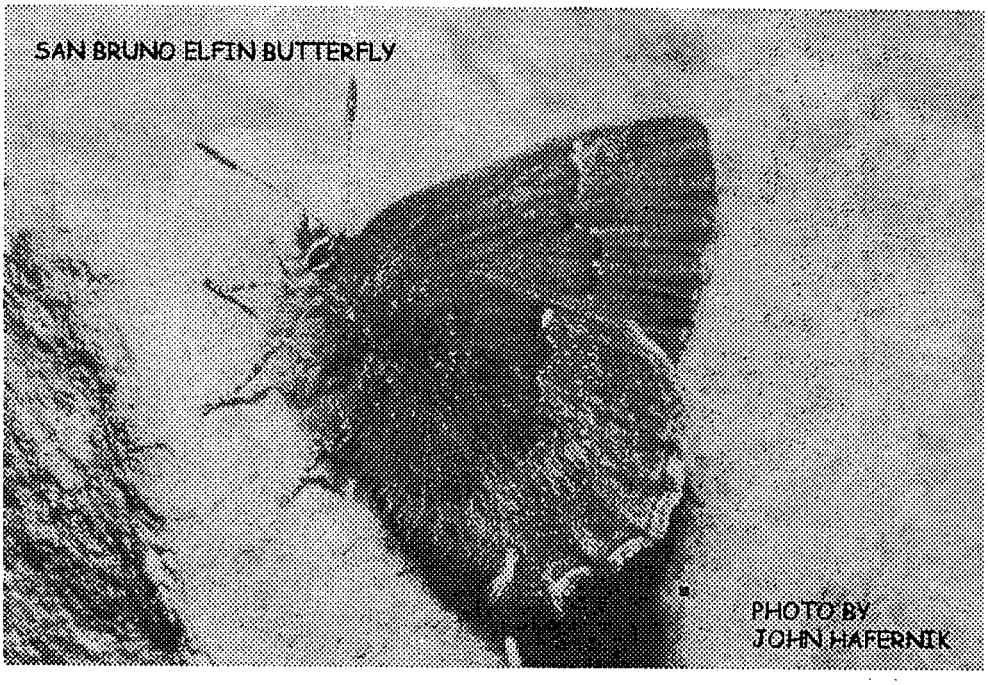
SAN BRUNO MOUNTAIN
HABITAT CONSERVATION PLAN

1999 ACTIVITIES REPORT
FOR ENDANGERED SPECIES PERMIT PRT 2-9818

JANUARY 2000



Prepared for San Mateo County and
the U.S. Fish and Wildlife Service

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INTRODUCTION

This report describes biological and development related activities which took place on San Bruno Mountain under Endangered Species Act Section 10(a) Permit PRT 2-9818 for the 1999 Calendar year. It provides information on the relative population status of the butterflies of concern, exotic species control work, and development activities. Anyone interested in reviewing field data or other information collected by Thomas Reid Associates should contact Patrick Kobernus at (650) 327-0429 or Roman Gankin at (650) 363-1826.

1. STATUS OF SPECIES OF CONCERN

a. Mission Blue Butterfly (*Icaricia icarioides missionensis*)

Methods

Two monitoring methods were used in 1999 to assess the status of the Mission blue butterfly: set transects established in 1998, and wandering transects which have been used since 1982. Set transects are 50-meter-long transects marked in the field that are surveyed frequently during the flight season. These transects provide repeatable, site specific data on butterfly presence/absence and vegetation characteristics. Wandering transects are routes that cover large areas (up to a mile) of the Mountain and are monitored typically 1-2 times during the butterfly flight season. The wandering transects provide distribution data on the butterflies, and allow monitors to check on the status of butterfly habitat in remote areas of the park.

Data Analysis— Wandering Transects

Typically, the Mission blue begins adult flight in March and is most abundant in April. However the cold spring of 1999 (the months of January, February, and March were 3-4 degrees cooler in 1999 than in 1998) deferred emergence until April, and the season extended into June. Rainfall was abundant for the third year in a row, as the Mountain received over 32 inches for the 1998-99 rain year.

The 161 adults observed in the 41-hour monitoring period resulted in a sightings per hour (S/H) figure of 3.9. The 1999 S/H figure is equal to the fifteen year average S/H figure which is also 3.9. Refer to Table 1 for an annual summary of person hours, sightings, and S/H for the Mission blue (MB) monitoring period 1982 to 1999. The locations of each adult butterfly observation is shown in Figure 1.

Using a standard formula derived in 1982, but modified in 1999 to reflect grassland habitat loss due to development (see Appendix A for explanation of formula), the sightings per hour data is used to determine relative population size for the entire population as well as for each colony. The numerical results are input into a computer graph spreadsheet and the data is depicted in graph form (see Figure 2). The distribution data is input directly from the field maps into a computer map of San Bruno Mountain. All figures are included at the end of this report.

Table 1. Mission Blue Monitoring on SBM: 1982 - 1999.

Year	Total Hours	Total sightings *	Sightings/ hour
1982	108.25	338	3.1
1983	61.25	149	2.4
1984	77.75	328	4.2
1985	110.0	293	2.7
1986	102.75	494	4.8
1987	92.0	534	5.8
1988	207.0	883	4.3
1989	115.0	684	5.9
1990	**	608	**
1991	**	433	**
1992	123.0	673	5.5
1993	130.0	320	2.5
1994	118.25	327	2.8
1995	55.5	206	3.7
1996	76.5	312	4.1
1997	78.0	256	3.3
1998	set transects only	set transects only	set transects only
1999	39.50	148	3.7

NOTES:

* The totals provided are the total butterflies observed for productive wandering transects only which is used in the level of effort calculations. This total is usually slightly lower than the total of all butterflies observed for all transects.

** The annual reports for these years do not include level of effort data.

In 1999, most of the wandering transects took place within the Southeast Ridge sub-colony of the Mission blue (See Figure 3). This area comprises the majority of Mission blue habitat on San Bruno Mountain, but due to difficulty of access and steep slopes, it has not been as frequently surveyed as other parts of the Mountain. In 1999, this area was covered thoroughly and Mission blue observations, lupine patches and fennel and broom infestations were mapped. Observations of Mission blues and *Lupinus albifrons* habitat were made in previously undocumented areas on the steep south-facing ridges above the Terrabay Phase 1 development. Observations of Mission blues and *Lupinus formosus* habitat were also made in previously undocumented areas

above the Phase 3 (commercial) area of Terrabay. Other areas surveyed included Colma Creek, West Peak area, Saddle, Point Pacific, Northeast Ridge, Owl and Buckeye Canyons, and Juncus Ravine.

Note that commencing in 1999 all wandering transect data presented in the annual reports will include the routes walked during the transect (Figures 3 and 9). This detail will provide data on where surveys took place and, alternatively, will show which areas where not surveyed.

Data Analysis— Set Transects

In 1998, 28 set transects (each 50 meters long and 5 meters wide) were installed and monitored in various parts of the Mountain. Due to the difficulty in monitoring all of the set transects and conducting wandering surveys during the available good weather windows, the number of set transects was reduced to 14 in 1999.

Ideally each transect is monitored once every 7-10 days (the average adult life span for the Mission blue) and all transects are surveyed during warm, calm weather conditions within 1-2 days of one another. Each 50 meter transect is walked in approximately 2.5 minutes by one or two people. After the transect observation period ends, average wind speed (1 minute duration), maximum wind speed, air temperature, and humidity are recorded. Any butterflies observed inside the transect just before or after the monitoring period are included as transect observations. All butterflies observed outside of the transect or in the transect vicinity during travel between transects are recorded as incidental observations.

All set transects were monitored or attempted to be monitored during the best available weather window (approximately every 7-10 days). Transects were sometimes monitored in marginal weather, but not in extremely poor weather (rain, heavy wind, or cold temperatures). Only transect visits that had temperatures greater than or equal to 18^0 C and wind speeds less than or equal to 4.0 mph were used in the analysis.

The set transect locations and numbers of observed Mission blue butterflies in 1999 are shown in Figure 4. A tally of the Mission blue data is included in Appendix A, and Table A-1 contains a summary of Mission blue field data.

Figure 5 shows a comparison of the total Mission blue observations by monitoring date at the 14 transects monitored in 1998 and 1999. The data shows that in 1999, the Mission blue flight season peaked and ended later than 1998. (1998 was also a late year for the Mission blue due to the El Nino rains which brought over 56 inches of rainfall to San Bruno Mountain that year).

Figure 6 provides a comparison of the average Mission blue observations per monitoring visit at the 14 transects monitored in both 1998 and 1999. There was a noticeable increase in observations of Mission blues using *Lupinus formosus* (transects #1, #3, #4, and #22), while observations at *Lupinus albifrons* transects (all other transects) were mostly down. Transects 6, 12, and 28 had more observations recorded in 1999 than in 1998, and dieback of *L. albifrons* was minimal at these sites. In contrast, transects 2, 18, 25, 27, were areas that had heavy dieback of *L. albifrons*, and

Mission blue observations were either unchanged or down at these sites. Apparently, the amount of surviving *L. albifrons* has been sufficient to support at least some mission blue butterflies at all of these locations.

Status of Silver Lupine. Several patches of silver lupine, (*Lupinus albifrons*) suffered dramatic dieback after the El Nino rains of 1997-98. The cause is believed to ber an air-borne root fungus (personal communication Sue Gardner, Site Stewardship Program, NPS) . The pattern of colonies impacted is not understood at this time, however it seems likely that soil permeability is a determining factor. At Milagra Ridge, Mission blue numbers were down significantly from previous years, likely the result of the *Lupinus albifrons* dieback (personal communication Emily Newby, Site Stewardship Program, NPS). On San Bruno Mountain lupine dieback was most notable at the following areas: Pointe Pacific (Transect #28), Saddle (Transect #25), Arnold Slope (Transect #2), and Trash Terrace (Transect #10). Lupines in these areas have not returned to former densities, however, Mission blue butterflies were recorded at all of these sites in 1999. Patches of *Lupinus formosus* appear not to have been effected by the root fungus, and may have actually benefitted from the wetter winters over the past three years.

b. Callippe Silverspot Butterfly (*Speyeria callippe callippe*)

The callippe silverspot was listed as an endangered species by the U.S. Fish and Wildlife Service in December 1997. The County of San Mateo and cities of Brisbane, Daly City, and South San Francisco are in the process of seeking an amendment to Section 10(a)(1)(B) PRT-2 9818 to add the callippe to the incidental take provisions of that permit.

Methods

In 1999, wandering transects were used to assess the relative population status and distribution of the callippe silverspot on the Mountain. Wandering transects are walked by experienced field biologists and data is recorded on data logs and topography maps. The tabulated data for 1999 is contained in Appendix A, Table A-2. A butterfly sightings per hour (S/H) figure is derived by dividing the total number of hours spent on transects by the total number of butterfly observations made.

The locations of the 362 callippe adults observed in 1999 are shown in Figure 7. Note that beginning in 1999 the transect routes are shown along with the adult observations. As with the Mission blue, showing the routes provides information regarding which areas were actually surveyed and which were not.

The 362 adult callippe were observed in 23.5 hours of surveying yielding a sightings per hour (S/H) figure of 15.4 -- significantly higher than the previous years figures (see Table 2 for an annual summary of person hours, sightings, and S/H for the monitoring period 1982 to 1999).

Table 2. Callippe Monitoring on SBM: 1982 - 1999.

Year	Total Hours	Total sightings *	Sightings/ hour
1982	83.25	526	6.3
1983	37.25	114	3.1
1984	77.75	328	4.2
1985	89.0	607	6.8
1986	84.5	617	7.3
1987	76.25	943	12.4
1988	170.0	1734	10.2
1989	81.25	1349	16.6
1990	**	853	**
1991	127.5	927	7.3
1992	108.0	1358	12.6
1993	111.25	996	9.0
1994	111.75	607	5.4
1995	58.75	454	7.7
1996	31.5	296	9.4
1997	46.0	404	8.8
1998	33.0	272	8.2
1999	23.5	362	15.4

NOTES:

* The totals provided are the total butterflies observed for productive wandering transects only which is used in the level of effort calculations. This total is usually slightly lower than the total of all butterflies observed for all transects.

** The annual reports for these years do not include level of effort data.

The high 1999 S/H figure is primarily influenced by a single visit to the Southeast Ridge where 128 callippe were observed in a two hour period. Good numbers of callippe were also observed on the Southeast Ridge above Brisbane, in Owl and Buckeye Canyons, and on the small ridge under the transmission lines next to the Linda Vista development. The relative population size graph for 1999 is depicted in Figure 8.

There were few callippe observed on the northeast ridge in 1999. Historically the northeast ridge has received the most thorough monitoring due to its easy access. However this year, the southeast ridge area was covered more thoroughly (Figure 9), while the northeast ridge received only one 2.25 hour visit. The low numbers of callippe

for the Northeast Ridge in 1999 is likely the result of monitors missing the beginning of what proved to be a short flight season. The callippe flight season started very late in 1999, with one initial observation made on June 3, 1999; the callippe was not recorded again until June 22. The flight season was relatively short with the peak occurring in early July.

c. San Bruno Elfin (*Incisalia mossii bayensis*)

For the San Bruno elfin butterfly, 20 survey points were monitored for adults and/or larvae on San Bruno Mountain in 1999. These points were installed in 1998 (refer to 1998 Annual Report for details on point methodology). A total of 28 adult San Bruno elfin butterflies were observed in 1999 (these are shown in Figure 10). This is a significant reduction from the 103 adults observed during the previous year. Even though surveys began in early March, the earliest adults were not observed until March 28. This is a full month later than the previous year in which the first adults were spotted on February 28. The last observation of San Bruno elfin adults for the 1999 monitoring season occurred on April 14, however it is likely the flight season extended beyond this point since fresh individuals were seen on that day.

Figure 11 shows the average number of elfin observations per visit at each of the points surveyed in both 1998 and 1999. (Points 1, 4, and 21 were not surveyed in 1999). The highest numbers were found at point 13 for both years. This point is located on the side of Radio Road, adjacent to a roadcut with abundant *Sedum spathulifolium* (larval host plant).

In 1999, standardized searches for elfin larvae were conducted from May 17 to June 1 at each elfin point. All *Sedum* plants within a 25 foot radius of the point were searched at least once during this period. A total of 410 larvae were recorded, the highest larvae total for all previous years surveyed. At one location an entire slope was searched (from point 9 to 10) and a total of 174 elfin larvae were recorded (see Figure 6). Surprisingly, only two adults were observed at these points during the adult survey period. Elfin larvae were also observed at two sub-colonies which last year were thought to be extirpated. Two larvae were found at Point 14 and two were found near Point 21 in a previously unknown location. A tally of the 1999 San Bruno elfin field data is included in Table A-3 in Appendix A.

Although the cool spring of 1999 appeared to decrease elfin adult observations, larval counts were way up. This demonstrates that the adult monitoring did not capture the flight windows of the elfin at some of the points. The elfin are perhaps the most restricted in their use of weather windows for flight and the cold spring of 1999 made it difficult for field crews to survey during appropriate flight weather. The higher larval counts suggest that the elfin can be abundant in a location where they have gone undetected during their flight season. The higher larval counts are also likely to be a function of the more standardized search methods employed in 1999. Subsequent years of standardized data collection should provide better resolution on elfin distribution and year to year fluctuations on San Bruno Mountain.

d. Bay Checkerspot Butterfly (*Euphydryas editha bayensis*)

No bay checkerspot butterflies (larvae or adults) were observed on San Bruno Mountain by field crew while conducting biological activities and overseeing development activities in 1999.

e. San Francisco Garter Snake (*Thamnophis sirtalis tetrataenia*)

No San Francisco garter snakes (SFGS) were observed on San Bruno Mountain by field crew while conducting biological activities and overseeing development activities in 1999.

f. Plants of Concern

San Bruno Mountain is home to several rare and listed plants. In 1999, rare plant work focused on the preparation of a burn plan for Kamchatka Point, where one of the San Bruno Mountain manzanita (*Arctostaphylos imbricata imbricata*) colonies had significant leaf damage and dieback from a Tussock moth infestation. A burn permit was issued in November 1999 by the Bay Area Air Quality Management District, however the onset of cool and wet weather conditions precluded the controlled burn from being set. The burn needs to be conducted in the dry season so as to stimulate proper seed germination of the San Bruno Mountain manzanita, which reproduces only by seed. An extension of the burn permit will be requested in the late Summer of 2000.

2. VEGETATION MANAGEMENT

a. 1999 Exotic Pest Plant Treatment Summary

Exotic pest plant control activities are being conducted to protect, enhance, and restore the native vegetation communities on San Bruno Mountain. Primary emphasis is placed on controlling exotic infestations that are invading or threatening to invade habitat of the three endangered butterflies.

Currently there are 35-40 exotic pest plant species that exist on San Bruno Mountain. As a rule, hand control methods are used to control low density infestations, while high density infestations are controlled using herbicides. Exotics of primary concern that receive the most control work include gorse, French broom, Portuguese broom, fennel, eucalyptus, Himalaya blackberry, cotoneaster, cape Ivy, English ivy, and iceplant.

The following plant species typically receive exotics control work on San Bruno Mountain:

Acacia sp. (Acacia)
Carduus pycnocephalus (Italian thistle)
Carpobrotus edulis (hottentot fig, iceplant)
Centranthus ruber (red valerian)
Cirsium vulgare (bull thistle)
Conium maculatum (poison hemlock)
Cortaderia jubata (pampas grass)
Cotoneaster sp. (Cotoneaster)
Cytisus striatus (Portuguese broom)
Erechtites arguta (New Zealand fireweed)
Erodium cicutarium
Eucalyptus globulus (blue gum tree)
Foeniculum vulgare (fennel)
Genista monspessulana (French broom)
Hedera helix (English Ivy)
Hirschfeldia incana (mustard)
Holcus lanatus (velvet grass)
Hypochaeris radicata
Lactuca virosa (wild lettuce)
Lactuca serriola (prickly lettuce)
Lobularia maritima (Lobularia)
Myoporum laetum (Myoporum)
Picris echioides (bristly ox-tongue)
Pinus radiata (Monterey Pine)
Pyrocantha crenato-serrata (Pyrocantha)
Rubus discolor (Himalaya blackberry)
Scabiosa atropurpurea
Delairea odorata (Cape Ivy)
Silybum marianum (milk thistle)
Ulex europaeus (gorse)

TRA maintains daily record sheets for all exotic pest plant work conducted on the Mountain. For hand control work an accounting of the number of all plants removed is recorded and for herbicide work the estimated number of acres treated is recorded. In 1999, over 8,200 pest plants were removed by hand and approximately 70 acres of pest plant infestations were treated with herbicides (see Tables B-1 and B-2 in Appendix B). This is a decrease in number of plants removed by hand from past years, but a marked increase in acres treated with herbicide. The reason for this change was the focus this past year on the major perennial weed infestations, while less attention was given to the annual weeds. Figure 12 shows a generalized view of the locations where hand and herbicide control work was conducted. Volunteers of the Friends of San Bruno Mountain and Bay Area Mountain Watch have also been active in removing exotic weeds from the Mountain.

b. Exotics Control Strategy and Future Goals

Exotic plant infestations are prioritized for control work as follows:

Priority 1: Small patches of exotics within native habitat

Priority 2: Small patches of exotics at the periphery of native habitat

Priority 3: Edges of large exotic infestations threatening native habitat

Priority 4: Large exotic infestations

As a general rule, all Priority 1 infestations are treated using hand removal techniques. Priority 2 infestations are treated using both hand and herbicide techniques, and Priority 3 and 4 infestations are treated using herbicide (in combination with mechanical clearing of vegetation in some cases).

Herbicide treatment has consisted of spraying targeted species with an herbicide solution containing either Garlon 4® or Roundup®. These herbicides are used due to their high effectiveness, low toxicity rating, and short half-life in the soil. Herbicide is applied one to two times per year in suitable weather (low wind, low humidity) for maximum plant uptake. The plants are left to decay in place, a process that takes from one to five years, depending upon the size of the plants. In sensitive areas (within 150 feet of private property) mature stands of exotic plants are removed by chainsaw or mowing, followed by seedling and stump herbicide treatment. Garlon 4® herbicide is the preferred chemical since it does not harm grasses.

In accordance with the 1996 San Bruno Mountain HCP Five Year Strategic Plan, exotic pest plant control work has expanded into different areas of the Mountain in recent years. Infestations on Callippe Hill, Radio Ridge, Buckeye Canyon, and portions of the Saddle have been targeted and brought under control. Because maintenance of all areas previously controlled will continue to be a priority, expansion of treatment into new areas is slow. High priorities for expanded exotics control work include: 1) the Southeast Ridge and South Slope areas where fennel is a continuing problem, and 2) areas on the south side of the Brisbane Industrial Park and in the Brisbane Acres where French and Portuguese broom infestations have expanded. Sources of additional funding will be sought again in 2000 to supplement the HCP budget and provide for expanded exotics control work on the Mountain. For more information, refer to the 1996 San Bruno Mountain HCP Five Year Strategic Plan, which provides a comprehensive breakdown of habitat management goals under different funding scenarios.

c. Eucalyptus Removal and Native Habitat Restoration

In 1995, 63 acres of eucalyptus trees were clear-cut on San Bruno Mountain. The 63 acres are broken up into five different restoration units (Figure 13). The restoration units are Dairy Ravine (22.4 acres), Wax Myrtle Ravine (6.4 acres), Hoffman

Street (5 acres), Colma Creek (4.8 acres), and April Brook (3.6 acres). The Botanic Garden site (4 acres) is within the Dairy Ravine unti and is being managed by the Friends of San Bruno Mountain.

The goals of the eucalyptus removal and native habitat restoration on San Bruno Mountain are 1) to provide corridors and restored grassland habitat for the three endangered butterflies on the Mountain (Mission blue, callippe silverspot, and San Bruno elfin) and 2) to restore native habitats for other native wildlife species.

Restoration Objectives

- Hand weeding and herbicide work at all restoration sites
- Stump lowering and grinding at the Colma Creek site
- Slash burning of debris at the Wax Myrtle Ravine and Dairy Ravine site
- Removal of slash debris from the Hoffman site
- Grass seeding of open areas
- Controlled field burning, grazing, and/or mowing to reduce annual weeds
- Planting of native species with emphasis upon lupines, Viola, and Sedum (and appropriate butterfly nectar plants) at suitable habitat locations

1999 Summary of Restoration work

Since the time of the initial cutting, restoration work has been done on approximately 40 acres (Dairy Ravine, Botanic Garden, April Brook, Colma Creek, Hoffman Street, and part of Wax Myrtle Ravine). The remaining 23 acres are within Wax Myrtle Ravine and the Pacific Nursery site. These sites have a low potential for butterfly habitat, and have not received restoration work based on the amount of funding needed to restore these sites.

Restoration work in 1999 focused on herbicide treatment of eucalyptus regrowth, gorse, cotoneaster, and Himalaya blackberry at the Dairy Ravine, Wax Myrtle Ravine, and Hoffman sites. Approximately 13 acres were treated with herbicide at the restoration sites in 1999.

Due to the proliferation of exotic pest plants and weedy grasses, most of the work at the restoration sites continues to be exotics control. Based on past results, where large areas had been planted and proved difficult to maintain, a strategy of creating small high quality habitat islands has been developed. Six planting islands will be planted in February 2000 (2 at the Colma Creek site, 2 in Dairy Ravine, and 2 in the Saddle).

In 1999, the Botanic Garden area was planted with several thousand plants by the Friends of San Bruno Mountain. On the 4th annual "Restoration Day", which took place on December 5, 1999, approximately 2,000 plants were planted in 3 planting island areas (wetland seep, grassland, and coastal scrub). Local schools that participated on Restoration Day and other planting days throughout the year include Lippman Middle School, Jefferson High School, El Camino High School, Cappuccino High School, Notre Dame High School, California Academy of Sciences, Panorama Elementary school, Brisbane Elementary school, and local scout groups (pers. comm.

Kathy Manus, FSBM).

Patrick MacNamara and volunteers from the Pointe Pacific Homeowners Association have been conducting exotic pest plant control for several years within and around their development. This past year, the volunteers cleared a swath of coyote brush that was threatening to overtake Mission blue habitat (adjacent to MB transect #27). The volunteers also created over 100 small disturbed areas within the cleared area, in which they planted *Lupinus albifrons*. As of January 2000, the lupines have sprouted in many of these disturbed areas. This technique, and others like the planting island approach developed by the Friends of San Bruno Mountain, are ways that volunteer efforts are providing new methods for restoring native butterfly habitat on San Bruno Mountain.

d. Special Exotics Control Projects

Special exotics control projects in 1999 included the Daly City/North Saddle Gorse project, the Brisbane Transmission Line Ridge Broom project and the Botanic Garden Weeding project. See Table B-4 in Appendix B. These projects are an important component in the overall weed control program on the Mountain. Exotic pest plant infestations located on lands adjacent to conserved habitat provide a constant source of seed that spreads back into and compounds control efforts within the HCP conserved habitat lands.

In 1999, gorse removal was conducted for the third year in a row on the northern slopes of the Saddle as part of the Daly City/ SBM Park boundary gorse project. Approximately 1.75 acres of dense gorse was cleared by chainsaw work and by mechanical brush cutter. This device (a Rayco T175 brushcutter) was used to cut and mulch gorse on slopes < 20°, and proved to be very effective at removing mature gorse infestations. Gorse on slopes steeper than 20° were cut by hand crews and later mulched. This project was not funded for the 1999-2000 habitat management contract year, and San Mateo County is looking into alternative funding sources to conduct the needed follow up work.

Also in 1999, approximately 4 acres of French broom were sprayed on the ridgeline and adjacent swale area near Buckeye Canyon (Transmission Line Broom Project/ Brisbane). This area which had become overgrown with French broom, has been treated for three successive years, and most of the French broom is dead and decaying. Follow up herbicide control work and clearing (burning, mowing, or other methods) will be necessary to restore this area to butterfly habitat.

Due to a proliferation of annual herbaceous weeds and grasses (primarily Italian wild rye) the Friends of San Bruno Mountain have requested herbicide applications to control weeds in the Botanic Garden. In 1999, TRA sprayed approximately 2 acres of exotic grasses within the Garden to prepare and protect planting areas from weed infestations.

e. Pilot Grazing Experiment and Conservation Grazing Plan

To date, the primary tools used in managing the ecological plant communities of San Bruno Mountain State and County Park have been herbicide or hand labor. These methods have been effective at controlling the spread and/or reducing the amount of exotic species such as gorse, French broom, eucalyptus, pampas grass, Portuguese broom, and others. These highly invasive species have been seen as the greatest threat to the native plant communities and endangered species on the Mountain. As a result, control efforts have focused on these species since the inception of the HCP in 1983.

However, other types of vegetative changes have occurred on the Mountain and are likely impacting the native plant communities and the endangered butterflies. The vegetation changes occurring on San Bruno Mountain can be broken down into 4 types:

1) Invasive of exotic perennial shrubs and trees (Gorse, French broom, eucalyptus, etc.) replacing grassland and coastal scrub;

2) Expansion of native coastal scrub replacing mixed native/non-native grassland;

3) Invasive of European grasses and forbs replacing native grassland;

4) Senescence of coastal scrub vegetation (*Ceanothus* and *Arctostaphylos* of primary concern).

Through comparison of historical and recent aerial photography of the Mountain, it is clear that coastal scrub has expanded and overtaken hundreds of acres of grassland habitat, especially on the north-facing slopes of San Bruno Mountain. This has occurred over the past 30 years since the removal of cattle grazing. It follows that a more comprehensive vegetation management program that incorporates the additional tools of grazing and fire needs to be investigated. For the 1999-2000 fiscal year, funding was allocated for the development of a conservation grazing plan and pilot grazing experiment. The plan is currently being written by David Amme, a conservation grazing specialist, and a grazing experiment is planned for the spring or fall of 2000. Exact timing, livestock, herd size, and duration of the grazing experiment will depend upon the vegetative characteristics of the area chosen and the management goals for that area.

3. DEVELOPMENT ACTIVITIES

Incidental take of habitat for the Mission blue butterfly on San Bruno Mountain was authorized under the Endangered Species Act Section 10(a)(1)(B) Permit PRT 2-9818. Figure 14 shows the land status of parcels as of December 1999. Development related activity which may have resulted in take of the Mission blue butterfly occurred during grading for the Brisbane Technology Park project and for the Bay Vista project. No take of the callippe silverspot occurred as each development site was carefully

assessed for the presence of *Viola pedunculata* during its peak bloom period, and no plants were found on either site.

The County of San Mateo and cities of Brisbane, Daly City, and South San Francisco submitted an application to the U.S. Fish and Wildlife Service seeking to amend Section 10(a)(1)(B) Permit PRT 2-9818 to include incidental take of the callippe silverspot butterfly. A decision on the application is pending.

The following is the status of the major development projects on the Mountain:

- The Northeast Ridge project (A.P. 1-07) continued home building in the Phase 1 area and many of the completed homes have become occupied.

- The Terrabay project site (2-04) continued home construction and new residents have moved in. A EIR for Phases 2 and 3 of the project was certified and there was approval of the Woods East and Woods West development sites in the Phase 2 area.

- The final home construction phase of the Golden Hills at Bay Ridge (1-01) in Daly City was completed.

- The Brisbane Technology Park (1-06) project received all approvals and began grading and construction.

- The Bay Vista project (1-03) in Daly City received all approvals and began grading.

The 2000 San Bruno Mountain HCP Operating Program is included as Appendix C to this report.

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Special thanks for their help and cooperation to:

Mission Blue butterfly monitoring volunteers:
San Mateo County Parks and Recreation Division
Lynn Fritz
Ron Weaver

The Friends of San Bruno Mountain
Louis and Kathy Manus
Doug Allshouse
Herb Brandt, and all the volunteers

City of South San Francisco Public Works Department
City of Brisbane Public Works Department
San Mateo County Department of Public Works

APPENDIX A
1999 BUTTERFLY FIELD DATA SUMMARY

MISSION BLUE BUTTERFLY
FIELD DATA SUMMARY --1999
ALL AREAS

DATE	LOCATION	ELAPSED TIME	NUMBER OBSERVED	WEATHER CONDITIONS
4/24	NER	3.0	7	Temp: 20-22 C Wind: Light 1-4 mph
4/26	West Peak	1.0	6	Temp: 21.1 C Wind: 1.6 mph average
4/30	Above Terrabay	1.75	10	Temp: ? Wind: moderate
5/5	South Slope	3.50	13	Temp: 20 C Wind: 2.1 ave.
5/5	Above Terrabay	2.5	16	Temp: 20-25 C Wind: calm
5/9	Owl/Buckeye	3.0	3	Temp: 20.4 C Wind: 4.6 ave.
5/11	South Slope	1.5	5	Temp: 19.6 C Wind: 2.0 ave.
5/13	SER, above Bayshore	1.0	5	Temp: 20.9 C Wind: to 5.0 ave.
5/14	GH - Water Tank	0.5	7	Temp: 18 C Wind: 12 mph ave.
5/17	SE Ridge	1.0	8	Temp: 22.2 C Wind: 2.5 ave.
5/17	SE Ridge	3.5	5	Temp: 22.4 C Wind: 2.2 ave
5/19	South Slope	0.75	2	Temp: 17.6 C Wind: 1.4 mph average
5/21	SE Ridge	3.0	9	Temp: 19.8 C Wind: 5.1 ave.
5/21	South Slope	2.25	4	Temp: 26 C Wind: to 5.0 ave.
5/22	Juncus Ravine	4.0	11	Temp: 21 to 29 C Wind: 3-9 ave.
5/22	Tank and Juncus	2.0	7	Temp: 26.3 C Wind: 3.2 ave
5/25	Saddle at Carter St.	1.0	4	Temp: 22.7 C Wind: 4.3 ave.
5/26	Radio Ridge	1.25	6	Temp: 22.1 C Wind: 1.6 ave.

DATE	LOCATION	ELAPSED TIME	NUMBER OBSERVED	WEATHER CONDITIONS
6/3	Buckeye Canyon	1.0	12	Temp: 25.2 C Wind: 0.3 ave.
6/5	Rio Verde	0.75	4	Temp: 18.3 C Wind: 3.3 ave.
6/9	Above Colma	2.0	2	Temp: 19 C Wind: 4.5 ave
6/10	Northeast Ridge	0.25	5	Temp: 70's F Wind: calm
6/23	Buckeye Canyon	0.5	5	Temp: 30.1 C Wind: 1.2 ave.
6/23	Colma Creek	0.5	5	Temp: 20.8 C STOPPED HERE Wind: 2.0 ave.
TOTAL	ALL AREAS	39.5000	148	3.7 = Sightings Per Hour

1999 BUTTERFLY FIELD DATA SUMMARY
SET TRANSECT SUMMARY
MISSION BLUE BUTTERFLY

Transect Number	Transect Attempts and Sightings	Incidental Sightings	Total Mission Blue Sightings	Location
1	0,0,1,0,1,1	2	5	Northeast Ridge
2	0,2,1,0,1,2,0,0	1,2,2	11	Northeast Ridge
3	0,0,3,3,2,2,0	6	16	Brisbane Office Park
4	0,1,0,0,0	1	2	Butler Paper
6	0,0,2,0,1,2,1,0		6	Owl Canyon
12	0,0,0,0,0,0,0,1	1	2	Above Goat Farm, Terrabay
13	1,0,1,0,1,1,0,0		4	Above Goat Farm, Terrabay
18	2,2,0,0	1,1	6	Nike Road
22	0,2,2,1,7,2	1,1	16	Brisbane Water Tank
23	0,0,0,0,2,1,0		3	Brisbane Water Tank
25	0,0,2,1		3	East Saddle Above Carter Street
26	0,0,0,1,1,0,0	3	5	Pointe Pacific Lower
27	0,0,1,1,1		3	Pointe Pacific Upper
28	1,0,1,0,2,3,1,0,0, 0	1	9	Wax Myrtle Ravine
TOTAL	68	23	91	

CALLIPPE SILVERSPOT BUTTERFLY
FIELD DATA SUMMARY -- 1999
ALL AREAS

DATE	LOCATION	ELAPSED TIME	NUMBER OBSERVED	WEATHER CONDITIONS
6/28	Northeast Ridge	2.25	22	Temp: 31.0 Wind: 3.1 ave.
6/28	Rio Verde under Transmission Lines	0.5	21	Temp: 31.0 Wind: 3.1 ave.
6/29	GH - Brisbane Office Park	.5	2	Temp: 29.4 Wind: 2.0 ave.
6/29	GH - Brisbane Water Tank	.5	1	Temp: 26.4 Wind: 6.6 ave.
6/29	Saddle	.75	2	Temp: 29.4 Wind: 2.0 ave.
6/30	SE Ridge - Owl/Buckeye	2.75	50	Temp: 31.8 Wind: 5.1 ave.
7/1	SE Ridge - Main Ridge	2.0	128	Temp: 22.7 Wind: 4.8 to 18.0 ave.
7/7	SE Ridge - Main Ridge	2.75	56	Temp: 25.2 Wind: 0.7 ave.
7/10	Ridge North of Quarry	2.0	10	Temp: 32.0 Wind: 2.1 ave.
7/10	Ridge South of Quarry	2.0	21	Temp: 33.0 Wind: 1.0 ave.
7/10	Watson Property	.50	3	Temp: 27.0 Wind: 1.0 ave.
7/11	SE Ridge - above Bayshore	3.00	10	Temp: 28.0 Wind: 2.6 ave.
7/15	SE Ridge - Main Ridge	2.0	28	Temp: sunny/hot Wind: 3 mph
7/22	Owl/Buckeye	2.0	8	Temp: 28.0 Wind: 5.6 ave.
TOTAL	ALL AREAS	23.500	362	= 15.4 Sightings Per Hour

1999 SAN BRUNO ELFIN SEASON SUMMARY

ADULTS

3/01	00, Kobernus, Dairy Ravine Trail (#15, 16, 17), light wind, ~18 degrees C. (Low 60s F)
3/02	00, Kreis, Dairy Ravine Trail (#15). Weather ??
3/05	00, Harris, summit (#12), Wax Myrtle (#17), Dairy Ravine (#16), light winds, low 60's, partly cloudy
3/12	00, Harris, sunny, ~ 60, Dairy Ravine trail (#16)
3/27	00, Kreis, sunny, 17.5 C (low 60s F). wind: 1 mph. Ave. (#7)
3/28	16, Kobernus, sunny, 16-18 C.(low 60s F), (#6, 7, 8, 9, 12, 13, 14, 15, 17, 19, 20)
3/28	00, Kreis, clear, upper 50's, (#1, 2, 3, 5, 16)
3/29	00, Kobernus and Kreis, (#1, 2, 5, 17, 19), low 60s, 2-8 mph winds
4/01	00, Harris, clear, 65, 4.4 mph, Wax Myrtle
4/02	00, Kobernus, high 60s, 2 mph ave., old Quarry above GCP
4/02	00, Kreis, high 50's, clear, (#2, 3, 5, 17)
4/13	05, Harris, Temp: high 60s to low 70s, clear, sunny, light winds (#9, 10, 12, 13, 15, 16, 17, 19, 20)
4/14	07, Kreis, 70's, clear, wind <5 mph, (#2, 3, 5, 6, 7, 9, 10, 11, 18)
4/15	00, Kreis, (#17, 20), low 60's, light winds, clear
TOTAL	28 adults observed

LARVAE

5/17	21, Harris (#12, 13, 16, 19, 20)
5/19	174, Kobernus and Kreis, (#9 and 10)
5/20	25, Harris, (#14, 17, 19, 21)
5/28	83, Kreis, (#1, 2, 5, 6, 7, 9, 13)
6/01	107, Kreis, (#1, 2, 3, 7, 8, 9, 13)
TOTAL	410 larvae observed

Formula for Determining Relative Population Size

The productivity ratio, the ratio of sightings to hours spent, is the measure of density. Density is expressed as sightings/hour (S/H). The productivity ratio is directly proportional to density, related by a constant. The Area (A) of grassland in the colony is the measure of the total resource in a colony. The product of density (sightings/hour) times Area yields a measure of the insects present. The actual value of the product has no direct meaning -- it is related to the true number of insects by an unspecified constant. However, if the product for the various colonies is summed and the product for one colony is expressed as a percentage of the total, then the unspecified constant cancels out. The result is a valid estimate of the proportion of all insects in the colony.

For the Mission blue, the productivity ratio formula was applied to the 1999 butterfly counts for the following regional categories. All conserved habitat is included within these regional categories.

Colony	**Sightings per Hour**	**Area*** (hectares)	**A x S/H**	**% of Population**
Guadalupe Hills	5.10	149	760.0	27%
Southeast Ridge	3.70	460	1702.0	60%
Radio Ridge	3.30	44	145.0	5%
Saddle	6.00	39	234.0	8%

For the callippe, the productivity ratio formula was applied to the 1999 butterfly counts for the following regional categories. All conserved habitat is included within these regional categories.

Colony	**Sightings per Hour**	**Area*** (hectares)	**A x S/H**	**% of Population**
Guadalupe Hills	10.67	149	1589.8	17.3%
Southeast Ridge	16.53	460	7603.8	82.7%

- Note that the Area figure has been adjusted in 1999 to reflect grassland loss due to development. The following adjustments have been made: GH minus 58 hectares; SR minus 40 hectares; RR minus 2 hectares; and Saddle minus 9 hectares.

APPENDIX B — EXOTIC PEST PLANTS REMOVED BY HAND AND HERBICIDE WORK ON SBM IN 1999

Table B-1. Numbers of Exotic Pest Plants Removed by Hand Work on San Bruno Mountain in 1999[1]

Area	UE	EG	GM	CS	FV	PE	Other	Total
Bay Ridge/Linda Vista	213		355		98		40	706
Ridge Trail			265		638	250		1153
Saddle			25		10			35
Devil's Arroyo				50	30			80
Callippe Hill/NER			241	10	639	147	4	1041
Buckeye Canyon			35		1048	107	43	1233
Owl/Buckeye Subridge			583		127	96		806
Brisbane Acres/above Bayshore			300		55			355
Bitter Cherry Ridge				2	50		26	78
Terrabay/ South Slope				27				27
Juncus Ravine/ Hillside					1460	140	12	1612
Tank Ravine					847	70	4	921
Guadalupe Canyon Parkway		85	36	4	40			165
Total	**213**	**85**	**1840**	**93**	**5042**	**810**	**129**	**8212**

1. Plants were removed using weed wrenches, maddox's or by hand pulling. Categories represented are: **UE**: *Ulex europaeus* (gorse), **EG**: *Eucalyptus globulus* (blue-gum tree), **GM**: *Genista monspessulana* (French broom), **CS**: *Cytissus striatus* (Portuguese broom), **FV**: *Foeniculum vulgare* (fennel), and **PE**: *Picris echiodes* (bristly ox-tongue). Other category includes additional weed species receiving hand control.

Table B-2 Acreages of exotic pest plants treated with herbicide at Saddle and Main Mountain areas in 1999.

Area	Gorse (UE)	F.Broom (GM)	P.Broom (CS)	Fennel (FV)	Comb-ined/ Other	TOTAL
Saddle- Main treatment areas	12.75	1.25				14.00
Bitter Cherry Ridge	0.50				1.50	2.00
Hill West of Quarry		2.50				2.50
Industrial Park		0.40	0.50	1.10		2.00
NE Ridge / Water Tank Area		0.75				0.75
Radio Road/Summit	0.50	0.25				0.75
Guadalupe Cyn Pkwy	1.25	0.50	0.50	1.00	3.00	6.25
Brisbane Acres		1.50	0.25	1.50		3.25
Linda Vista Area	2.25	0.50		0.25	0.50	3.50
SE Ridge/Above Bayshore		2.00		10.00	1.75	13.75
Tank Ravine				0.25		0.25
Juncus Ravine				3.25		3.25
Wax Myrtle Ravine	5.00			0.25	0.50	5.75
Dairy Ravine	3.25				3.25	6.50
Pointe Pacific					0.75	0.75
Hoffman Street		0.25		0.50	0.25	1.00
Bog Trail	0.25				0.50	0.75
Devil's Arroyo					0.25	0.25
Old Ranch Road					0.75	0.75
Olivet Ravine				0.50		0.50
Pig Ranch and Serbian Ravines					2.00	2.00
TOTAL	**25.75**	**9.90**	**1.25**	**18.60**	**15.00**	**70.50**

H=High density >50% cover, L=Low density = 0-50% cover. Density and acreages were visually estimated in field. High density infestations are typically sprayed with a spray rig, while low density infestations are typically sprayed using backpack sprayers. Categories represented are: UE: *Ulex europaeus* (gorse), EG: *Eucalyptus globulus* (blue-gum tree), GM: *Genista monspessulana* (French

broom), CS: *Cytissus striatus* (Portuguese broom), FV: *Foeniculum vulgare* (fennel). Other category includes German ivy, English ivy, cotoneaster, pampas grass, iceplant, (*Carpobrotus edulis*), and *Echium sp.*

Table B-3. Special Projects on San Bruno Mountain: Acreages of exotic pest plants treated with herbicide or cleared of exotic infestations.

Project	Spray Gorse	Spray French Broom	Spray Other	Vegetation clearing (mowing/ chainsaw)	TOTAL
Botanic Garden			1.75	0.25	2.00
Daly City/ Park boundary Gorse project	1.75				1.75
Transmission Line Ridge/Broom Project/ Brisbane		4.00			4.00
TOTAL	1.75	4.00	1.75	0.25	7.75

APPENDIX C
OPERATING PROGRAM BY ADMINISTRATIVE PARCEL -- 2000

Administrative Parcel	Species Monitoring	Exotics Control	Revegetation	Planning Assistance *
GUADALUPE HILLS (1)				
01 Linda Vista III (Bay Ridge)	X	X	X	X
02 Carter St.	X	X		
03 Rio Verde Heights	X			X
04 Levinson Property	X			
05 Brisbane Office Park	X			
06 Parcel Z	X			X
07 Northeast Ridge Project	X	X	X	X
08 Guadalupe Valley West	X	X		
09 State Park	X	X	X	X
10 Guadalupe Canyon Pkwy.	X	X		X
11 PG&E Transmission Lines	X			X
12 PG&E Fee	X			
13 Water Pipelines	X			X
14 Linda Vista I	X	X		
15 Water Tank				
16 Parcel V	X	X		
SOUTHEAST RIDGE (2)				
01 Quarry	X	X	X	X
02 Owl and Buckeye Canyons	X	X	X	
03 Brisbane Acres	X			X
04 Terrabay Project	X	X	X	X
05 County Park	X	X		X
06 Hillside School				
07 PG&E Transmission Lines	X	X		X
08 Juncus Ravine	X	X		X
09 Water Pipelines	X			x
10 Fire Breaks	X			
RADIO RIDGE (3)				
01 Telecommunications Site	X	X		X
02 County Park	X	X	X	X
03 Guadalupe Canyon Pkwy.	X	X		
04 PG&E Transmission Lines	X		X	X
SADDLE (4)				
01 Pointe Pacific	X	X		
02 Village-in-the-Park		X		
03 South Hills Estates		X		
04 State Park	X	X	X	X
05 Guadalupe Canyon Pkwy.	X	X		X
06 Water Tanks				

* Includes monitoring of construction, project design review, and HCP compliance review

Figure 1 — Mission Blue Butterfly Wandering Transects Observations — 1999

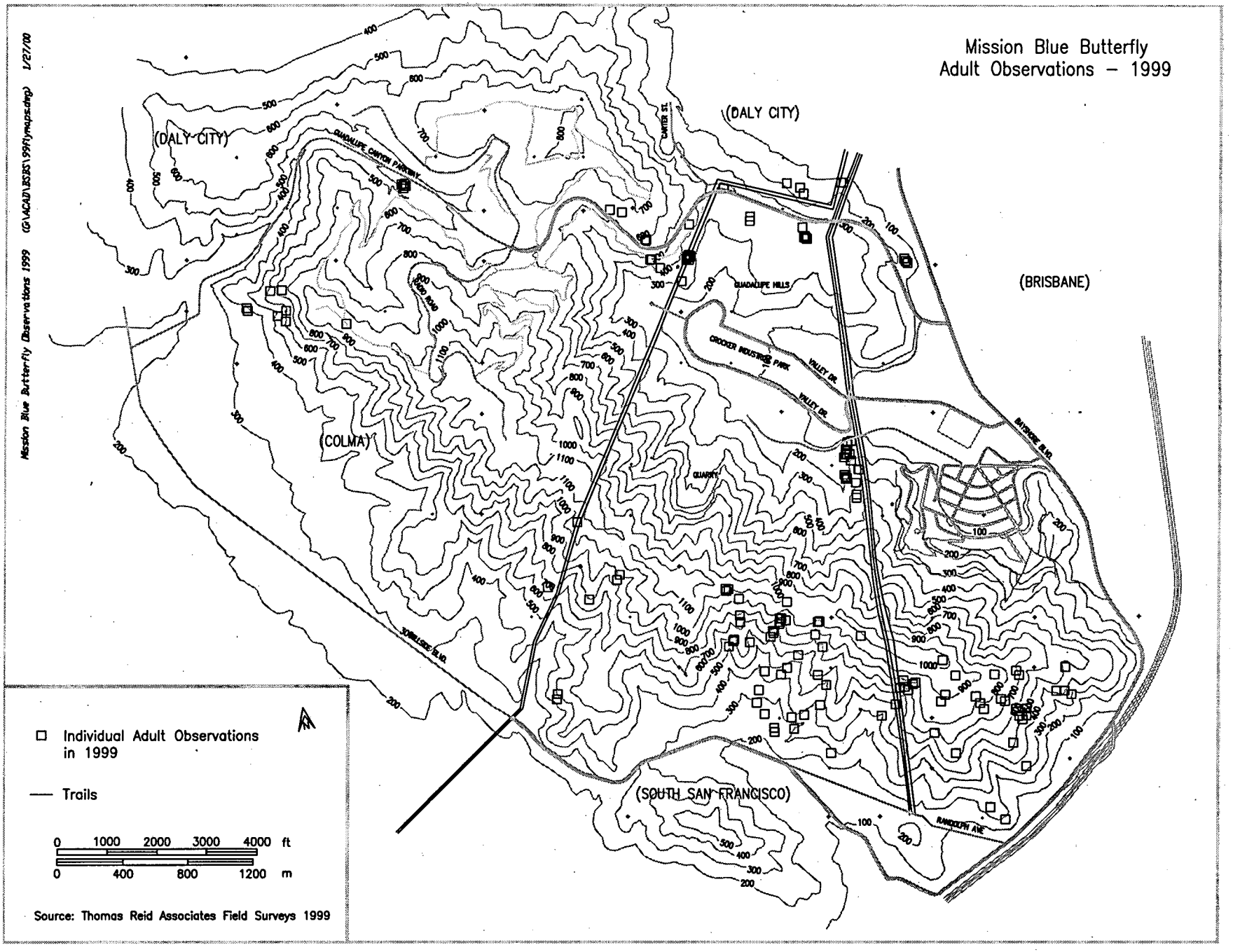
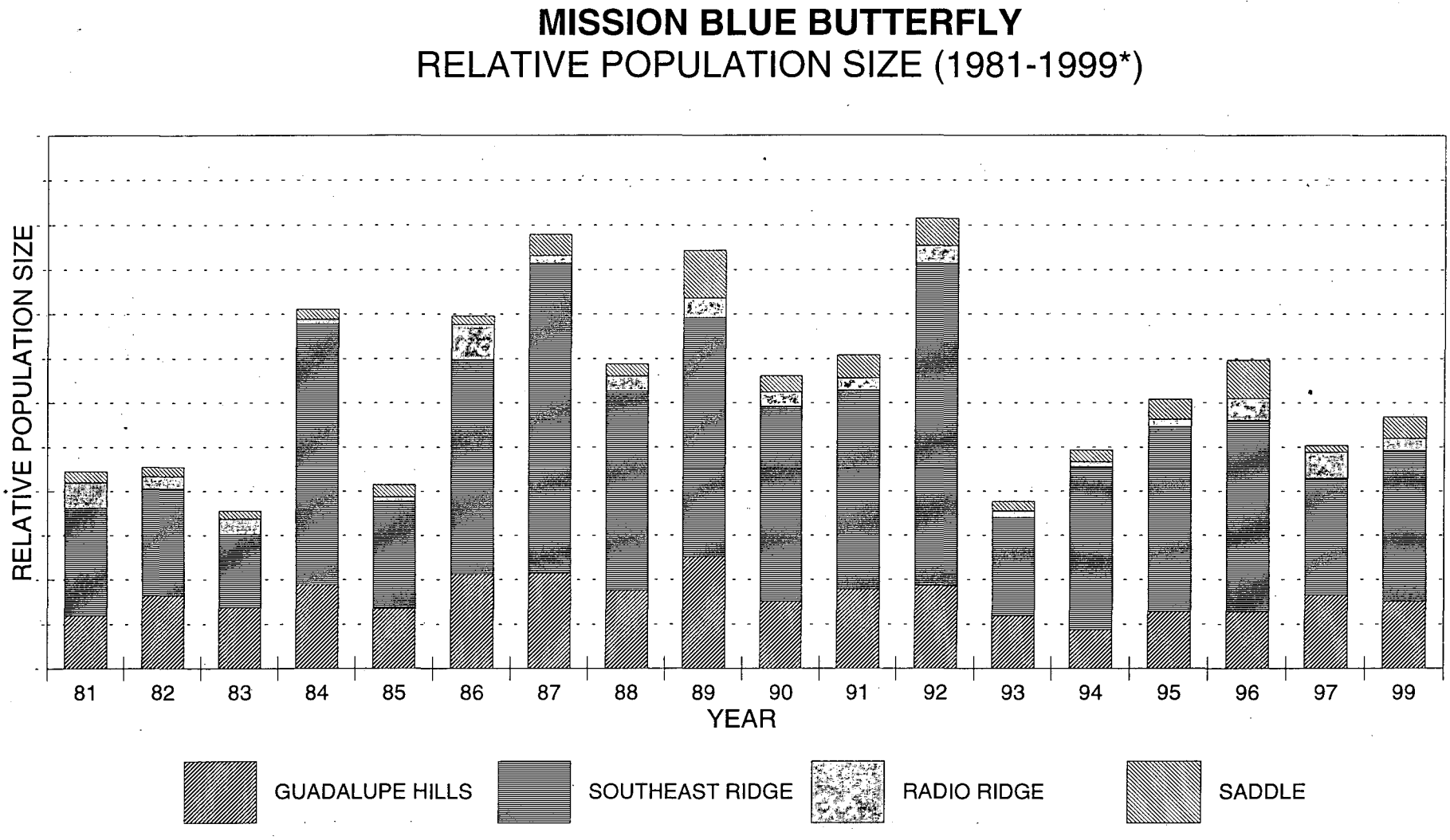


Figure 2 — Mission Blue Butterfly Relative Population Size — 1981-1999



* Note: No Wandering Data Available for 1998

Figure 3— Mission Blue Wandering Transect Routes — 1999

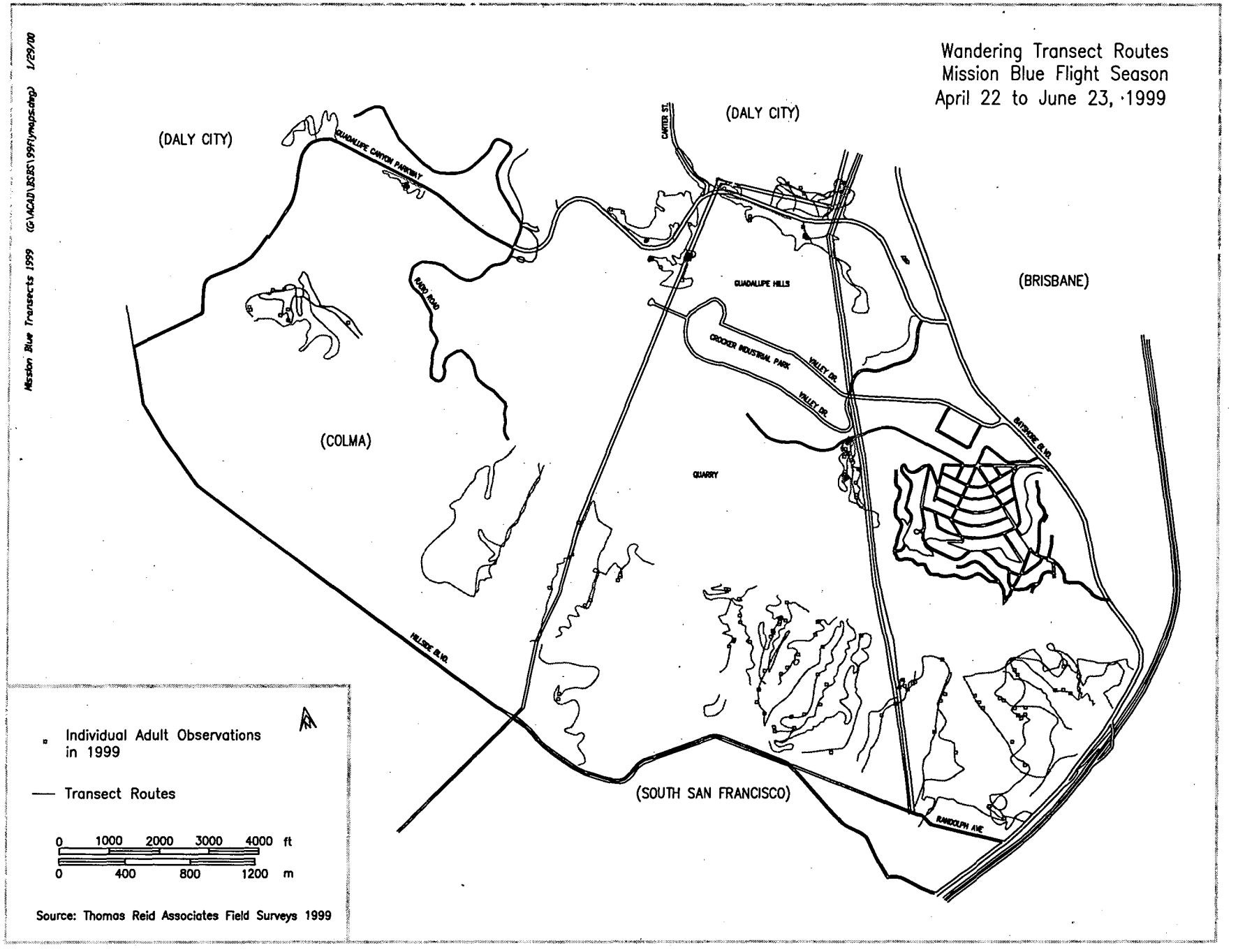
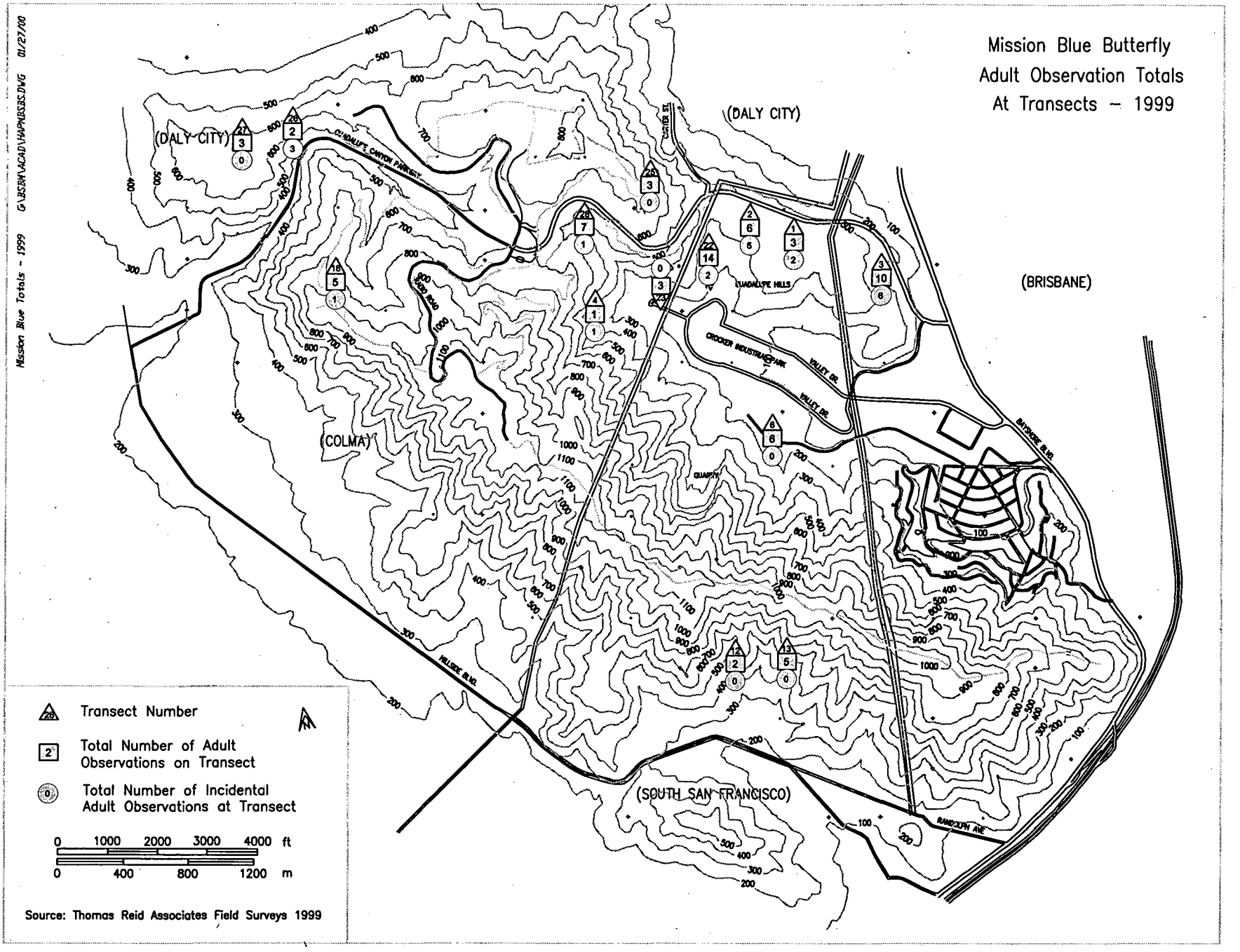
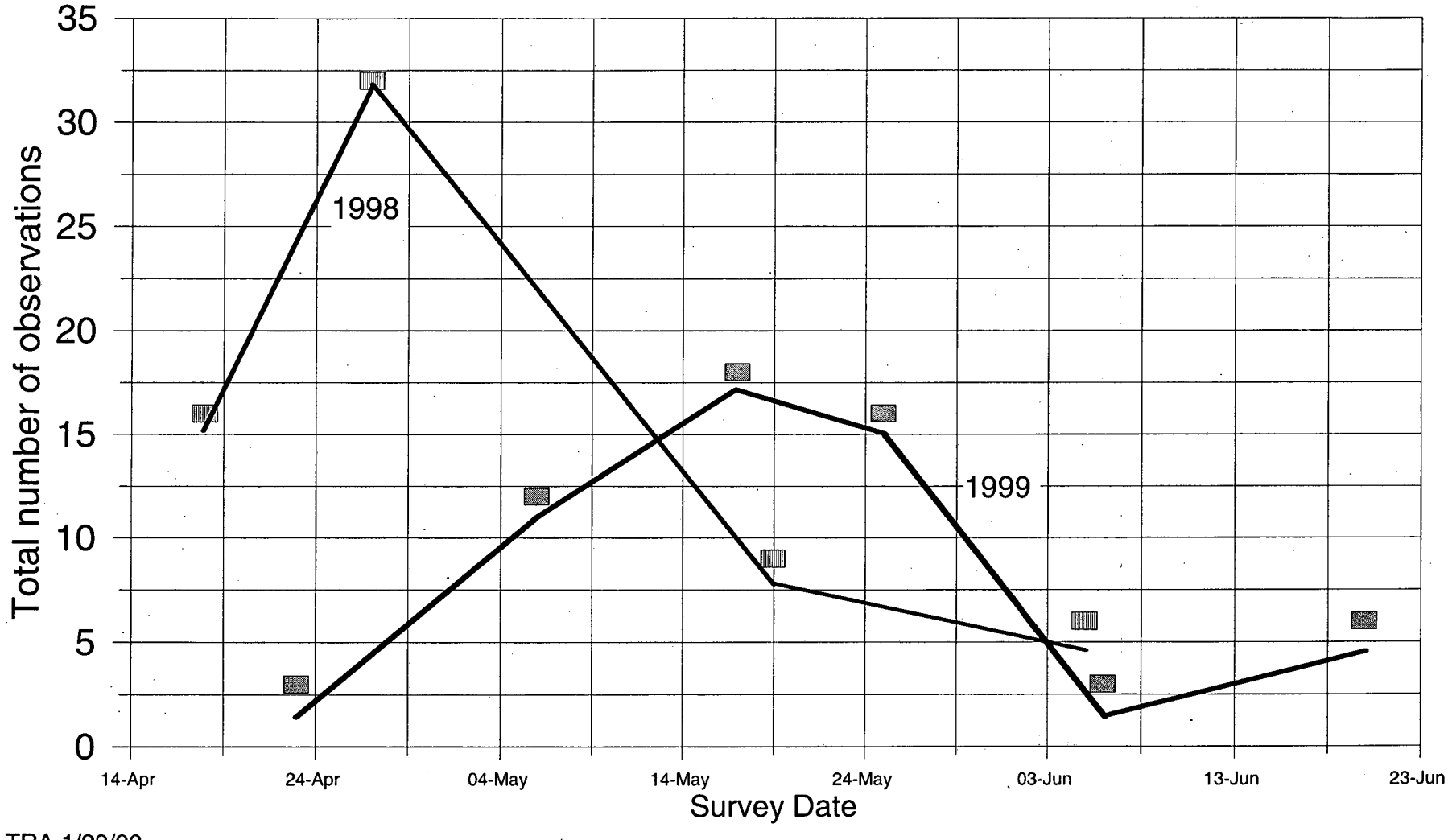


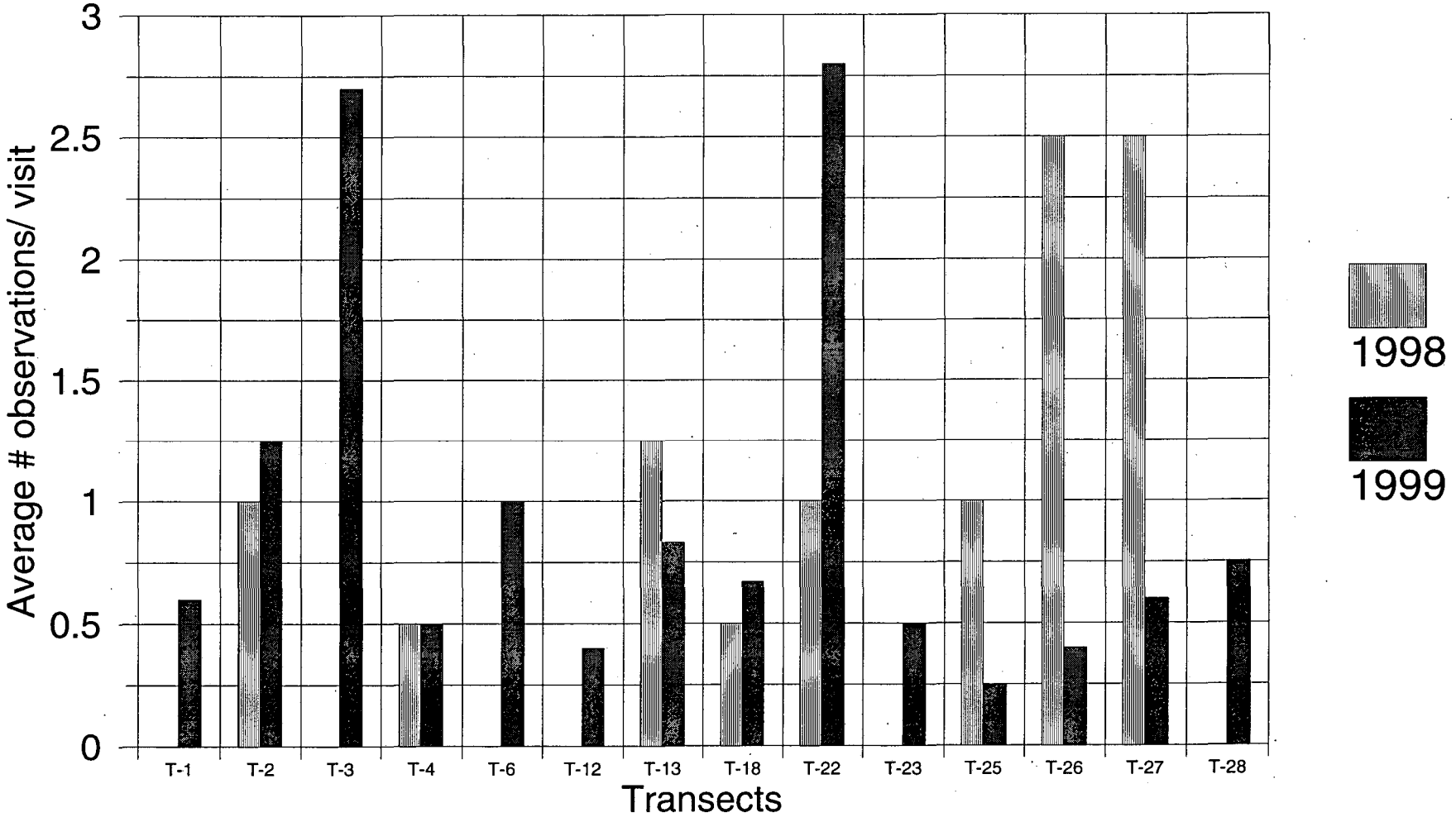
Figure 4 — Mission Blue Butterfly Set Transect Observations — 1999





TRA 1/29/00
All data used in analysis recorded during optimum weather conditions (air temp:>=18C, ave.wind<= 4.0 mph.)

Figure 5— Mission Blue Abundance at Set Transects by Date— 1998 and 1999



TRA 1/29/00
All data used in analysis recorded during optimum weather conditions (air temp:>=18C, ave.wind<= 4.0 mph.)

Figure 6— Mission Blue Abundance at Individual Set Transects— 1998 and 1999

Figure 7 — Callippe Silverspot Butterfly Wandering Transects Observations — 1999

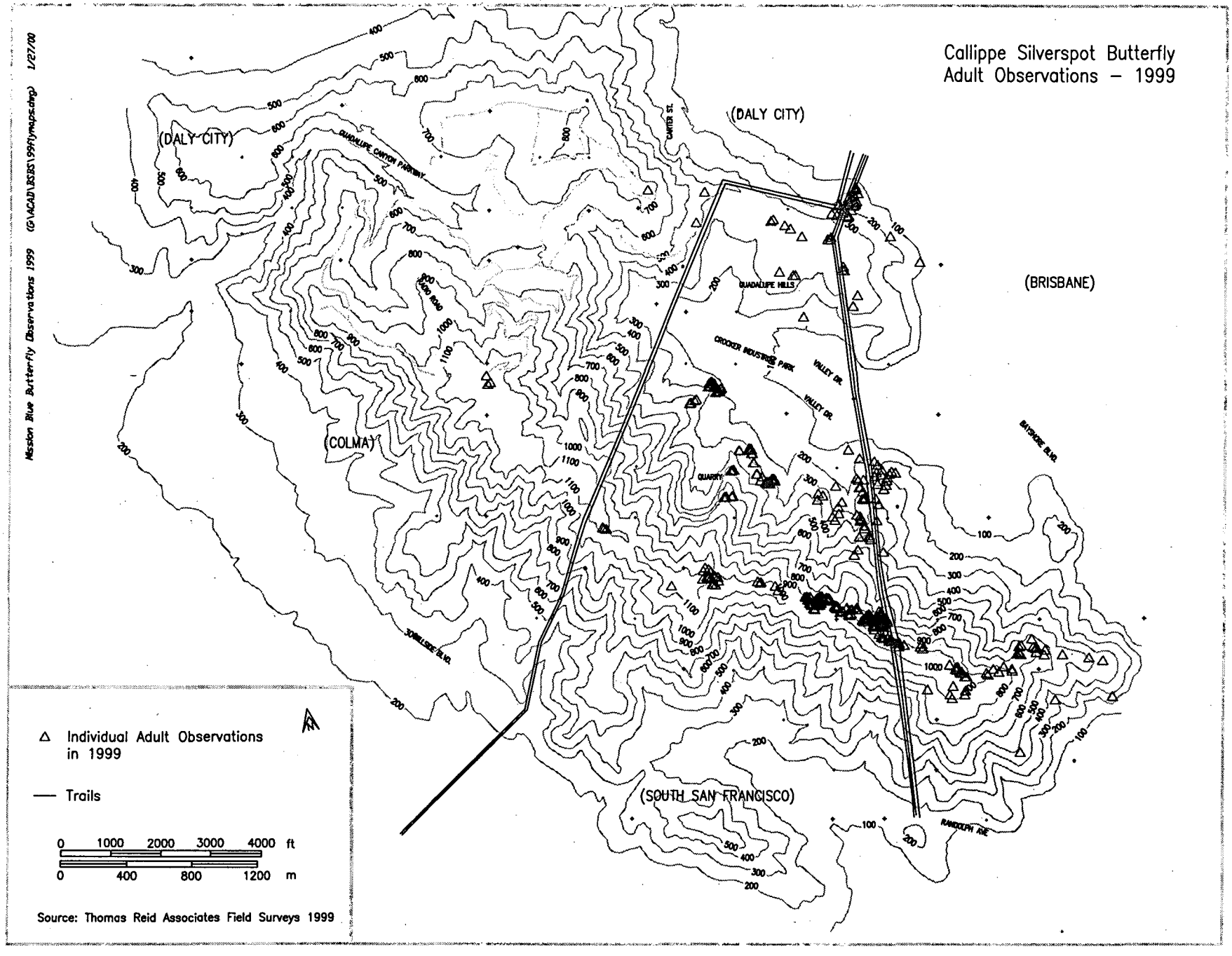


Figure 8 — Callippe Silverspot Butterfly Relative Population Size — 1981-1999

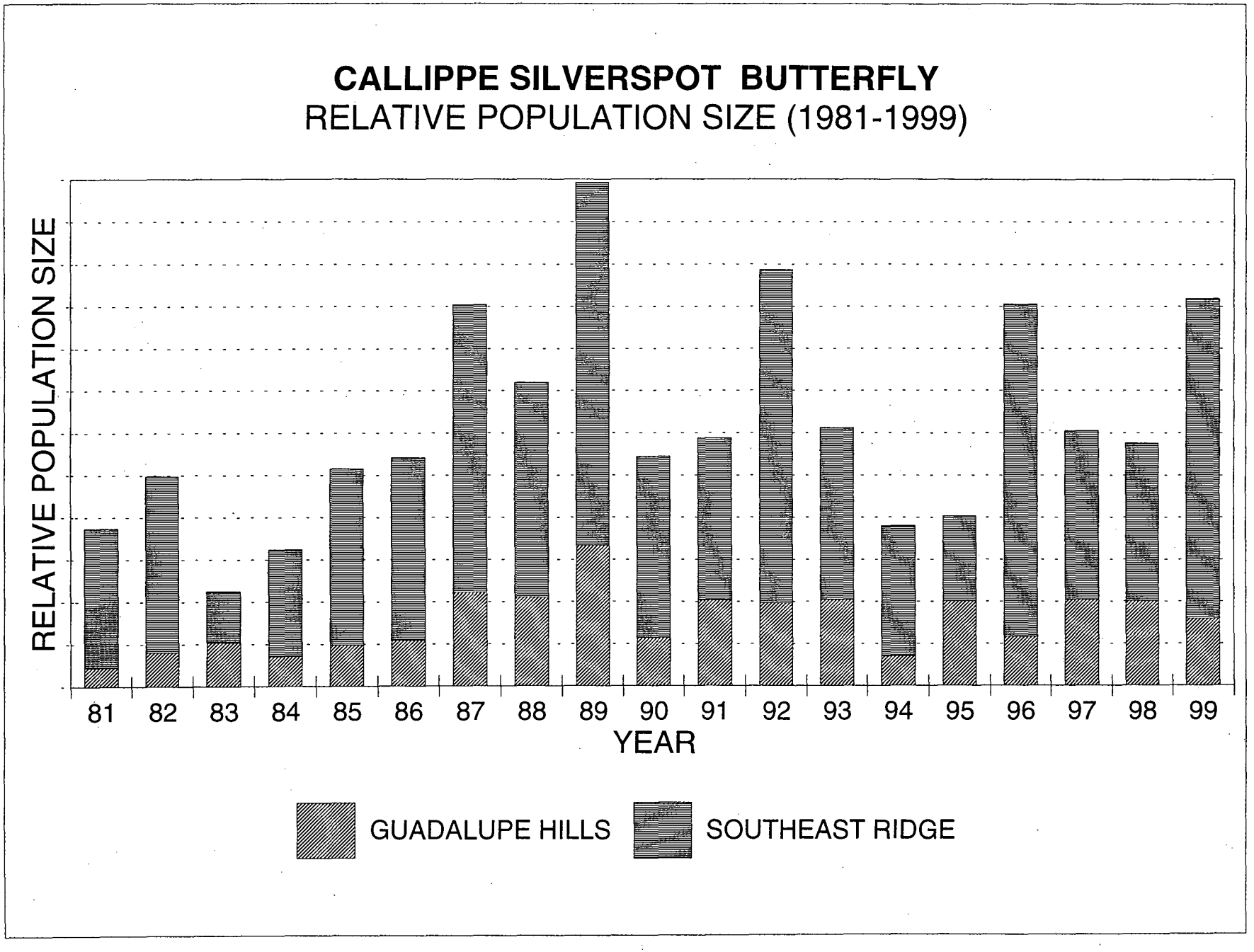


Figure 9— Callippe Silverspot Wandering Transect Routes — 1999

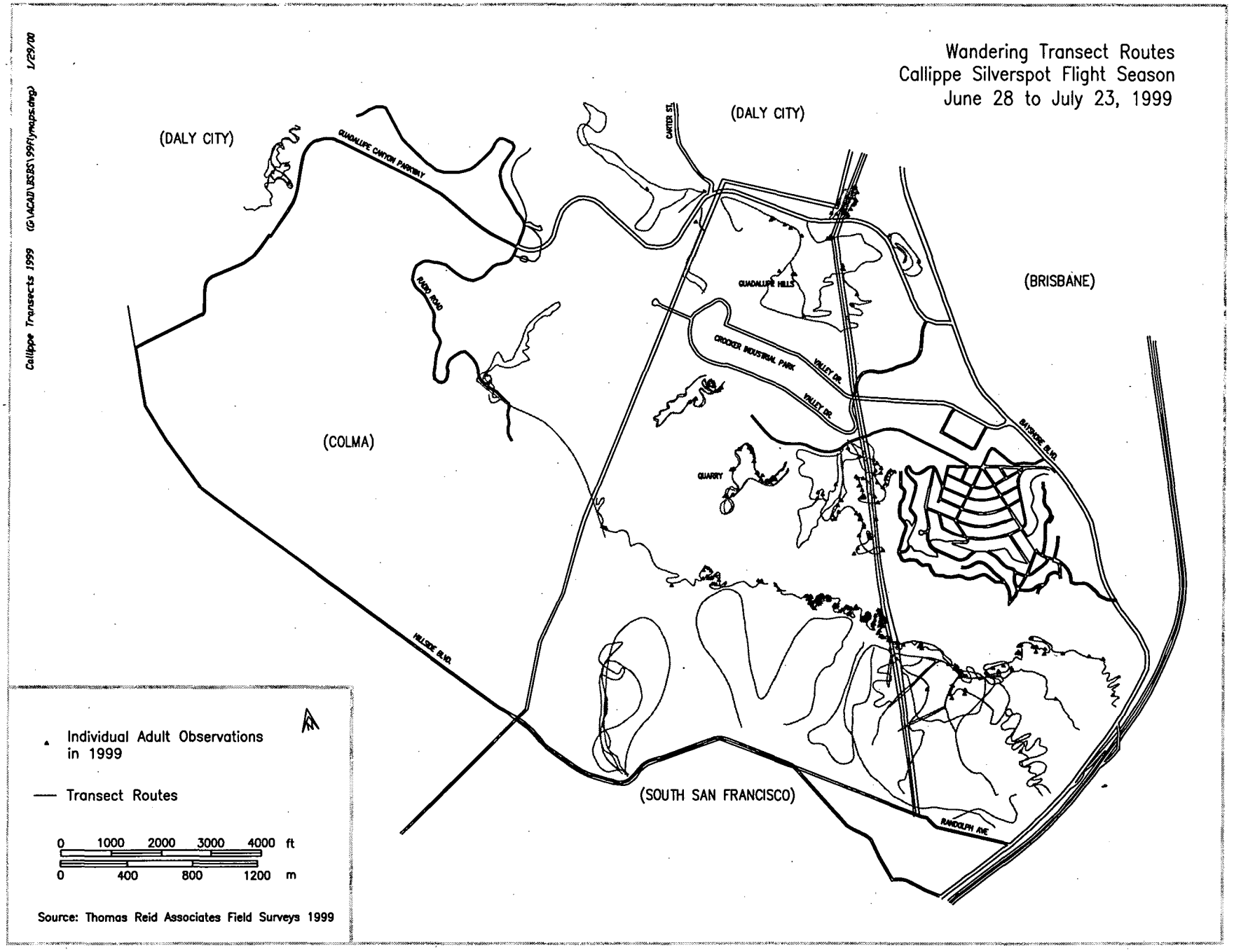


Figure 10— San Bruno Elfin Adult and Larval Observations at Points— 1999

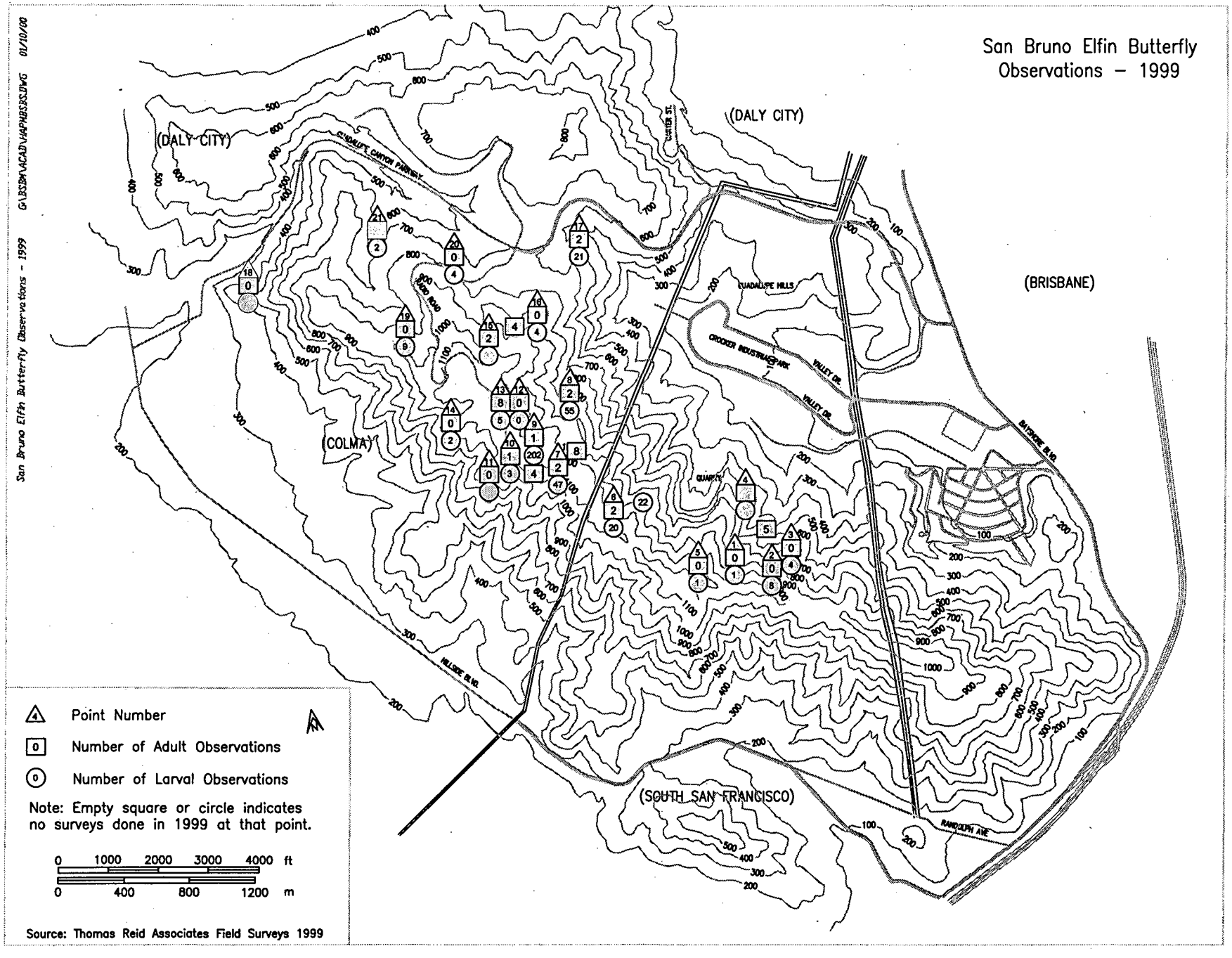
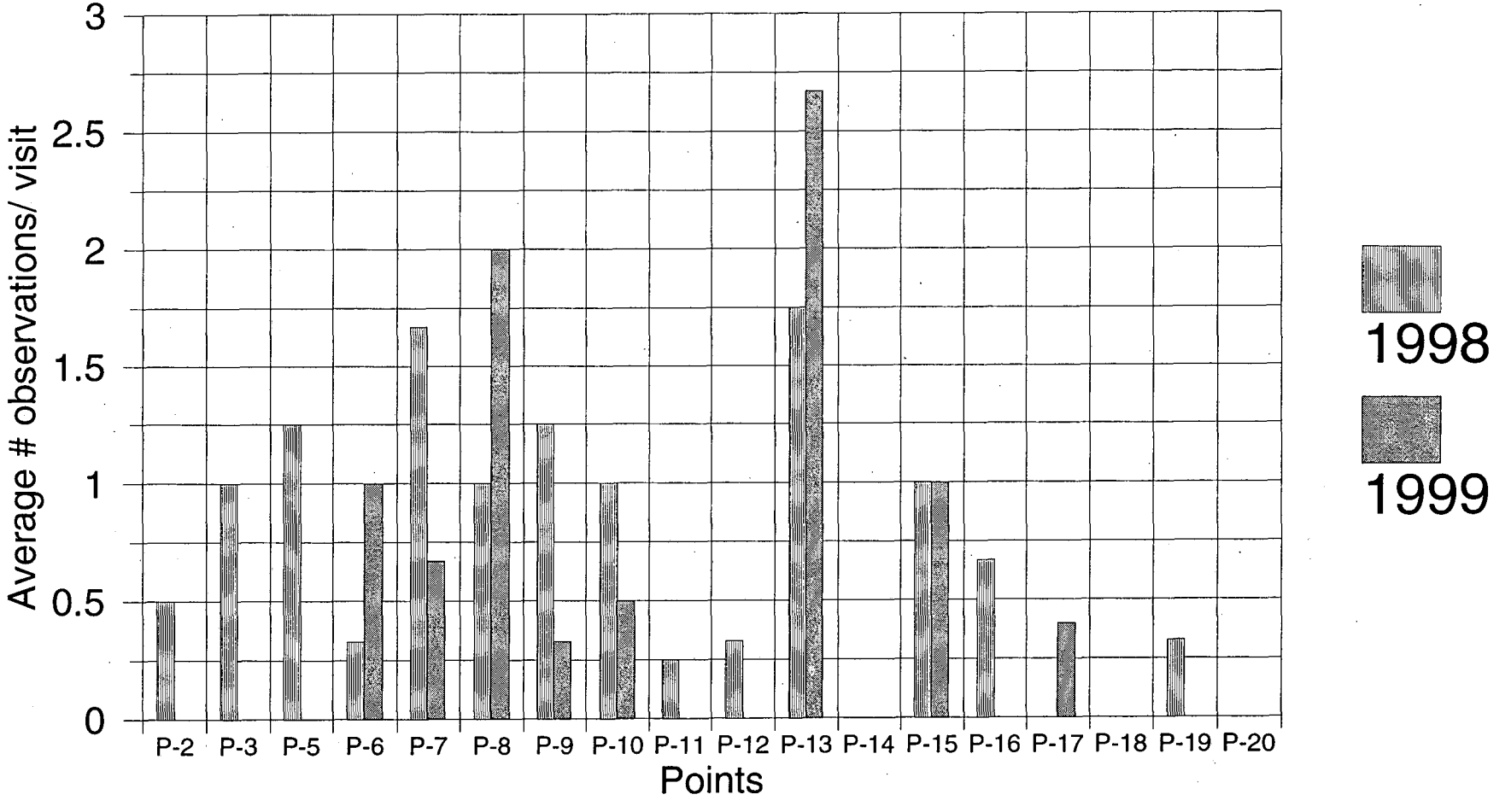


Figure 11— San Bruno Elfin Abundance at Points— 1999



TRA 1/29/00

Figure 12— Hand and Herbicide Exotics Control Work — 1999

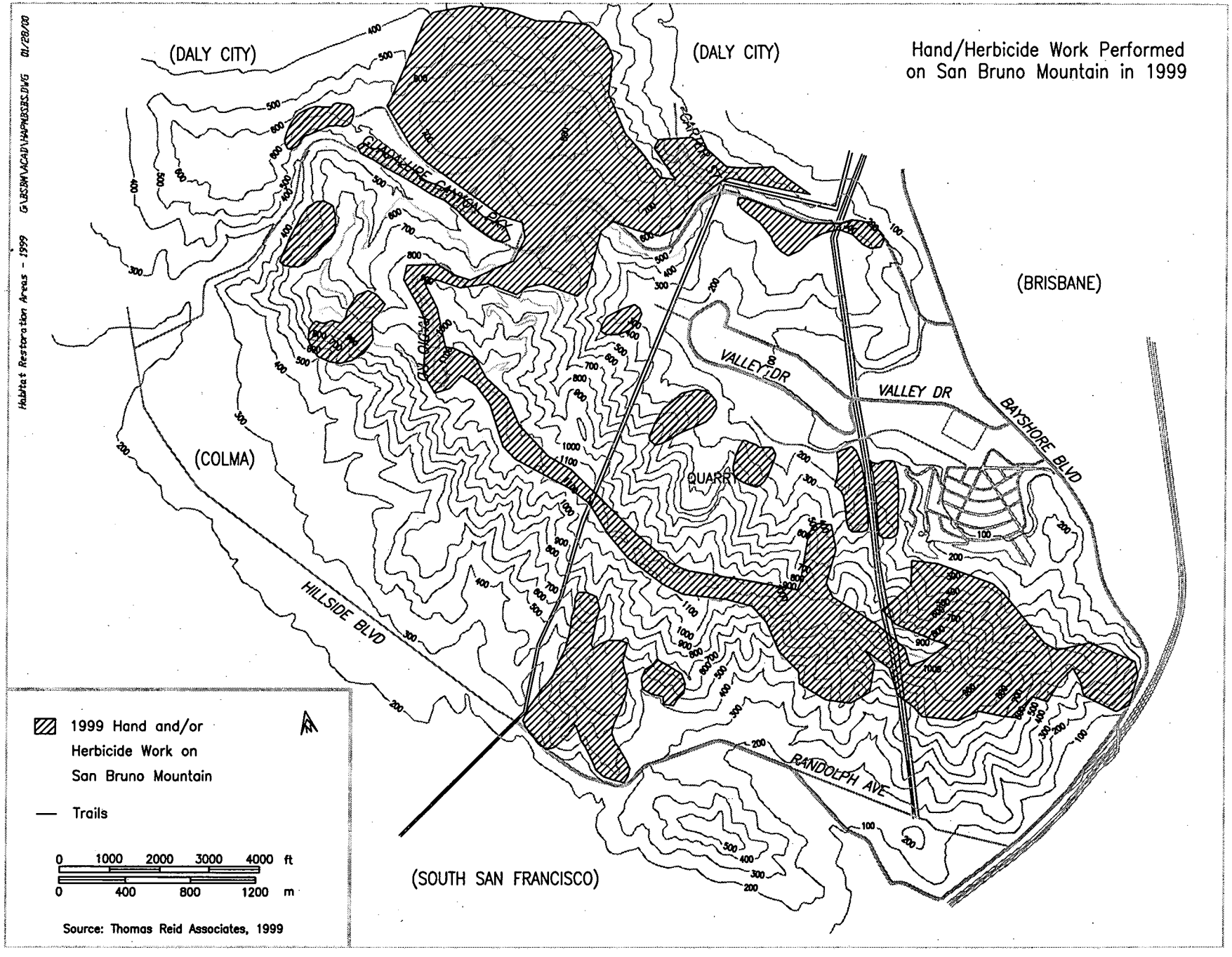


Figure 13 — Habitat Restoration in Eucalyptus cut areas on San Bruno Mountain

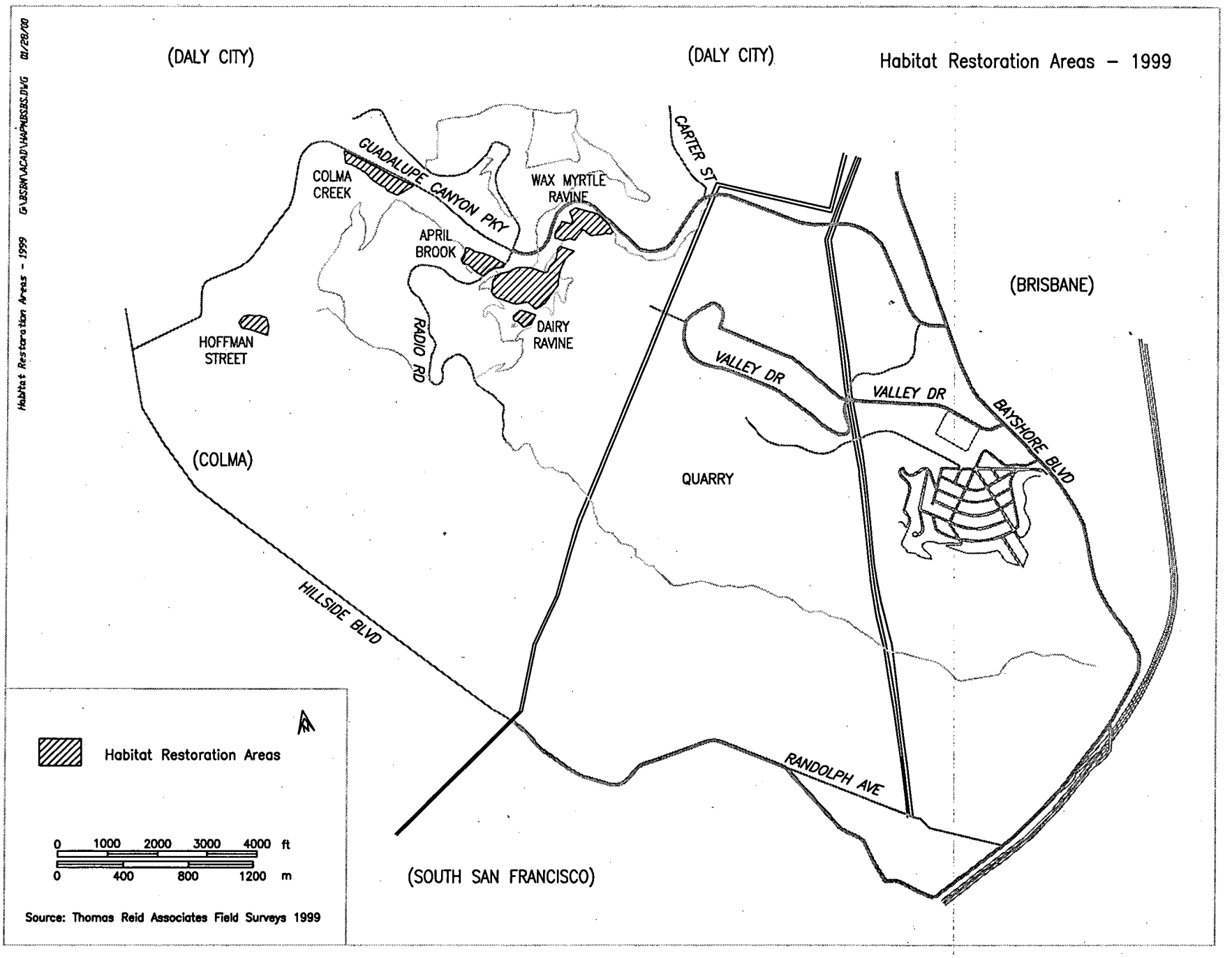
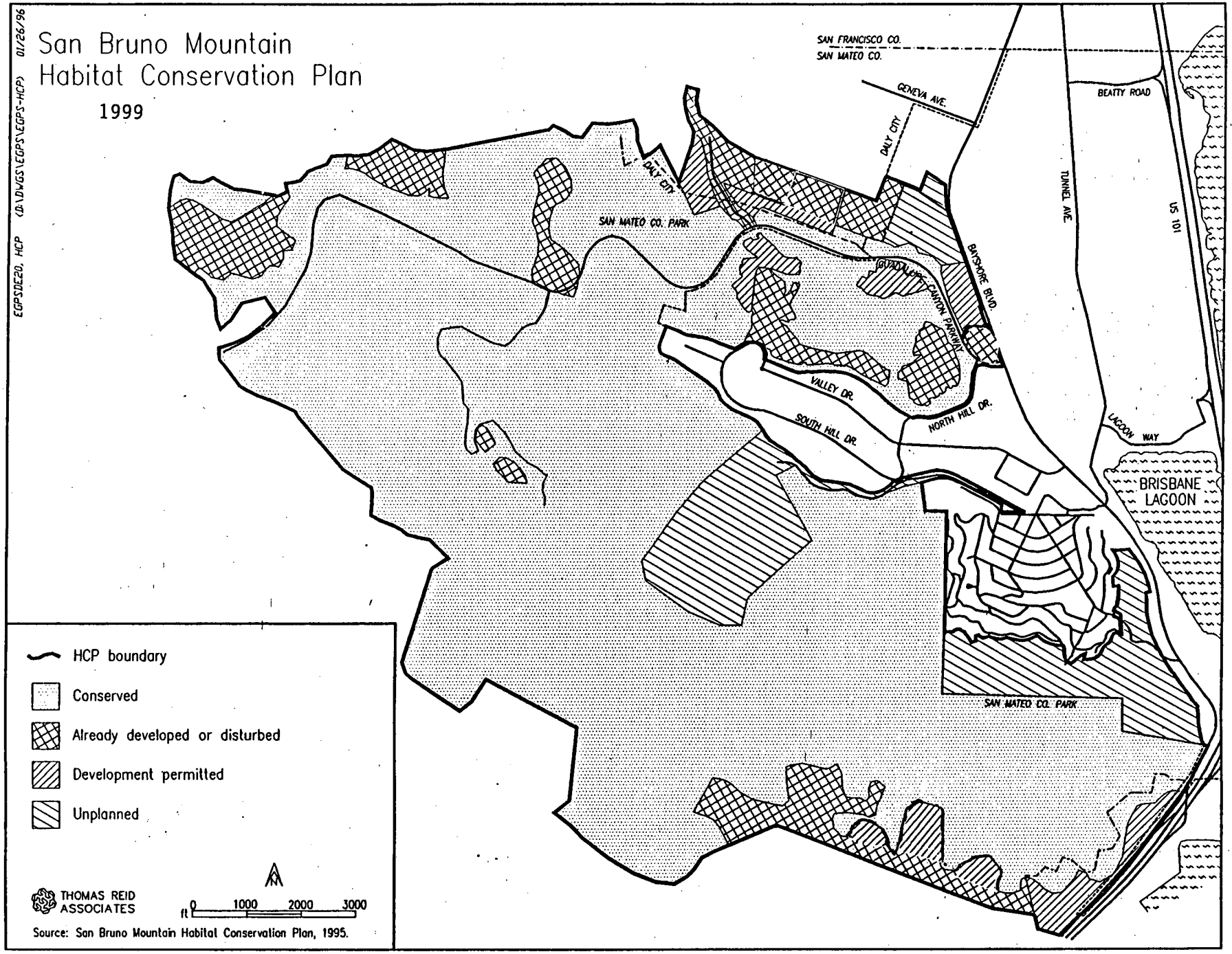


Figure 14 — Habitat Conservation Plan Parcel Status— 1999



THOMAS REID ASSOCIATES
560 WAVERLEY ST., SUITE 201 (BOX 880), PALO ALTO, CA 94301
Tel: 650-327-0429 Fax: 650-327-4024 tra@igc.org

January 28, 2000

Susan Jacobsen, Chief
Branch of Permits
Office of Management Authority
4401 North Fairfax Drive, Room 420(c)
Arlington, VA 22203

Dear Ms. Jacobsen:

Enclosed is a report of the activities conducted under Endangered Species Act Section 10(a)(1)(B) Permit #PRT 2-9818 for 1999. The permit was issued to the County of San Mateo, City of Brisbane, City of Daly City, and City of South San Francisco in 1983. Similar activities will take place in 2000 as part of the implementation of the San Bruno Mountain Habitat Conservation Plan.

Sincerely,

Victoria Harris
Senior Associate

cc: David Wright, USFWS, Sacramento
Regional Director, Ecological Services, USFWS, Portland
Roman Gankin, County of San Mateo
Tim Tune, City of Brisbane
Terry Sedik, City of Daly City
Steve Carlson, City of South San Francisco
Dee Warenycia, California Department of Fish and Game

Return-Path: <romang@pacbell.net>
Date: Wed, 23 Feb 2000 15:31:34 -0800
From: "Roman Gankin - also Jobyna K. Gankin (spouse)" <romang@pacbell.net>
Subject: Annual Report
To: Patrick kobernus <tra@igc.org>
Reply-to: romang@pacbell.net

Patrick,
Please add the following to your collection of annual report receivers and send copies:

Sally de Becker
PG&E
3400 Crow Canyon Rd
San Ramon, CA 94583

Laura Hood
Defenders of Wildlife
1101 14th Street NW, Suite 1400
Washington, DC 20005

I told you I'd find more. Actually, Sally sent me a message to get a copy, while Laura Hood (not necessarily a friend of HCP's) was interested, too, from a number of years ago.

Thanks, Roman