation of Natural Resources, U. C. Berkeley. Candidate for M.U.P. Degree at San Jose State University. Member, Association of Environmental Professionals and American Planning Association.
Tay Peterson	A.B. Degree in Human Biology, Stanford University.
William F. Gallagher	B.A. Degree in Biology and Environmental Studies, U.C. Santa Cruz. Candidate for M.S. Degree in Environmental Management, University of San Francisco. Member, Association of Environmental Professionals.

APPENDIX A -- SPECIES LIST

LIST 1[a]

AMPHIBIANS		
Pacific Giant Salamander	*Dicamptodon ensatus*	E
California Tiger Salamander	*Ambystoma tigrinum californiense*	E
Northern Rough-Skinned Newt	*Taricha granulosa granulosa*	E
Coast Range Newt	*Taricha torosa torosa*	O
Ensatina	*Ensatina eschscholtzi*	E
California Slender Salamander	*Batrachoseps attenuatus*	O
Arboreal Salamander	*Aneides lugubris*	O
Western Spadefoot Toad	*Scaphiopus hammondi*	E
California Toad	*Bufo boreas halophilus*	O
Pacific Treefrog	*Hyla regilla*	E
California Red-Legged Frog	*Rana aurora draytoni*	O
Bullfrog	*Rana catesbeiana*	E
Foothill Yellow-Legged Frog	*Rana boylei*	E
REPTILES		
Northwestern Fence Lizard	*Sceloporus occidentalis occidentalis*	O
Northern Sagebrush Lizard	*Sceloporus graciosus graciosus*	O
California Horned Lizard	*Phrynosoma coronatus frontale*	P
Western Skink	*Eumeces skiltonianus skiltonianus*	O
California Alligator Lizard	*Gerrhonotus multicarinatus multicarinatus*	O
San Francisco Alligator Lizard	*Gerrhonotus coeruleus coeruleus*	O
Pacific Rubber Boa	*Charina bottae bottae*	O
Pacific Ringneck Snake	*Diadophis punctatus amabilis*	O
Sharp-Tailed Snake	*Cotina tenuis*	E
Alameda Striped Racer	*Masticophis lateralis euryxanthus*	E
Western Yellow-Bellied Racer	*Coluber constrictor mormon*	O
Pacific Gopher Snake	*Pituophis melanoleucus catenifer*	O
California Kingsnake	*Lampropeltis getulus californiae*	O
California Red-Sided Garter Snake	*Thamnophis sirtalis infernalis*	O
San Francisco Garter Snake	*Thamnophis sirtalis tetrataenia*	E
Coast Garter Snake	*Thamnophis elegans terrestris*	O
Aquatic Garter Snake	*Thamnophis couchi aquaticus*	O
Northern Pacific Rattlesnake	*Crotalus viridis oreganus*	E
BIRDS		
Strigiformes		
Tyto alba	Barn Owl	E
Otus asio	Screech Owl	E
Bubo virginianus	Great Horned Owl	E
Steotyto cunicularia	Burrowing Owl	E
Asio flammeus	Short-Eared owl	E

a - Taken from the Final EIR, San Bruno Mountain County Park, August 1976 by Del Davis Associates

O = Observed on San Bruno Mountain
E = Expected on San Bruno Mountain

APPENDIX A -- SPECIES LIST

Apodiformes		
Selasphorus sasin	Allen's Hummingbird	O
Calypte anna	Anna's Hummingbird	O
Selasphorus rufus	Rufous Hummingbird	E
Piciformes		
Colaptes cafer	Red-Shafted flicker	O
Falconiformes		
Cathartes aura	Turkey Vulture	O
Accipiter striatus	Sharp-shinned Hawk	E
Accipiter cooperii	Cooper's Hawk	O
Buteo jamaicensis	Red-tailed Hawk	O
Buteo lineatus	Red-shouldered Hawk	E
Buteo swainsoni	Swainson's Hawk	O
Buteo regalis	Ferruginous Hawk	E
Aquila chysaetos	Golden Eagle	E
Circus cyaneus	Marsh Hawk	E
Falco sparverius	American Kestrel	
Galliformes		
Lophortyx californicus	California Quail	O
Charadriiformes		
Charadrius alexandrinus	Snowy plover	E
Charadrius vociferus	Killdeer	O
Larus occidentalis	Western Gull	E
Columbiformes		
Columba fasciata	Band-tailed Pigeon	E
Columba livia	Rock dove	O
Zenaida macroura	Mourning dove	O
Passeriformes		
Tyrannus verticalis	Western kingbird	E
Myiarchus cinerascens	Ash-Throated flycatcher	E
Sayornis nigricans	Black phoebe	E
Sayornis saya	Say's phoebe	E
Empidonax difficilis	Western flycatcher	E
Contopus sordidulus	Western wood pewee	E
Nuttallornis borealis	Olive-Sided flycatcher	E
Eremophilia alpestris	Horned lark	E
Tachycineta thalassina	Violet-green swallow	O
Iridoprocne bicolor	Tree swallow	E
Stelgidopteryx ruficollis	Rough-winged swallow	O
Hirundo rustica	Barn swallow	O
Petrochelidon pyrrhonota	Cliff swallow	O
Progne subis	Purple martin	E
Cyancitta stelleri	Steller's Jay	E
Aphelocoma coerulescens	Scrub jay	O
Corvus corax	Common raven	E
Corvus brachyrhynchos	Common crow	E
Parus rufescens	Chestnut Backed chickadee	O
Parus inornatus	Plain titmouse	E
Psaltriparus minimus	Common bushtit	O

Birds (cont.)

Sitta carolinensis	White-Breasted nuthatch	E
Sitta pygmaea	Pygmy nuthatch	E
Chamaea fasciata	Wrentit	O
Troglodytes aedon	House wren	E
Thryomanes bewickii	Bewick's wren	O
Telmatodytes palustris	Long-Billed marsh wren	E
Mimus polyglottos	Mockingbird	O
Toxostoma redivivum	California thrasher	E
Turdus migratorius	Robin	O
Sialia mexicana	Western bluebird	E
Bobycilla cedrorum	Cedar waxwing	E
Lanius ludovicianus	Loggerhead shrike	E
Sturnus vulgaris	Starling	O
Vireo huttoni	Hutton's vireo	O
Vireo solitarius	Solitary vireo	E
Vireo gilvus	Warbling vireo	E
Vermivora celata	Orange-Crowned Warbler	E
Dendroica petechia	Yellow warbler	E
Dendroica auduboni	Audubon's warbler	E
Geothlypis trichas	Yellowthroat	E
Wilsonia pusilla	Wilson's warbler	O
Passer domesticus	House sparrow	O
Sturnella neglecta	Western Meadowlark	E
Agelaius phoeniceus	Redwinged blackbird	O
Agelaius tricolor	Tricolored blackbird	E
Icterus bullockii	Bullock's Oriole	O
Euphagus cyanocephalus	Brewer's blackbird	O
Molothrus ater	Brown-Headed cowbird	E
Piranga ludoviciana	Western tanager	E
Pheucticus melanocephalus	Black-Headed grosbeak	E
Passerina amoena	Lazuli bunting	E
Carpodacus purpureus	Purple finch	E
Carpodacus mexicanus	House finch	O
Spinus pinus	Pine siskin	E
Spinus tristis	American goldfinch	O
Spinus psaltria	Lesser goldfinch	O
Pipilo erythrophthalmus	Rufous-Sided towhee	E
Pipilo fuscus	Brown towee	O
Passerculus sandwichensis	Savannah sparrow	O
Ammodramus savannarum	Grasshopper sparrow	E
Chondestes grammacus	Lark sparrow	O
Aimophila ruficeps	Rufous-Crowned sparrow	O
Junco oreganus	Oregon junco	E
Spizella atrogularis	Black-Chinned sparrow	E
Zonotrichia leucophrys	White-Crowned sparrow	E
Zonothrichia atricapilla	Golden-Crowned sparrow	E
Zonothrichia albicollis	White-Throated sparrow	E
Passarella iliaca	Fox sparrow	E
Melospiza lincolnii	Lincoln's sparrow	E
Melospiza melodia	Song sparrow	O

APPENDIX A -- SPECIES LIST

MAMMALS

Marsupalia		
Common Opossum	Didelphis marsupialis	O
Insectivora		
Vagrant Shrew	Sorex vagrans halicoetes	E
Ornate Shrew	Sorex ornatus	E
Trowbridge Shrew	Sorex trowbridgii montereyensis	O
Broad-Handed Mole	Scapanus latimanus	E
Shrew-Mole	Neurotrichus gibbsii hyacinthinus	E
Chiroptera		
Little Brown Myotis	Myotis lucifugus	E
Fringed Myotis	Myotis thysanodes	E
California Myotis	Myotis californicus	E
Hairy-Winged Myotis	Myotis volans longicrus	E
Long-Eared Myotis	Myotis evotis evotis	E
Yuma Myotis	Myotis yumanensis saturatus	E
Hoary Bat	Lasiurus cinereus cinereus	E
Red Bat	Lasiurus borealis teliotis	E
Big Brown Bat	Eptesicus fuscus	E
Western Pipistrelle	Pipistrellus hesperus	E
Pallid Bat	Antrozous pallidus pacificus	E
Lump-Nosed Bat	Plecotus townsendii	E
Brazilian Free-Tailed Bat	Tadarida brasiliensis mexicana	E
Lagomorpha		
Black-Tailed Hare	Lepus californicus	O
Audubon Cottontail	Sylvilagus audubonia auduboni	O
Brush Rabbit	Sylvilagus bachmani macrorhinus	O
Rodentia		
California Ground Squirrel	Citellus beecheyi	O
Merriam Chipmunk	Eutamias merriami pricei	E
Western Gray Squirrel	Sciurus griseus	E
Botta Pocket Gopher	Thomomys bottae bottae	E
Great Basin Pocket Mouse	Perognathus parvus	E
Santa Cruz Kangaroo Rat	Dipodomys venustus	E
Western Harvest Mouse	Reithrodontomys megalotis longicaudus	O
California Mouse	Peromyscus californicus parasiticus	O
Brush Mouse	Peromyscus boylii	E
Pinyon Mouse	Peromyscus truei dyselius	E
Deer Mouse	Peromyscus maniculatus gambelii	O
Dusky-Footed Wood Rat	Neotoma fuscipes annectens	E
California Meadow Mouse (Vole)	Microtus californicus californicus	O
House Mole	Mus musculus	O
Carnivora		
Gray Fox	Urocyon cinereoargenteus townsendii	O
Coyote	Canis latrans	E
Raccoon	Procyon lotor psora	O
Ringtail	Bassariscus astutus	E
Long-Tailed Weasel	Mustela frenata nigriauris	O
Badger	Taxidea taxus neglecta	E

Mammals (cont.)		
Striped Skunk	Mephitis mephitis occiedntalis	O
Spotted Skunk	Spilogale putorius	E
Bobcat	Lynx rufus californicus	E
Domestic Cat/Feral Cat	Felis domesticus	O
Artiocactyla		
Mule Deer	Odocoiletus hemionus columbianus	E

LIST 2[b]

Amphibians	
Pacific Giant Salamander	E
Tiger Salamander	E
Rough-skinned newt	E
California newt	E
Ensatina	E
California slender salamander	O
Arboreal salamander	O
Santa Cruz black salamander	E
Western spadefoot toad	E
Western (California) toad	O
Pacific treefrog	O
Red-legged (California) frog	O
Yellow-legged frog	E
Bullfrog	E
Reptiles	
Western fence lizard	O
Side-blotched (California) lizard	E
California Coast horned lizard	E
Western skink	E
California western whiptail	E
California southern alligator lizard	O
Silvery California legless lizard	E
Pacific rubber boa	E
Pacific ringneck snake	O
Sharp-tailed snake	E
Striped racer	O
Western yellow-bellied racer	E
Pacific gopher snake	O
California Coast mountain kingsnake	E
California common kingsnake	E

b - From Draft EIR on Application for a General Plan Amendment: Crocker Hills, Volume 2, January 1975, by URS Research Company

O = Observed on San Bruno Mountain
E = Expected on San Bruno Mountain

Reptiles (cont.)	
San Francisco garter snake	O
California red-sided garter snake	O
Western Coast terrestrial garter snake	O
Santa Cruz western aquatic garter snake	O
Northern Pacific western rattlesnake	E
Birds	
American Vultures	
Turkey vulture	O
Kites, Hawks, Harriers	
White-tailed kite	E
Sharp-shinned hawk	E
Cooper's hawk	O
Red-tailed hawk	O
Rough-legged hawk	O
Golden eagle	O
Marsh hawk	E
Falcons	
Sparrow hawk	O
Quails, Pheasants	
California quail	O
Plovers	
Killdeer	O
Pigeons, Doves	
Band-tailed pigeon	O
Rock dove	O
Mourning dove	O
Barn Owls	
Barn Owl	E
Typical Owls	
Screech owl	E
Great Horned Owl	E
Swifts	
Vaux's swift	E
White-throated swift	E
Hummingbirds	
Anna's hummingbird	O
Rufous hummingbird	E
Allen's humminngbird	O
Woodpeckers	
Common flicker (red-shafted flicker)	O
Lewis' woodpecker	E
Red-breasted sapsucker	O
Hairy woodpecker	E
Downey woodpecker	E

Birds (cont.)	
Nuttall's woodpecker	E
Tyrant Flycatchers	
Western kingbird	E
Say's phoebe	E
Western flycatcher	E
Olive-sided flycatcher	E
Larks	
Horned lark	O
Swallows	
Violet-green swallow	O
Rough-winged swallow	O
Barn swallow	O
Cliff swallow	O
Jays, Magpies, Crows	
Steller's Jay	E
Scrub jay	O
Common raven	O
Common crow	E
Titmice, Verdins, Bushtits	
Chestnut-backed chickadee	O
Plain titmouse	O
Common bushtit	O
Nuthatches	
White-breasted nuthatch	E
Red-breasted nuthatch	E
Pygmy nuthatch	E
Creepers	
Brown creeper	E
Wrentits	
Wrentit	O
Wren	
House wren	E
Winter wren	E
Bewick's wren	E
Rock wren	E
Mockingbirds and Thrashers	
Mockingbird	O
California thrasher	E
Thrushes, solitaires	
Robin	O
Varied thrush	E
Hermit thrush	E
Swainson's thrush	E

Birds (cont.)	
Western bluebird	E
Gnatcatchers, Kinglets	
Golden-crowned kinglet	E
Ruby-crowned kinglet	E
Pipts, Wagtails	
Water pipit	E
Waxwings	
Cedar waxwing	E
Shrikes	
Loggerhead shrike	O
Starlings	
Starling	O
Vireos	
Hutton's vireo	E
Solitary vireo	E
Warbling vireo	O
Wood Warblers	
Orange-crowned warbler	O
Yellow warbler	E
Yellow-rumped warbler	O
Townsend's warbler	E
Yellowthroat	E
Wilson's warbler	O
Weaver Finches	
House Sparrow	O
Blackbirds, Orioles	
Western meadowlark	O
Red-winged blackbird	O
Northern oriole (Bullock's oriole)	O
Brewer's blackbird	O
Brown-headed cowbird	E
Tanagers	
Western tanager	E
Finches, Sparrows	
Black-headed grosbeak	E
Lazuli bunting	E
Evening growbeak	E
Purple finch	O
House finch	O
Pine grosbeak	E
Pine siskin	E
American goldfinch	O
Lesser goldfinch	O

Birds (con't)	
Red crossbill	E
Rufous-sided towhee	O
Brown towhee	O
Savannah sparrow	O
Lark sparrow	E
Dark-eyed junco (Oregon junco)	O
Chipping sparrow	O
White-crowned sparrow	O
Golden-crowned sparrow	O
Fox sparrow	O
Song sparrow	O
Mammals	
Opossum	O
Black-tailed hare (jackrabbit)	O
Pacific shrew	O
Audobon cottontail	O
Ornate shrew	O
Brush rabbit	O
Trowbridge shrew	E
Beechey ground squirrel	O
Broad-handed mole	O
Merrian Chipmunk	E
Little brown bat	O
Western gray squirrel	E
Fringed myotis	E
Botta pocket gopher	O
California myotis	E
California pocket mouse	E
Hairy-winged myotis	E
Santa Cruz kangaroo rat	E
Long-eared myotis	E
Western harvest mouse	O
Yuma myotis	E
California (deer) mouse	O
Hoary bat	E
Dusty-footed wood rat	E
Red bat	E
California meadow mouse	O
Big brown bat	E
Black rat	E
Western pipistrelle	E
House mouse	O
Pallid bat	E
Gray fox	E
Lump-nosed bat	E
Raccoon	O
Mexican or Brazilian free-tailed bat	E
Long-tailed weasel	E
Striped skunk	E
Spotted skunk	E
Mule (black-tailed) deer	E