COMMITTEE FOR
GREEN FOOTHILLS
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August 15, 2011

Andrew Crabtree, City of San Jose

RE: Committee for Green Foothills comment letter on the Draft Program Environmental Impact Report for Envision San Jose 2040 General Plan

Dear Andrew:

The Committee for Green Foothills submits the following comments on the Draft Program Environmental Impact Report for Envision San Jose 2040 General Plan (PEIR). We again thank the City for extending the deadline for comments.

I. Feasible mitigations were omitted and must be included for Housing Imbalance, Transportation, Air Quality, Biological, and Land Use Impacts.

Impact PH -1, Impact TRANS -1, and other impacts listed below are described as significant. The mitigation we describe below will reduce that impact, although not necessarily to a level of insignificance, by delaying when it will occur and preventing unnecessary additional impacts. **Feasible mitigations not discussed in the PDEIR reduce the multiple significant impacts associated with Jobs:Employed Resident ratios exceeding 1:1**

The City worsens many of its environmental impacts, including the above impacts, through the proposed Jobs:Employed Residents ratio (J:ER) greater than 1:1, which, given the lack of housing in the Bay Area have the effect of causing large numbers of people to reside away from the Bay Area and commute by car. The City also acknowledges that it the J:ER ratios exceed 1:1 not so much because the City actually intends those high ratios but because it wants to maximize job opportunities that will increase the current ratio significantly below 1:1. See Committee for Green Foothills attached letter of February 22, 2010 for context. Mitigations that allow the flexibility of planning for jobs in multiple areas while preventing or delaying J:ER ratios far in excess of 1:1 should therefore be feasible and desireable.

1. Mitigation requiring that the J:ER jobs capacity of 1.3:1 can be planned but the actual J:ER ratio should not exceed 1:1. The PEIR should include a mitigation for Impact PH-1, Impact TRANS -1, Impact AQ- 1, Impact LU -6, and for Impacts BIO -1, BIO -4, and LU -7, all three of which should be considered significant for reasons discussed later in this letter, a requirement that the actual jobs to employed residents ratio to remain no higher than a 1:1 ratio. Development of jobs capacity in the City should happen in stages for different areas, and once the 1:1 ratio is reached, additional areas for additional capacity should not be readied for new jobs until the residential development level is also matched and planned to occur at approximately the same time. The City should include this mitigation and recalculate impacts on its basis.

2. Alternative mitigation to the strict limit of an actual J:ER ratio of 1:1, requiring the J:ER ratio remain no higher than 1:1 as long as housing is available. The City recognizes that a higher ratio of J:ER than 1:1 means there will be more people living outside San Jose and commuting to and from the City, increasing greenhouse gas emissions and creating significantly more traffic congestion. To partially mitigate the detrimental imbalance from jobs growth without housing for Impacts (ADD FROM LIST ABOVE), the growth of jobs should be bound to the growth of housing, such that the J/ER ratio does not exceeds 1:1 until the City completes their housing development goals, and then the jobs continue to be developed, possibly up to the ratio limit of 1.3:1. If the 1:1 ratio is exceeded before all the housing is completed, job capacity expansion should cease until an adequate number of housing units are developed to bring the ratio back down to 1:1.

The 1:1 ratio for the near future of J:ER can prevent a sudden influx of workers before housing is available in the city, which will mitigate the environmental impact of more employees living in surrounding regions and commuting than necessary. We understand that there needs to be a certain level of housing and job developments created for the region within San Jose, yet the ratio of jobs created does not need to be over 1:1 in order to have a fiscally successful city, especially not until housing goals are reached. The backloading mitigation policy is therefore both feasible and effective in preventing further environmental damage than the proposed developments are already causing.

II. Impacts from Prime Agricultural Land Loss

There are several flaws in the PEIR related to analysis of impacts on Prime Agricultural Land.

Failure to quantify the analysis for amount of acreage of prime farmland lost. CEQA is very clear that EIRs must be accurate, that they must not minimize project impacts, and that programmatic EIRs must not delay to project level review any impact analysis that can be conducted on the programmatic level. The PEIR here discusses the areas where prime farmland exists and would be developed, but fails to describe exactly how many acres would be lost. That figure is knowable;it is necessary to create an accurate EIR; the failure to include it minimizes the impact on agricultural land by omitting the large amount of lost farmland; and the figure can be derived now and need not wait for subsequent approvals. The City cannot adequately make a Finding of Overriding Circumstances if it fails to look adequately at the significant impacts that the General Plan would authorize.

Failure to use existing conditions as the baseline. Contrary to the statement at the beginning of PEIR Section 3 that existing conditions are used as the baseline for measuring impacts, the section on farmland references entitlements on existing farmland during the analysis of farmland impacts. It is unclear what this reference means because no quantification of farmland impacts is given, but appears to suggest that farmland with "entitled" development would not be considered part of the lost farmland. This fails to identify existing farmland condition as the baseline.

Describing "most" of North Coyote as entitled is insufficiently accurate. Much of North Coyote does not even have the pretense of entitlement, and any development in those areas would indisputably result from the PEIR.

Entitlement in North Coyote Valley is questionable for failure to meet Development Agreement benchmarks. Even if the PEIR could ignore the existing farmland condition on "entitled" land, the Development Agreement for the Coyote Valley Research Park has not been satisfied due to failure to meet benchmarks on job creation in Coyote Valley in the years since the DA had been signed. Furthermore, both the DA and subsequent permits are due to expire between now and the end of 2012. The PEIR should not plan for the next 30 years based on agreements that are either invalid or that have not been exercised and are nearly at the point of expiration.

Impact LU-6 listed on pages 176-179 has listed the loss of Prime Agricultural Land as significant and Section 3.1.4.1 on pages 193-194 has listed the loss of Prime Agricultural Land as significant and unavoidable. The feasible mitigation described below and not included in the PEIR will reduce that impact by offsetting the effects of development on agricultural lands and delaying when the impacts will occur.

There are approximately 957 acres of Prime Farmland in North Coyote Valley within the city limits and the Urban Service Area, with even more in the Coyote Valley Urban Reserve and in South Coyote Valley. Development of North Coyote Valley should be listed as a significant impact both for the impact on agricultural land and as a vital wildlife corridor. The City should not plan for any development in North Coyote Valley until the urban regions of the City have been built out. There is no reason to begin impacting this Prime Agriculture land when there is still viable space to develop and redevelop within the City. By backloading development in the city instead of undeveloped open space like Coyote Valley, this will mitigate

the effects of increased transit to Coyote Valley as well as delay environmental impacts of development in the area.

The City should mitigate any agricultural development in other areas by establishing conservation easements or other permanent protection measures for agricultural lands in a 1:1 ratio of acres developed to acres preserved. Specifically, agriculture should be protected in the Coyote Valley Urban Reserve, as well as South and North Coyote Valley once the Urban Reserve is completely protected. CEQA is clear that temporary impacts are significant, so mitigations that delay impacts and are otherwise feasible have the effect of reducing those impacts and must be implemented.

III. Other comments on Agricultural Land and mitigation

Preservation is mitigation. In light of the California Supreme Court's depublication of *Friends of the Kangaroo Rat v. California Dept. of Corrections* (2003) 111 Cal.App.4th 1400, the City should consider agricultural preservation as a feasible mitigation for the loss of agricultural land. Preservation should be at least at a one-acre-for-one-acre ratio. Preservation in Coyote Valley is preferable, but preserving farmlands in other areas of Santa Clara County should also be considered for purposes of determining feasible mitigation. Preservation of agricultural land in other parts of the state does not adequately mitigate for the loss of local farmland and contradicts other local policies for farmland mitigation.

The claim in the PEIR that the "protection of other existing farmland, such as through the use of agricultural easements or outright purchase, would not be considered mitigation under CEQA because the net result of such actions would still be a net loss of farmland acreage" (PEIR at 193) contradicts more recent CEQA caselaw cited above and other local farmland preservation policies such as by Santa Clara County LAFCO and City of Gilroy. See also *Mira Mar Mobile Community v. City of Oceanside* (2004) 119 Cal.App.4th 477 and *Sierra Club v. County of Napa*, (2004) Cal.App.LEXIS 1467.

It is inappropriate to defer to project level mitigation (PEIR at 193-194) the decision of whether agricultural mitigation should be required. The PEIR projects the loss of farmland now, so deferring mitigation decisions to a later point contravenes CEQA.

Rooftop gardens and natural landscaping should be required. Once all agricultural land in Coyote Valley incorporated into the greenbelt is protected, the City should require rooftop gardens and extensive natural landscaping on developments on agricultural lands to help mitigate the loss of agricultural land. This will offset the effects of heat islands, maintain air quality in the area, and potentially provide habitat for raptors and other native, winged fauna.

IV. Impact on Serpentine Lands

Impact BIO-2 listed on pages 470-471 has been listed as significant. The mitigation described below will ensure the impact is lessened as opposed to the previous mitigation that does not commit to any measures.

The City is relying on the completion and implementation of the Santa Clara County Habitat Conservation Plan to create preserves and enforce measures to decrease nitrogen impact on serpentine lands. Before the HCP is implemented, and in case the HCP is not implemented, the City currently says it will develop its own measures if it has the appropriate resources, then continues to say that they do not have the appropriate resources. There needs to be a tangible interim mitigation to damage done to serpentine lands

created and implemented by the City and based on the proposals in the HCP. If the HCP is implemented, then the City can cease their mitigation only if the HCP is serving to at least fully mitigate the impact.

Some suggested mitigation measures include creating serpentine preserves to prevent nearby development, charging a nitrogen deposition tax on new developments in the sensitive areas, charging a fee on sewer hook-ups near the sensitive areas, and charging a gas or Vehicle Miles Traveled fee. These measures would help protect an extremely unique and fragile ecosystem from irreversible damage, and to reach that goal the City should devote as many resources as necessary. These mitigations should mandatory in the absence of an approved Habitat Plan.

V. Impact on Wetlands, Baylands, and Riparian Corridors, and on Wildlife Movement

Impact BIO -1 and BIO -4 have been listed as less than significant, but should be listed as significant.

Incorrect description of impacts on North Coyote Valley as less than significant. Page 458 of the PEIR states:

> Due to the relatively high levels of disturbance associated with already existing agricultural habitats that could be developed under the proposed General Plan, the relative abundance of suitable habitat for species such as raptors, other birds, and small mammals that use agricultural habitats both within the region and the state (e.g., when grassland availability in the vicinity in the Diablo Range and Santa Cruz Mountains is considered), impacts of development allowed by the General Plan to agricultural habitats within San José would be less than significant.

Documentation by the De Anza College Wildlife Corridor Stewardship Team that is briefly described by the PEIR but effectively ignored actually refutes this argument (see attached letter also available at http://www.sanjoseca.gov/coyotevalley/docs/Ltr_DeAnza_Wildlife_Study_04.14.08.pdf):

> "The 'heavily disturbed agricultural and developed areas on the Coyote Valley Floor' is currently providing a wildlife corridor for species of Coyote Valley that come from both mountain ranges and ones which are already in the valley" -7
>
> "Animals are not only moving but also foraging on the floor of Coyote Valley" -10
>
> "Agricultural lands are of high value to wildlife that forage" -10
>
> "One should not be surprised that such high animal use happens on the 'heavily disturbed agricultural and developed areas on the Coyote Valley floor'. These agricultural lands provide a home for a variety of rodents, which are the main prey for several predators found on the Coyote Valley floor. We have not gone a day in Coyote Valley with out seeing several California ground squirrels." -10
>
> "If [The Coyote Valley Specific Plan, making the same claim of less-than-significant impacts] were to be implemented it would have a highly significant impact to this existing wildlife corridor and the regional movement of species, thus completely halting the natural movement that wildlife species have implemented themselves. This movement has enabled

them to be able to exist in the last remaining large open space in the area of Santa Clara County" -11

These analyses show, as they did with the Coyote Valley Specific Plan, that significant wildlife impacts occur with development in Coyote Valley. (See also attached De Anza Wildlife Corridor Project Annual Report available at http://www.deanza.edu/es/wildlifecorrproj/CV%202008%20Annual%20Report%20Final%20V2%201_14_10.pdf ("Coyote Valley is one of two connectivity points between the Diablo Range and the Santa Cruz Mountains, the other being through the Pajaro River Basin, and is the only linkage with a direct connection between the two. If Coyote Valley is developed, the linkage will be lost and species in the Santa Cruz Mountains with large home ranges such as the mountain lion and the North American badger will be genetically isolated and local extinction may occur."))

Below are suggestions on refining policies to ensure mitigation measures are met:

- Policy ER-3.2 should be written with stricter language. Instead of calling a 100-ft setback "a standard to be achieved" it should be a required standard, unless it can be proven there is no feasible alternative. In the case where there is no feasible alternative, the farthest distance possible should be proposed as the setback and the City must review and approve the proposal, which should include measures to mitigate the project's impact on the riparian corridor. This minimizes impacts to the riparian corridors and waterways in a more tangible way than the recommendations from San Jose's Riparian Corridor Policy Study.

- With Policy ER-4.4, instead of "avoiding new development", changing the language to "prohibiting new development" will guarantee the mitigation is successful. In sensitive areas such as baylands and wetlands, all detrimental development should be prohibited, especially in specific regions where endangered species are known to breed or nest. Failure to adopt stricter policies on development in these areas will cause significant, irreversible damage to San Jose and the surrounding regions' wildlife populations.

VI. Other considerations.

Require recycled-water tolerant landscaping. To reduce impacts on water supply, the PEIR should include a mitigation that the Community Forest, City-managed landscaping, and other new landscaping be recycled-water tolerant.

Institute a policy on no-net increase in impervious surfaces: Either as a feasible mitigation for hydrological impacts or as an independent choice by the City to avoid environmental effects, it should institute the following as a mitigation or a new policy: "encourage an overall trend toward a net decrease in impervious surface areas through project renovations with a focus on parking lots, driveways, sidewalks, and patios, and investigate a project-specific, no-net-increase in imperviousness that would allow payment into compensation funds where projects require on-site increase in impervious surfaces."

Impact LU -7 should be considered significant. The Golf Course Overlay in particular creates the opportunity for tens to hundreds of acres of lost habitat that have not been analyzed in the PEIR. The Golf Course Overlay should be eliminated (existing courses will therefore be grandfathered). All other

disturbances should be limited to no more than 10% of the property's surface area. Only these changes can make this impact less than significant.

Conclusion.

Please contact us with any questions. Again, we appreciate the opportunity to comment and deadline extension, and we expect our comments will help improve the environment for San Jose for decades to come.

Sincerely,

Brian A. Schmidt
Legislative Advocate, Santa Clara County

Kelsey A. Grousbeck
Advocate Intern, Committee for Green Foothills

COMMITTEE FOR
GREEN FOOTHILLS

February 22, 2010

Envision San Jose Task Force

Re: recommended amendment to land use scenarios to rely upon "actual jobs" and not just jobs capacity for balancing employment and housing

Dear Envision San Jose Task Force members;

Several issues have become clear regarding the "jobs capacity" concept that is central to the choice of land use scenarios:

1. The jobs capacity number given in each scenario will not actually occur. Staff has openly admitted this; they have discouraged those of us who are dismayed by environmentally destructive Jobs:Employed Residents ratios from taking them seriously; and they have said the numbers should be seen at most as indicating relative degrees of emphasis.

2. The numbers are being used for planning purposes as if they will actually occur. Last meeting's discussion of VMT used the numbers as if they would occur, and the General Plan EIR will do the same.

3. If for some reasons the numbers are actually reached or nearly reached, the CEQA process for mitigating or stopping the environmental consequences will have long passed, because the EIR will be finalized many years before the actual development.

As has been discussed in many previous communications, any ratio of actual jobs to employed residents that exceeds a 1:1 ratio will require massive amounts of commuting from outside Santa Clara County , primarily residents of Central Valley coming to our area by car. City staff is concerned that any jobs capacity to employed residents ratio of 1:1 or less will result in an actual jobs level that is far lower, and hurt the City's finances.

The Committee for Green Foothills proposes the following compromise that could be included as an amendment to any current land use scenario:

The land use scenario should include a performance criteria requiring that the actual jobs to employed residents ratio to remain no higher than a 1:1 ratio. Development of jobs capacity in the City should happen in stages for different areas, and once the 1:1 ratio is reached, additional areas for additional capacity should not be readied for new jobs until the residential development level is also matched and planned to occur at approximately the same time.

An alternative recommendation is to "backload" the excess actual jobs, so that once the City has reached the 1:1 actual jobs:employed residents ratio, the jobs development cannot occur faster than residential development until all the planned residential development has occurred. This alternative is inferior to our main proposal because it will still allow severe environmental consequences from inadequate housing relative to jobs, but it is superior to the proposals currently in front of the Task Force.

The Committee for Green Foothills notes that adopting this recommendation as a mandatory performance criterion can greatly improve the planning process and reduce the environmental impacts in the resulting EIR. It places an upper limit on actual jobs that is much closer to what will actually occur, which means such issues as VMT calculations can reflect something approaching reality. It also eliminates the worst environmental impacts from

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commuting that staff would otherwise have to acknowledge in the EIR,[1] so the EIR that the City would publish with this criterion included will show fewer negative and more positive environmental effects.

As we have mentioned before, any increase over the current baseline jobs-to-employed residents ratio would be environmentally harmful, but we also recognize that some change is likely. Including larger levels of residential development in the City is important in our housing-poor region, especially transit-oriented and senior-oriented development. Above and beyond all that is the need to keep a balance of actual jobs to employed residents that is not available in most of the current land use scenarios.

Please contact us if you have any questions.

Sincerely,

Brian A. Schmidt
Legislative Advocate, Santa Clara County

[1] We believe a feasible mitigation for those impacts would be a similar performance criterion in the EIR, so the City has to consider this idea in any case.

De Anza College Wildlife Corridor Stewardship Team comments to the CVSP Task Force Members

by Julie Phillips (Morgan Family Chair in Environmental Studies, Tule Elk Biologist), Pat Cornely (Executive Director, Kirsch Center for Environmental Studies), Tanya Diamond, Lead Field Studies Instructor, Badger Biologist, Diana Martinez (Instructor), Ryan Phillips (Raptor Biologist/Conservation Biologist), Henry Coletto Field Consultant, Former Game Warden Santa Clara County, Field Studies Interns: Zari Aziz, Matthew Daily, Veronica Davis, Melissa Dekoven, Rosita Fakhrevaezi, Derek Lance Freihofer, Charles Gleaves , Jessica Gonzalez, Josh Goodwin, Lakhena Howey, Rick Malupo, Jana Marquardt, Stephen Navarra, Lori Parsons, Alan Smith, Pete Woolhouse

To establish the presence of wildlife species and wildlife corridors, a corridor analyses based on data collection must be performed (Beier 1992, 1993, Clevenger 2001, 2005, Federal Highway Administration 200a, Gloyne 2001, Noss 1987, Penrod, 2001). The CVSP DEIR and a subsequent Gavilan College DEIR made many false assumptions about wildlife presence and connectivity because there was no data collection or analyses performed.

De Anza College's Environmental Stewardship Program began a ten year project in 2005 researching movement corridors along the 37th parallel for connectivity between the outer (Santa Cruz Mountains) and inner coastal range (Diablo Range) in California. Since January 2007, an ongoing data collection effort has been conducted by the Stewardship team at De Anza College.

According to several wildlife corridor experts and the Santa Clara Habitat Conservation Plan, Coyote Valley serves as a critical wildlife corridor and habitat for many species (Thorne *et al* 2002, 2006, draft 2008). The proposed Gavilan campus development would result in severely impacting wildlife movement through this critical corridor.

Methods:

Our methods to determine wildlife presence and movement patterns consisted of formal tracking (scats, tracks, and visible observation), digital field cameras located at culverts and wildlife crossing locations, and observational data from different agencies (Halfpenny, 1996). Field data was collected weekly along a transect encompassing the northern and southern sections of Coyote Valley.

For each data point, the field interns GPSed the location, classified the habitat type, activity, sample age, proximity to human activity, and other information. Each data point was measured, photographed, and recorded onto data sheets. All data points were downloaded weekly and then mapped into an orthopohto (1m resolution 2005 USGS) and habitat layers consisting of vegetation, riparian corridors, wetlands, soil type, slope, roads, and urban layers using a GIS program (ArcMap ERSI 9.1).

Results:

Over the last 15 months we have collected over a 2,400 data points. These data points were then utilized to develop a connectivity map for the Coyote Valley Wildlife corridor. This connectivity map demonstrates that many wildlife species are utilizing the Highway 101 culverts to move from east to west and west to east. These culverts allow wildlife to travel from the east hills, such as Coyote Ridge, and including the Mount. Hamilton region of the Diablo Range, under Highway 101 to access the Coyote Creek County Park and then disperse into Coyote Valley and surrounding hills, including the Santa Cruz Mountains. The data also demonstrates that Coyote Creek County Park appears to be the core area of this corridor.

Many different species utilize Highway 101 culverts to travel under the highway. The picture, figure 1, below is the same culvert with multi-species use within a 1 month surveillance period. One of the 101 culverts was also utilized by a mountain lion. These data points of wildlife use of Highway 101 culverts were then mapped in GIS to develop a preliminary connectivity map for the Highway 101 corridor. This preliminary connectivity map demonstrates that many wildlife species are utilizing the Highway 101 culverts to move from east to west and west to east.

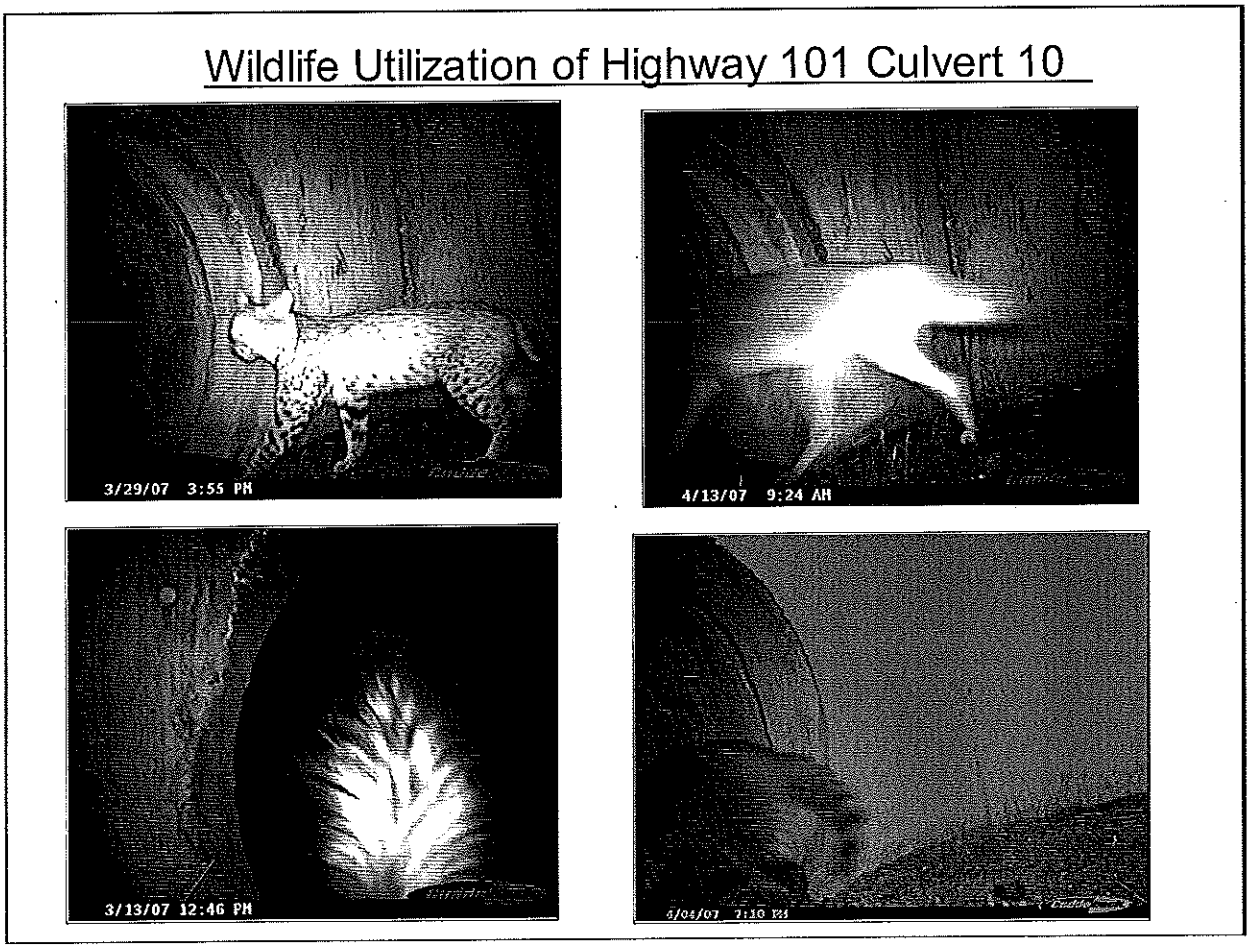


Figure 1: Multiple species' use of Highway 101 culvert

For the past 4 months, we have concentrated our data collection throughout the valley floor itself. We have found a highly significant amount of wildlife movement and utilization of valley habitat within Coyote Valley. Mutiple species such as bobcat, coyotes, and deer have been tracked from Coyote Creek habitat along Bailey Road to the Fisher Creek culvert and IBM. Wildlife has been recorded crossing Bailey Road and Santa Teresa Road into adjacent agricultural fields into the proposed development area. Mutiple species have also been identified traveling along both Laguna Road and Richmond Road east, west, north, and south directions, including in and out of agricultural fields. For example, along Laguna Road, multiple species tracks were observed, heading east and west out of the agricultural fields, please see figure 1 below. Laguna Road is adjacent to the proposed development.

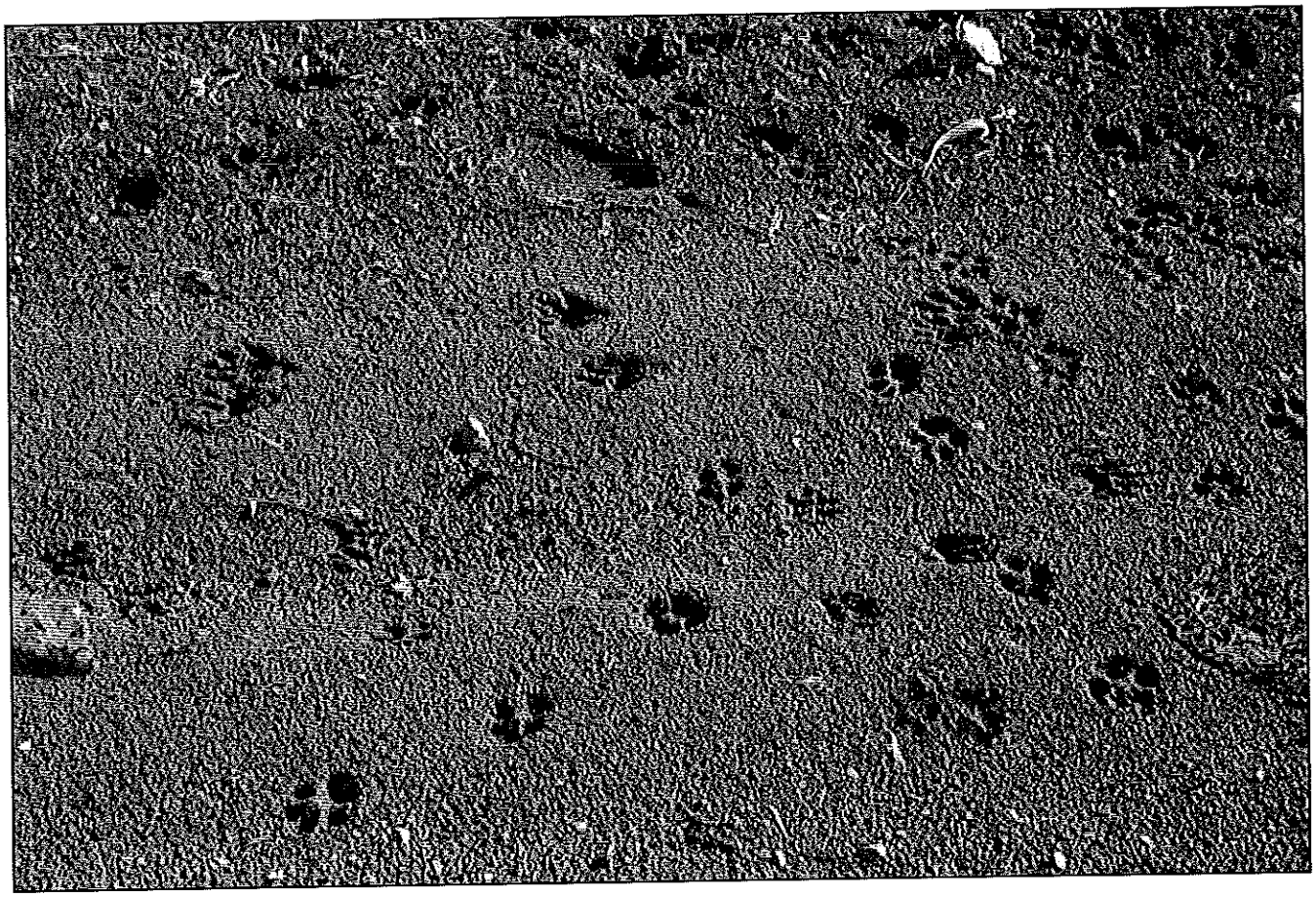


Figure 1: Laguna Transect, Mutiple species use

Along the east portion of the Laguna Road transect we used different colored flags representing different wildlife species, to mark tracks found along the road side. The red flags are bobcat tracks, the orange are coyote tracks, and the blue are raccoon. Many of these tracks are heading in and out of the agricultural fields, heading east, west, north and south. Below, is a picture, figure 2, of the data collected from the transect work.

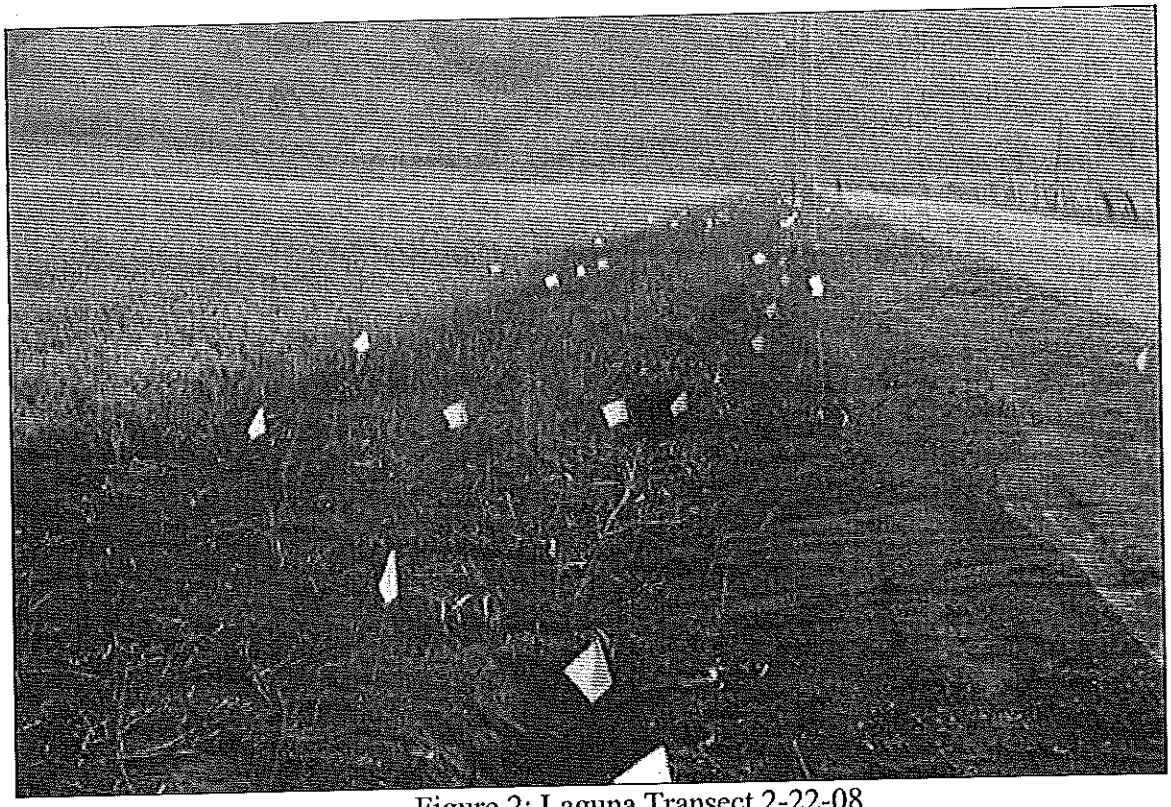
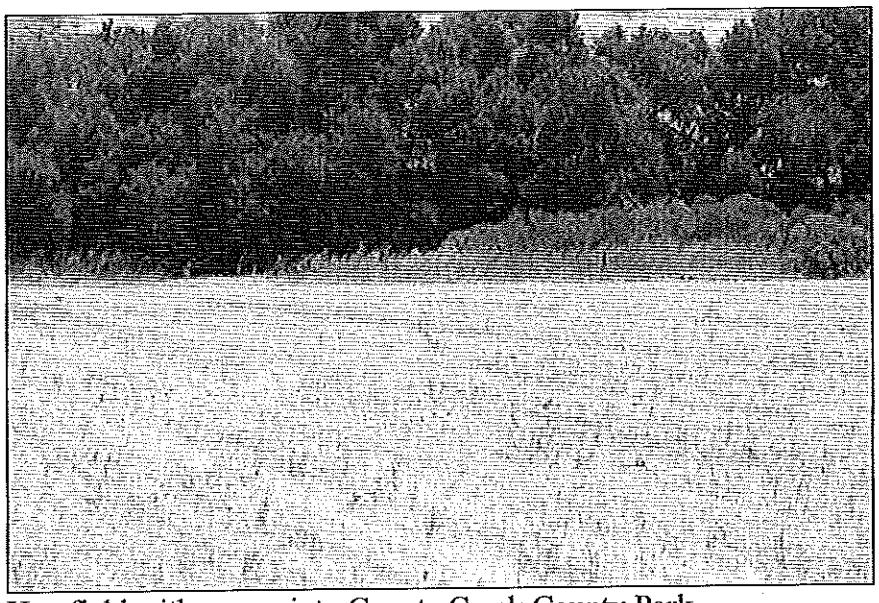


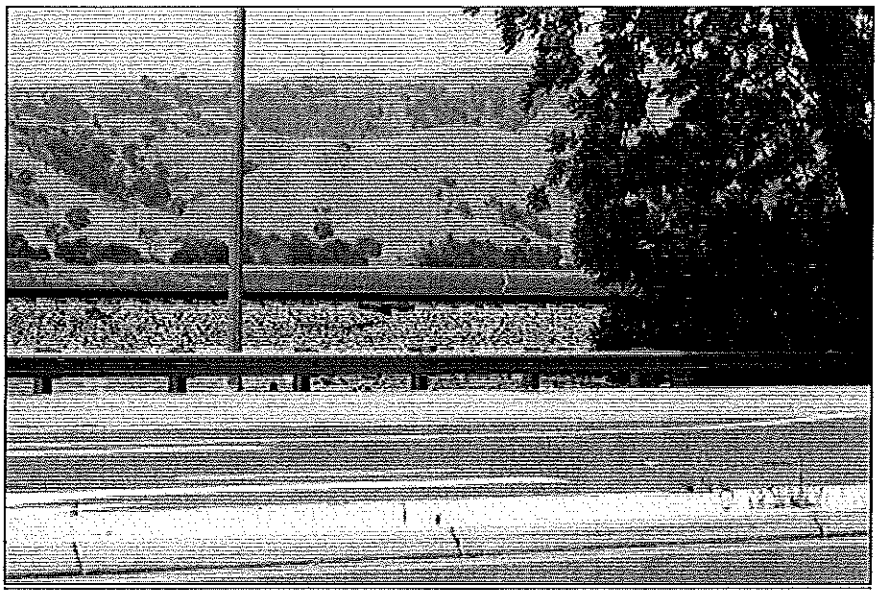
Figure 2: Laguna Transect 2-22-08

Three culverts located in the North section of Coyote Valley all have unrestricted access for wildlife to travel from the east hills to Coyote Creek habitat. In terms of a truly free barrier corridor, five surveyed culverts allow for wildlife to cross under Highway 101 into Coyote Creek habitat, in which wildlife can then travel through an orchard and hay field to Monterey Highway, in which the divider has not begun into Coyote Valley, then up into the hills. See pictures below of the orchard and hay field adjacent to Monterey Highway were there is no divider.



Hay field with access into Coyote Creek County Park

Orchard with access into Coyote Creek County Park



Monterey Highway north of Bailey Ave. without divider and access into Coyote Valley

Tulare Hill was also found be a high use area by species such as coyote, fox, badger, and many prey species which would attract predators to come up to hunt.

Impact to Wildlife Corridors

In the northern section of Coyote Valley, the Santa Teresa Hills, along with Tulare Hill, extends eastward towards Coyote Creek and the Diablo Mountain Range. This area is geographically the closest point between the Santa Cruz Mountain Range and the Diablo Range in the northern section of Coyote Valley. Even though this area is geographically the closest between the two mountain ranges, in the northern section of Coyote Valley, it does not mean that this is the only spot for wildlife dispersal or a corridor. "Corridors can be defined as any space identifiable by species using it that facilitates the movement of animals or plants over time between two or more patches of otherwise disjunct habitat" (Lididicker 1999, Corridor Ecology Hilty, Lidicker, Merenlender, 2006. Pg.90). **The "heavily disturbed agricultural and developed areas on the Coyote Valley Floor" is currently providing a wildlife corridor for species of Coyote Valley for species that come from both mountain ranges and ones which are already in the valley.**

As members of the De Anza Wildlife Corridor Stewardship Team, our tracking team has been focusing on Bailey Avenue to Highway 101 and South over the past several months. We have been making our way up Bailey Avenue from the Santa Teresa intersection and moving westward. Each day that we have been out on Bailey we have seen heavy amounts of animal signs (track or scat) on both the northern and southern sides of the road. The most common signs we have seen up to date have been coyote *(Canis lantrans)*, raccoon *(Procyon lotor)*, bobcat *(Lynx rufus)*, wild boar *(Sus srofa)* and white-tailed deer *(Odocoileus hemoinus)*. The earlier draft environmental impact reports state that "although wildlife species may disperse across, or occasionally forage at the shoulder of Bailey Avenue, wildlife use in this area is expected to be limited due to lack of cover and traffic disturbance". On two occasions we viewed and recorded a coyote *(C. lantrans)* utilizing the habitat quite close to and where the Gavilan College Coyote Campus project vision site is. The first coyote *(C. lantrans)* was seen at night, it was attempting to cross Bailey from the IBM property, however the car deferred it from crossing the road at the time. The second coyote *(C. lantrans)* we saw observed on 3/8/08, and was running north through Gavilan's project site. This animal ran across Bailey Road, about 50 feet in front of an oncoming car and crossed down into a small ditch in front of IBM property, see figure 1.

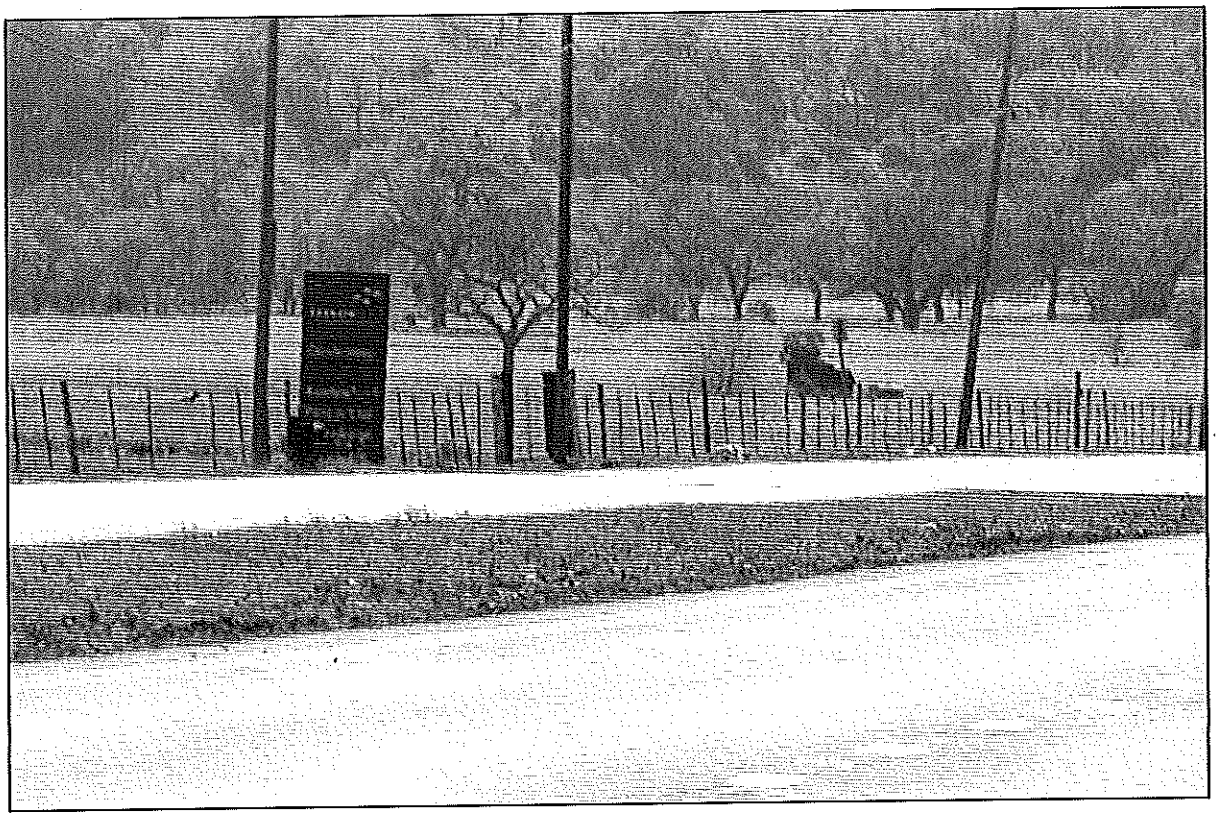


Figure 1: Live Coyote Sighting, running west through Sobrato Agricultural fields 3/8/08

Impacts to Wildlife Corridors

At the northern end of the Coyote Valley, the Santa Teresa Hills and Tulare Hill extend eastward to Coyote Creek, so that only the narrow Coyote Creek/Highway 101 corridor separates the foothills of the Santa Cruz Mountains to the west and the foothills of the Diablo Range (in the form of Coyote Ridge) to the east. As a result, this area is likely important for dispersal between the two ranges by wildlife that are less likely to cross the broader, more heavily disturbed agricultural and developed areas on the Coyote Valley floor. Such wildlife species include American badgers, bobcats.

Coyote Campus Master Plan
Gavilan Joint Community College District
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Draft EIR
February 2008

mountain lions, and coyotes. The project site is located adjacent to hills to the west and north that serve as important habitat for these species. However, being on the valley floor and being surrounded to the east and south by extensive agricultural lands, the project site is not located in an area that is expected to be used heavily by animals dispersing between the Santa Cruz and Diablo mountain ranges. The project site provides no distinctive or particularly valuable habitats that would be used (e.g., for foraging or cover) by such dispersing individuals.

These assumptions, which were not made on any data collection results, are completely false. The assumptions are also detrimental in making false claims about wildlife connectivity. Along the Bailey transect many tracks and scats were recorded adjacent and viewed within the proposed development site. We recorded numerous tracks of coyotes *(C. lantrans),* bobcats *(L. rufus)* heading north out of the agricultural fields onto Bailey road Bailey Avenue and also heading south into the agricultural fields.. Please see figure 2, below, as an example of data collection along the Bailey transect. Each flag represents a track within the agricultural fields of the proposed development site, which was viewed and recorded along the roadside. Flags were used to indicate tracks observed directly across the fence within the agricultural field. For each track, a picture was recorded and verified. Orange flags represent bobcat tracks, yellow flags represent coyote tracks, red flags represent fox tracks, and blue flags represent raccoon tracks.

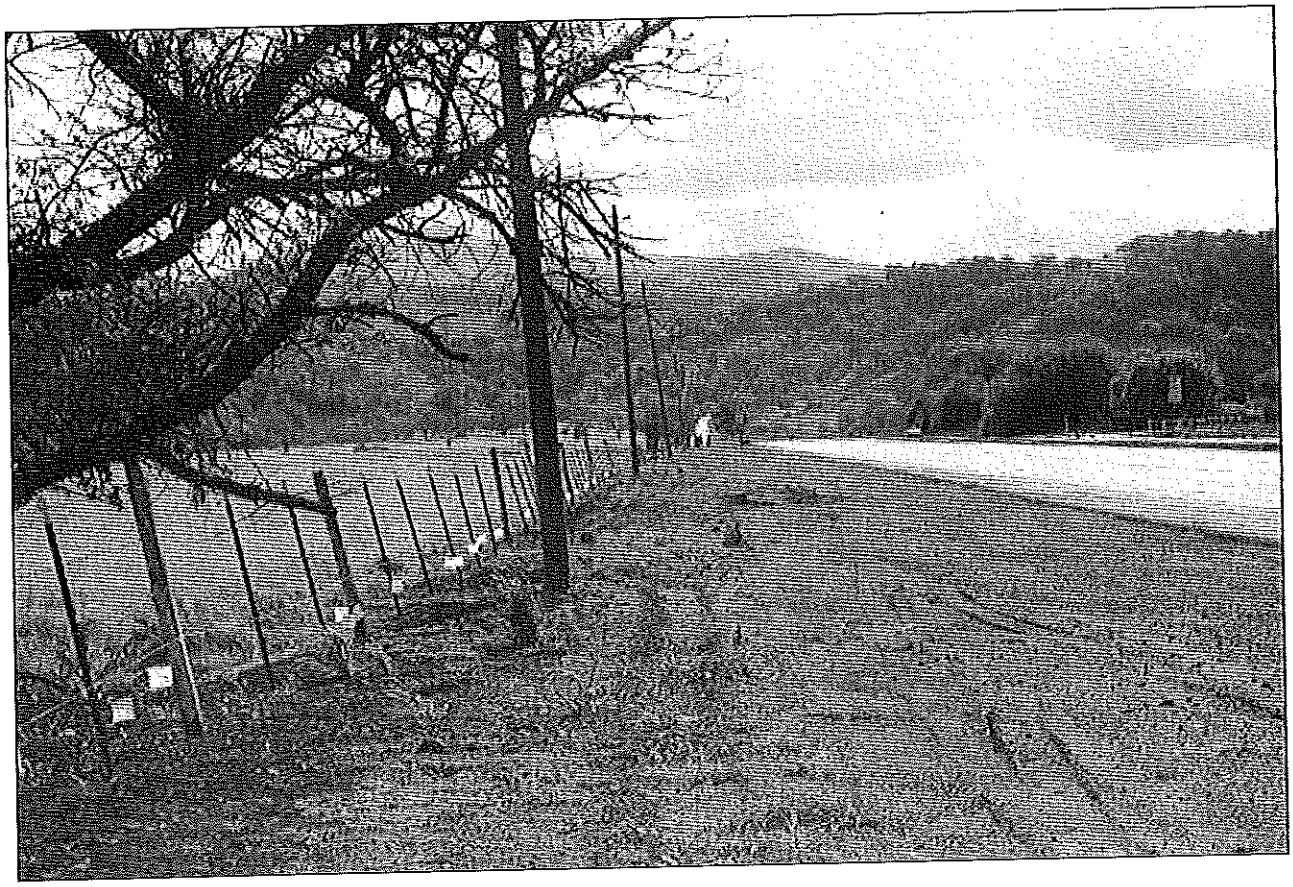


Figure 2: Multiple Species Use of Sobrato Agricultural Fields and surrounding areas in Coyote Valley

On another field research day we were focused around the Fisher Creek culvert. We were able to identify at least five different wildlife species utilizing the culvert and the surrounding area. We were able to record the tracks of a coyote *(C. lantrans)*, which were heading north from the edge of Bailey Avenue along Fisher Creek, (about 20 feet to the east of the creek). The Coyote was heading towards the riparian area of the creek. The riparian vegetation of Fisher Creek gives cover for species. Many studies have previously shown that wildlife will follow riparian corridors to travel by (Hilty et al 2006). Fisher Creek runs adjacent to the proposed development site and would be highly significantly impacted by the development plans. We also noted tracks of a coyote *(C. lantrans)* coming out of the riparian vegetation on the same day. **We have clearly found and documented that wildlife species are moving on the floor of Coyote Valley.**

One should not be surprised that such high animal use happens on the "heavily disturbed agricultural and developed areas on the Coyote Valley floor ". These agricultural lands provide a home for a variety of rodents, which are the main prey for several predators found on the Coyote Valley floor. We have not gone a day in Coyote Valley with out seeing several California ground squirrels *(Spermophilus beecheyi)*. We have also seen numerous rabbits, a type of cottontail. California ground squirrels *(S. beecheyi)* and rabbits are only a couple types of the prey sources along Bailey Avenue. Animals are not only moving but are also foraging on the floor of Coyote Valley. However, the DEIR states, "The project site provides no distinctive particularly valuable habitats that would be used (e.g., for foraging or cover) by such dispersing individuals". Not only have we found evidence of predators foraging (e.g. multiple kill sites), "predator(s) forage(s) outside of its usual habitat to take advantage of a prey resource..." (Corridor Ecology Hilty, Lidicker, Merenlender, Pg. 140). We have found extensive wildlife signs of movement and foraging along Bailey Avenue. From our findings we know that agricultural lands are of high value to wildlife that forage.

"Corridors may encompass altered or natural areas of vegetation and provide connectivity that allows biota to spread or move among habitat fragments through areas otherwise devoid of preferred habitat" (Andreassen, Ims, and, Steinset 1996, Perault and Lomolino 2000, Corridor Ecology Hilty, Lidicker, Merenlender 2006 Pg. 90). The Gavilan DEIR fails to mention in section 3.8 Biological Resources, in Impacts to Wildlife Corridors, the Fisher Creek culvert. Culverts facilitate movement of wildlife species. In late 2007 our team found an existing culvert along side Bailey Avenue, which Fisher Creek runs under. This passage offers and allows several species of wildlife to successfully move within the valley. Many of the species have been found using this riparian corridor through finding tracks and scat in the culvert have been Bobcats (*L. rufus)*, Coyotes *(C. lantrans)*, Raccoons (*P. lotor)*, and as well multiple other small mammal species. This culvert provides cover and protection for species from traffic disturbance and allows them to move through the valley floor near the project site. This culvert in itself is a wildlife corridor on the Valley's floor, see figure 3.

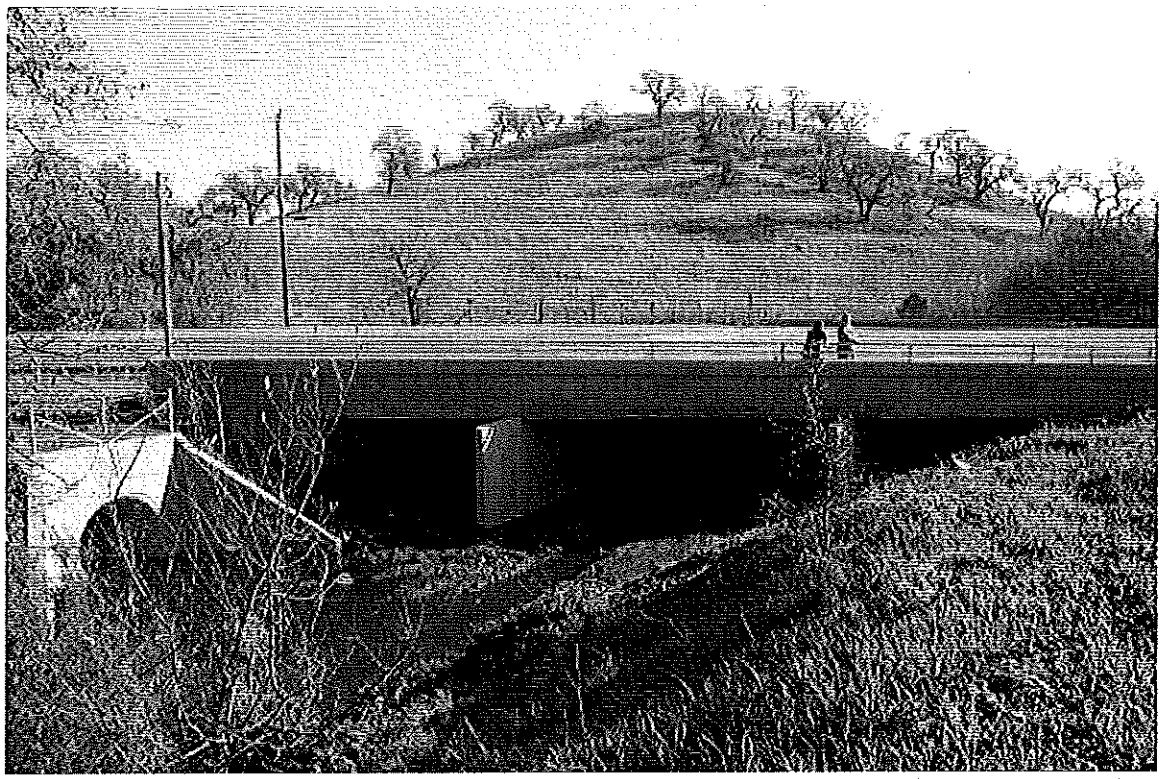


Figure 3, Fisher Creek Culvert located at Bailey road

The valley floor of Coyote Valley is a wildlife corridor. As previously noted "Corridors may encompass altered or natural areas of vegetation and provide connectivity that allows biota to spread or move among habitat fragments through area otherwise devoid of preferred habitat" (Andreassen, Ims, and, Steinset 1996, Perault and Lomolino 2000, Corridor Ecology Hilty, Lidicker, Merenlender 2006). The floor of Coyote Valley may encompass altered vegetation but it still serves as an important area for animal survival and dispersal between the Diablo Mountain Range and the Santa Cruz Mountain Range. Coyote Valley currently is full of wildlife of all types. Along Bailey Avenue has a variety of wildlife species that utilize the resources in the area. **If this project were to be implemented it would have a highly significant impact to this existing wildlife corridor and the regional movement of species, thus completely halting the natural movement that wildlife species have implemented themselves.** ***This movement has enabled them to be able to exist in the last remaining large open space in the area of Santa Clara County.***

Comments and Questions for CVSP Task Force Members dated 4-14-08:

The CVSP Task Force has not responded to our earlier comments and questions (or any of the over 1,000 pages of comments and questions to the CVSP DEIR), as far as we can tell. **First, we ask that you not send forward your CVP vision to the City Council as it has not undergone the essential environmental and fiscal review necessary** to maintain the public trust. To do so will be a complete betrayal to every person, organization, resource agency, and other institutions who commented and participated in the CVSP process, including the CVSP DEIR. If you decide to send forward your Plan

(versus a CEQA required Project), **we formally request that you attach this report to your "Coyote Valley Plan: A Vision for Sustainable Development" when submitted to the City Council on April 22, 2008:**

1) How can the DEIR claim that the development would pose a "Less Than Significant Impact" to the habitat, which is functioning as a critical corridor?

2) How can the DEIR claim that the development would pose as Less Than Significant Impact when this corridor has been cited as a critical corridor by the California Wilderness Coalition and by the Santa Clara Habitat Conservation Plan?

3) How is the loss of this critical corridor going to be mitigated for when it is the first open space for wildlife to cross between the Diablo Range and Santa Cruz mountains in Santa Clara?

4) How can it legally be claimed as a Less Than Significant Impact when we were able to collect data within just four months showing that there is a highly significant amount wildlife movement and utilization of the proposed development site?

5) How is the high increase in the volume of traffic that will increase wildlife mortality going to be mitigated within the final EIR?

6) How can you conclude that the CVSP is a "A Vision for Sustainable Development" and ask the City Council for the City of San Jose to do the same – based on an inaccurate and incomplete scientific assessment and fiscal analysis of the project?
7) **Under what criteria are you deciding that this development "plan" can support the title "sustainable"? The plan, as far as we can ascertain, was never titled "sustainable" until this latest version (i.e. Coyote Valley Specific Plan). We would consider this use of the word sustainable as "greenwashing".**
8) How can you ask the City of San Jose to accept a "Vision or Plan" that had more negative comments on the planning work than possibly any other plan in the history of Santa Clara County?
9) Why would you send forward a Plan or Vision that has not had any public response or involvement in addressing the hundreds of issues raised by organizations, members of the public, public agencies, community leaders and public officials?
10) Is the submittal of a CVSP Task Force "plan" versus "project" a strategy to circumvent the environmental and fiscal review required?

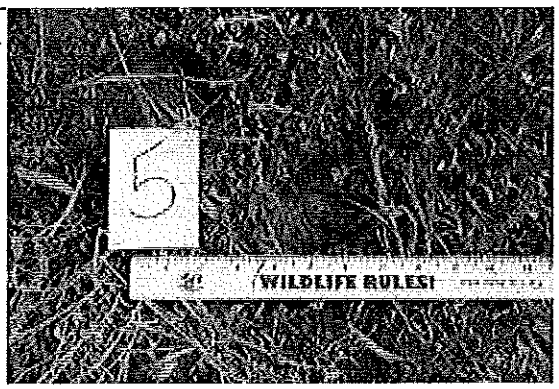
Reference

Hilty, Jodi A., William Z. Lidicker Jr., Adina M. Merenlender. Corridor Ecology *The Science and Practice of Linking Landscapes for Biodiversity Conservation.* Washington DC: Island Press, 2006.

Conclusion:

Coyote Valley Ecological Area consists of highly suitable habitat for many wildlife species. From our data collection, we have found consistent high use of the habitat by wildlife. We have also found that along the bike trail, when it is exposed to Highway 101's noise and light from the automobile traffic, species tend to avoid those areas of the bike trails. At some locations we have found that game trails become mutli-species use in avoidance of the highway. The pictures below are of a bobcat scat, coyote scat, and deer track at the same location. This indicates that increased traffic and light from the proposed development will negatively impact wildlife use of the some sections of the corridor.

Coyote Valley Wildlife Corridor Internship Team Data Collection



We have also been receiving quartly reports of road kill data from Santa Clara County Animal Control. A road kill data base can help identify where wildlife is trying to move unsuccessfully. These areas can then be modified in terms of using fencing to guide animals to existing culverts. Or to identify areas of high animal use to implement a land bridge, overpass, or modify a high use road into a tunnel. There is already a high mortality rate for wildlife moving throughout the proposed development area, an increase in traffic volume would result in a higher rate of wildlife mortality.

Poor planning will lead to costly problems and damage which could be avoided if the plan is modified in a manner that is based on the best available science, data collection, and expertise, which is all readily available to your staff if you make the effort to work with us.

Will this wildlife corridor, which has been identified as a critical connectivity region by corridor experts, be cut off by the development plans or will there be discussions with DEIR staff for plans on how keep the wildlife corridor intact (Thorne et al 2002) ?

According to several wildlife corridor/connectivity experts and the Santa Clara Habitat Conservation Plan, Coyote Valley is a critical wildlife corridor and habitat for many species (Thorne *et al* 2002, 2006, draft 2008). At the Sierra Azul Wildlife Connectivity Decision Makers Workshop, hosted by the Elkhorn Slough Coastal Training Program, on January 29, 2007, a presentation on a Wildlife Corridor Analyses for North American Badger (*Taxidea taxus*) within the Coyote Valley region by Tanya Diamond, graduate student at San Jose State University. In attendance were WRA environmental consultants who participated in writing the DEIR. This presentation included several corridor analyses showing that Coyote Valley consists of both critical core habitat and a corridor for badgers, which are a Species of Special Concern (Dept. of Fish & Game, 1986). Please see attachment of corridor analyses.

This data collection effort was spurned by the concern the wildlife species such as Tule elk, badgers, mountain lions, bobcat, deer, foxes, coyotes, and many other species would lose a critical habitat that serves as important connectivity. It has been demonstrated that corridors can facilitate the movement of species through habitat patches by providing connectivity (Hilty *et al* 2006, Soule and Gilpin 1991).

Connectivity between habitat patches is critical to maintain genetic viability and maintain viable populations of wildlife (Noss, 1987, Buza et al 2000). Wildlife corridors facilitate the movement for wildlife species to find mates, resources, and for juveniles to disperse out of their parental home range (Beier 1983). This is a very important concern for badgers as they exist in small populations and low densities because of their large home ranges. Further efforts will be made to see if badgers should be federally listed. Genetic isolation of badgers due to fragmentation from the proposed development could result in badgers becoming a listed species which results in very costly future management efforts for developers, the City of San Jose, and resource agencies. Please see Tanya Diamond's comments on the DEIR for further information about North American badger populations and connectivity issues within the region.

Questions assembled by Stewardship Research team to the City of San Jose planning staff and leadership and the Coyote Valley Specific Plan Task Force:

<u>Why was this analyses or any mention of wildlife corridor for badgers left out of the DEIR? Especially when great efforts on many people's part and time were made to get this information to the DEIR staff while they were writing the DEIR?</u>

<u>Why weren't these methods which are used to establish wildlife presence and corridors not conducted by the DEIR staff?</u>

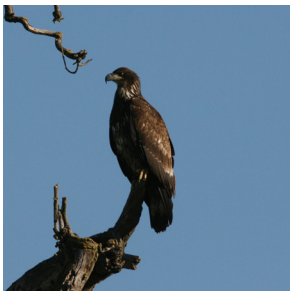
<u>Why was it stated that badgers would be less likely to cross heavily disturbed agricultural field when that is on of the most common types of habitat for badgers to forage in and travel through (Dept. of Fish & Game, Species of Special Concern report, draft in progress)?</u>

Knowing that a scientific evaluation consisting of data collection should have been conducted by the methods we have been utilizing, why did the DEIR staff not conduct their own analysis and data collection effort? Because of the fact that Coyote Valley has been identified as a critical wildlife corridor and the fact that it is one of the first places for wildlife to cross from the Hamilton Region of the Diablo Range to the Santa Cruz Mountains, this should have been a high priority for in-depth research.

As wildlife biologists, who specialize in corridor design, we ask why didn't the DEIR consultants conduct this type of data collection of wildlife use throughout the valley floor?

Coyote Valley Wildlife Corridor Monitoring Program 2008 Annual Report

De Anza College Wildlife Corridor Stewardship Team



Coyote Valley Wildlife Corridor Monitoring Program 2008 Annual Report

Ryan Phillips, Tanya Diamond, Julie Phillips, Pat Cornely, Vicki Jennings, and Lisa Morton

Contributors
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We wish to thank the following academic collaborators and governmental, nongovernmental and non-profit partners for their involvement and assistance in this program: Santa Clara County Parks, Santa Clara Valley Audubon Society, Peninsula Open Space Trust, California Department of Fish and Game, Santa Clara Valley Water District, Valley Transportation Authority, Caltrans, Committee for Green Foothills, Santa Clara HCP/NCCP, Cyber Trackers, Silicon Valley Land Conservancy, San Francisco Bay Estuary Institute, UC Davis Environmental Science and Policy Department, UC Davis Road Ecology Center, Save Coyote Valley Group, Santa Clara Open Space Authority, Big Sur Land Trust, and Midpeninsula Regional Open Space District.

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Abstract

To explore connectivity along the 37th parallel (specifically the wildlife corridor between the Santa Cruz Mountains and the Diablo Range) in California, De Anza College's Environmental Studies Department (Environmental Stewardship Program) launched a long term wildlife corridor study in 2005. In January of 2007, the Coyote Valley Wildlife Corridor Program began to conduct biological surveys to assess diversity of mammals, birds and plants in Coyote Valley. The main goal of Phase 1 was to collect data in the region connecting the Diablo Range to the Santa Cruz Mountains and identify movement and presence of wildlife species within the habitat linkage.

The data presented in this report was collected from February 2007-December 2008, on both mammals and birds and includes three months of plant surveys. One of the goals of this report is to help inform regional land use planning and provide connectivity maps for resource agencies, non-profits and other policy makers. Another goal is to further exemplify that the Coyote Valley landscape is a vital link between the Santa Cruz Mountains and the Diablo Range.

Specific objectives of this long-term program include:

- Establish east to west, west to east, north to south and south to north movement of vertebrate species between the Diablo Range and Santa Cruz Mountains
- Develop species lists and assess community composition and habitat structure
- Establish baseline data on status, distribution and seasonality of all species recorded

- Determine the relative abundance of focal species, including sensitive species within the study site
- Determine permeability of Highway 101
- Develop habitat suitability and connectivity models through GIS
- Utilize Rapid Assessment Methodology (RAM) for field teams to use as a baseline for rapid identification of critical wildlife corridors in the Central Coast Region
- Reconnect thousands of students and the public to the Coyote Valley landscape and educate them about the various environmental science disciplines
- Continue to build partnerships to help protect critical wildlife corridors throughout California

Summary

Plant and animal surveys were conducted through line-transects, point counts, camera trapping, quadrant plots, and Rapid Vegetation Assessment methods. For the avian surveys six 500 m line transects were monitored to survey for all species of birds in multiple habitats; seventeen variable radius point counts were monitored to survey all raptor species with a maximum radius of 500 m; Breeding Bird Atlas (BBA) (Bousman 2007) protocols were used to assess the breeding status of all species; and quadrant methods were used to survey for raptor nests. Mammals were surveyed through camera-trapping, live sightings, and line transects identifying tracks, scat or other signs.

Between December 2007 through December 2008, 166 bird species were observed in Coyote Valley, which represents approximately 57% of the species that are known to occur in Santa Clara County (Bousman 2005). Seventy-one species were confirmed or suspected of breeding within Coyote Valley based on the BBA guidelines (Table 1, 3). Of the 166 species observed 13 are special status species in California: the American White Pelican (*Pelecanus erythrorhynchos*), Northern Harrier (*Circus cyaneus*), White-tailed Kite (*Elanus leucurus*), Swainson's Hawk (*Buteo swaisoni*), Golden Eagle (*Aquila chrysaetos*), Bald Eagle (*Haliaeetus leucocephalus*), Peregrine Falcon (*Falco peregrinus*) (Fig. 1), Vaux's Swift (*Chaetura vauxi*), Short-eared Owl (*Asio flammeus*), Burrowing Owl (*Athene cunicularia*), Loggerhead Shrike (*Lanius ludovicianus*), Yellow-breasted Chat (*Icteria virens*) and Tricolored Blackbird (*Agelaius tricolor*) (Shuford and Gardali 2008). On the rarity scale of 1-6 (6 being the rarest) in Santa Clara County, twelve 4's, four 5's and one 6 were observed in Coyote Valley with the 6 being the second county record of Crested Caracara (*Caracara cheriway*) (Bousman and Smith 2009) (Table 2).

Figure 1. Juvenile Peregrine Falcon at the Ogier Ponds. Photo taken by Ryan Phillips

Twenty-four mammal species have been identified in Coyote Valley (Table 4). A total of 1,787 mammal detections (including both tracking transects and field camera traps) were recorded throughout the study site from February 2007- December 2008. Eight hundred and eighty eight animal detections were recorded along the tracking transects throughout the study period, and 910 animal detections at the camera stations. Two sensitive species

recorded repeatedly at different locations within the study site were the North American badger (*Taxidea taxus*) and the dusky-footed woodrat (*Neotoma fuscipes*).

One hundred twenty-four species of the Coyote Valley flora were identified within the study area during 2008 including *Cirsium fontanale* var. *campylon* (Mt. Hamilton Thistle), a candidate species for listing on the federal endangered species list (Figure 10).

Introduction

As part of a regional landscape connectivity analysis along the 37th parallel, the De Anza College Environmental Studies Department (Stewardship Program) has been collecting data within the Coyote Valley landscape encompassing the Diablo Range and the Santa Cruz Mountains. The Santa Cruz Mountains are becoming increasingly isolated from the rest of California due to development to the south and east, the Pacific Ocean to the west and San Francisco Bay to the north. Coyote Valley is a key connectivity point in the landscape and one of the last east–west wildlife connections in California's Central Coast (Thorne et al. 2002) (Figure 2). The Santa Clara Habitat Conservation Plan has also identified three wildlife linkages in Santa Clara County, two of which are within the Coyote Valley landscape (Santa Clara HCP Administrative Draft 2008). Previous to this study there was limited research conducted on Coyote Valley's wildlife and species movement through the valley floor and connected landscape.

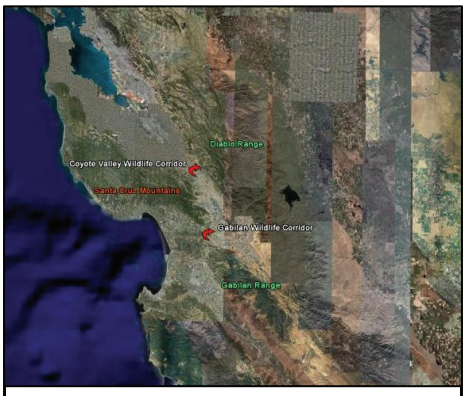

Figure 2. Santa Cruz Mountain linkages.

In February 2007, the initial mammal surveys investigated Highway 101 corridor to assess east and west wildlife movement between the Diablo Range and Santa Cruz

Mountains through Coyote Valley, using the Rapid Assessment Methodology (RAM) developed by the Environmental Studies faculty. Remote sensor cameras were placed along Highway 101 culverts. After it was established that there was multi-species movement through culverts under Highway 101, a more rigorous monitoring protocol was established through the use of line transects throughout Coyote Valley to locate areas and habitat through which mammals were traveling. In addition, line transects were conducted along major roads throughout the valley floor.

In January of 2008 avian research was started to determine the status of the avifauna in Coyote Valley. Then in April of 2008, a three month vegetation survey was conducted to determine what plants were present in Coyote Valley.

The data obtained from this long-term study will inform the process to protect the Coyote Valley landscape, including the critical and threatened linkages that provide connectivity for wildlife. It will also help inform long term management planning efforts, including the Santa Clara Habitat Conservation Plan and City of San Jose Envision 2040.

Study Area and Methods

Study Area

Figure 3. Orthophoto of Coyote Valley. Data source: www.geocomm.com.

The Coyote Valley landscape is a mosaic of farmlands, orchards, wetlands, riparian corridors and residential housing located in Santa Clara County between Morgan Hill and southern San Jose. The total land area of Coyote Valley is approximately 7,000 acres (28 km²) and is one of the largest remaining contiguous tracts of undeveloped valley floor, which connects the Santa Cruz Mountains with the Diablo Range (Figure 3).

The southern portion of the valley is the "green belt" zone, which consists of residential development and commercial factories, and the northern part consists of agricultural fields. The northern and southern sections are not considered feasible for inclusion in the corridor planning.

The Coyote Creek watershed encompasses Coyote Valley, two riparian corridors, Coyote and Fisher Creeks, the Laguna Seca wetlands in the north valley and Ogier Ponds, the man-made pond system in the southeast portion of Coyote Creek County Park.

The total study area for both the mammal and bird surveys encompassed most of Coyote Valley, including Coyote Creek County Park and Tulare Hill Ecological Reserve. Other observations were made in Calero County Park and Rancho Del Oro Open Space in the Santa Cruz Mountains to the west of Coyote Valley, although that information is not included in this report. The vegetation surveys were conducted in the "green belt" zone, Coyote Creek County Park, and Tulare Hill Ecological Reserve due to restricted access.

Avian Surveys

Survey techniques included strip line-transects, variable radius point counts, Breeding Bird Atlas surveys (Bousman 2007) and raptor nest surveys. Six 500 m line-transects, monitored monthly, were established throughout Coyote Valley and were chosen randomly depending on accessibility of certain lands (Figure 5). Transects were set up in all habitat types within Coyote Valley for comparison of species composition of bird species. Transects were conducted monthly along a 500 m long line for 45 minutes (with two 30 m bands). All birds were recorded within or outside 30 m from the transect or as a flyover, so abundance of species that were hard to detect past 30 m, such as sparrows, could be quantified without survey error. Flyovers were not included in the abundance calculations, but were used for presence or absence. The time of day that the surveys were started was dependent on the season. During the breeding season (March-August) transects were started within 30 minutes of sunrise. During the non-breeding season (September-February) the time in which a transect was started was dependent on the predicted daily high temperature. If the daily high temperature was below 80º F then the transect was conducted before 1400, but if the high reached 80º F or above then the transect was conducted prior to 1100. Transects were not conducted if rain or winds above a 3 according to the Beaufort Scale were occurring.

Figure 4. Rock Wren on Tulare Hill. Photo by Ryan Phillips

Sixteen variable radius point count stations were established to survey raptors in Coyote Valley. Point counts were set up evenly distributed a minimum of 500 m apart throughout

Coyote Valley with all habitats being monitored. Each point count station was conducted monthly throughout the year to determine seasonality, species composition, relative abundance and density, and habitat utilization. Each count lasted 10 minutes and all individual raptors were recorded within a 500 m radius. Individuals recorded in point count stations along riparian corridors were recorded within a 200 m radius due to visibility problems and difficulty detecting individuals outside that distance. For each individual observed the estimated distance to that individual, direction to the bird, habitat first observed in, if it was flying over or flying but using the habitat, whether it was first detected by sight or ear, was it adult, immature or juvenile and what sex if that could be determined was recorded.

Breeding bird data was compiled using criteria of the "Breeding Bird Atlas of Santa Clara County, California" (Table 1) (Bousman, 2007). A Breeding Bird Atlas (BBA) survey categorizes each species breeding within a geographic region by using various behavioral observations. A list of the breeding status of bird species in Coyote Valley was compiled. Point count surveys for raptors and nest surveys were also conducted to determine nesting density, intraspecific and interspecific competition, habitat usage, and nesting success and productivity. In 2008, priority was given to locating as many nests as possible to determine density. In 2009-2010 the research will focus on habitat utilization, nesting success and productivity.

Prior to the raptor nesting season, which begins in late February for most species, trees were surveyed throughout the study site for possible raptors nests while the deciduous trees were without leaves. All possible nests were georeferenced and then checked during the breeding season for activity. If an active nest was located, data were collected and

disturbance to the nest limited with observations conducted from a minimum distance of 100 m depending on anxiousness of the birds. The status of each nest was monitored two times per month to determine the length of the different stages, incubating, branching, and fledging, of the breeding cycle.

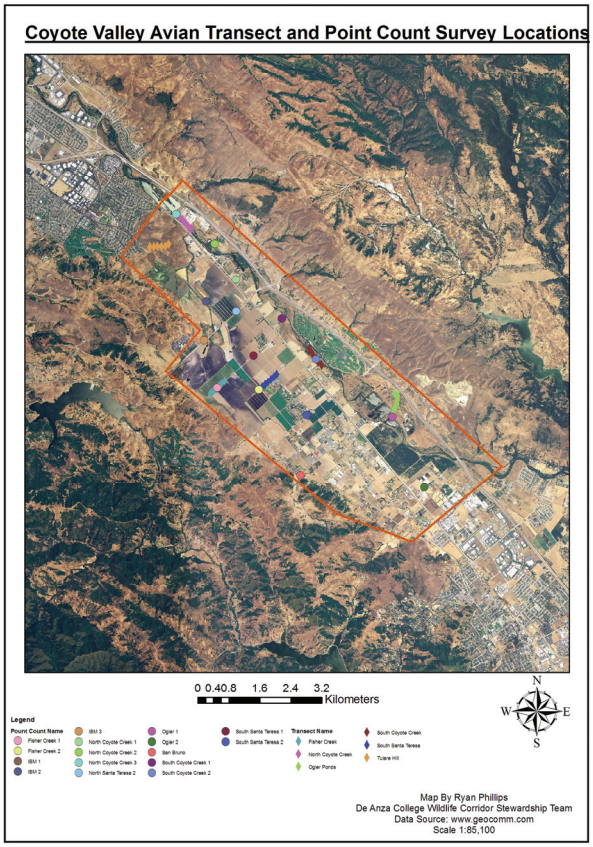

Figure 5. Study area for the avian surveys, including transect and point count locations.

TABLE 1. Criteria for classification of breeding bird status (Bousman 2007).

Observed (OB)

X – Species was observed as present in this grid.

Possible (PO)

√ Individual (male or female) seen in suitable nesting habitat in breeding season.
X – Singing male in suitable habitat in breeding season.

Probable (PR)

P – Pair in suitable habitat in breeding season.
S – Territory presumed through song at same location on at least two occasions 7 or more days apart.
T – Territorial defense (chasing birds of the same species).
C – Courtship behavior or copulation observed.
N – Visiting probable nest site.
A – Agitated behavior, scolding of observer as if near a nest.
B – Nest building by wrens; Hole excavation by woodpeckers.

Confirmed (C)

CN – Carrying nest material (use this code with care).
NB – Nest building (except by wrens and woodpeckers).
PE – Physiological evidence obtained from bird in the hand (brood patch, egg in oviduct, etc.).
DD – Distraction displays.
UN – Used nest of eggshells found (careful documentation required).
PY- Precocial young incapable of flight and restricted to natal area
FL – Recently fledged altricial young or downy precocial young incapable of sustained travel.
ON – Occupied nest.
CF – Adult carrying food for young.
FY – Adult feeding recently fledged young.
FS – Adult carrying fecal sac.
NE – Nest with eggs.
NY – Nest with young seen or heard

Abundance Codes

1: 1 pair estimated
2: 2-10 pairs estimated
3: 11-100 pairs estimated
4: 101-1,000 pairs estimated
5: 1,001-10,000 pairs estimated

Mammal Surveys

Introduction

In the published literature by leading corridor experts, the minimum width of a viable corridor for multiple species is 2 km wide (Penrod et al 2006). The current width of the corridor within Coyote Valley is 1.95 km. Losing any habitat within Coyote Valley will decrease the effectiveness of this linkage for multiple species.

Surveys were conducted along Highway 101 culverts and underpasses. Figure 6 shows the study area for the mammal surveys including the culverts running under Highway 101.

Figure 6. Study area for the mammal surveys, including culvert locations.

To determine mammal presence and absence, species composition, movement patterns, and high usage areas noninvasive field techniques were used involving formal tracking (scats, tracks, and live sightings), digital field cameras, line-transects, and observational

data from different agencies (Long et al. 2008, Spencer 2005, Conservation Biology Institute 2003). Field data were collected weekly along transects encompassing the northern and southern sections of Coyote Valley, on public lands within the study site. For each data point, the field team recorded GPS coordinates for each location, time of day, date, classified the habitat type, sample age, proximity to human activity, and other relevant information. Each data point was measured, photographed, and recorded into a datasheet (Figure 7). All data points were downloaded weekly and then mapped onto an orthophoto (1 m resolution 2005 USGS). Digital habitat layers consisting of vegetation, riparian corridors, wetlands, soil type, slope, roads, and urban layers were also added into the map using GIS (Penrod et al. 2006, ArcMap ERSI 9.1).

To document wildlife movement through certain locations, such as the Highway 101 culverts, Cuddeback infrared field cameras were used, which take a 1 minute video clip along with a photograph. Using these remote cameras allowed us to document animal movement detections throughout the Highway 101 culvert system.

Track station transects were established throughout the valley floor and were approximately 1 mile long, generally following roads and trails (human and wildlife game trails) at each study site (Long et al. 2008). Five track stations were placed at 250 m intervals along each transect. Tracks for each species were recorded using a Garmin Etrex handheld GPS unit in UTM NAD 83, measured in inches, photographed, and direction of travel was also recorded.

ON TRAIL WORKSHEET
Coyote Valley Corridor Coalition Project 2007

Date: 3/10 **Recorder:** Jessica G **Group#:** ____ **Site #:** 2 **Page Number:** 1

Weather: sunny 18-0024 **Start Location UTM Easting/Northing:** (30) 0561 0844 N 4119578

Observations (animals seen, etc): ____ **Sampling:** 1 meter on either side of bike path.

Person entering data into Excel: ____ **Key:** R=Rabbit, C= Coyote, Ra= Raccoon, D=Deer, P= Pig, D_= Dead animal, MTL=Mountain Lion Track, MTS=Mountain Lion Scat, PTMS=Potential Mtn Lion Scat, F=Fox.

Animal	Track or Scat (T/S)	Photo #	Distance from Trail (meter)	New/ Old (scat) (N/O)	Size (Length,Width) (meter)	Notes:
201 coyote	scat	6 (35)	on trail	OLD	4 1/2 in long 1 1/2 in wide	on the trail
202 coyote	scat	7 (36)	on trail	OLD	2 1/2 in L 1/2 in W	right off trail
203 coyote	scat	8 (37)	off trail 4in	OLDER	4 1/2 in long 1/2 in W	smaller coyote
204 rabbit	scat	9 (38)	off trail	OLD	3 inch long quarter in W	round pellets off trail
skip point 205						
206 coyote print	track	10 (40)	on trail		3 1/2 in L 5 in W	on path animal path
207 coyote (scat)	scat	11 (41)	on trail	OLD	1 in L 1/2 in W	animal path
208 (coyote scat)	scat	12 (42)	on trail	OLD	2 1/2 in L 1/2 in W	coyote marking 3 in long
209 deer (track)	track	13 (43)	on trail		2 1/2 in L 2 in W	deer print
210 coyote (scat)	scat	14 (44)	on trail		2 in L 1/2 in W	bones in scat
211 coyote (scat)	scat	15 (45)	on trail	OLD	2 1/2 in L 1/2 in W	
		(46)	on trail			animal path
212 (coyote scat)	scat	16 (47)	on trail	OLD	2 in L 1 in W	on animal path
213 (coyote scat)	scat	17 (48)	on trail	OLD	2 in L 1/2 in W	on animal path
214 raccoon (scat)	scat	18 (50)	on trail		2 in L 1/2 in W	
215 coyote (scat)	scat	19 (51)	on trail	OLD	4 1/2 in L 1 1/2 in W	animal path coyote marking tree
216 coyote (scat)	S	20/54	on trail	O	3 1/2" L 1" W	on animal path
217 coyote (scat)	S	21/55	on trail	O	2 1/2" L 1/2" W	on animal path
218 rabbit (scat)	S	22/56	on trail	N	1/4" L round 1/4" W	on animal path
219 jackrabbit burrow		23/57		O	8" W	abandoned
220 bird kill site		24/58	on trail	N	2" L 1" W	photo of backbone section
221 rodent kill site		25/59	on trail	N	1" L 1/2" W	photo of skull

Figure 7. Example of the line-transect data sheet.

Tracks without positive identification were omitted from data collection. For each track station, relative abundance is expressed as the total number of visits recorded for a species, divided by the total sampling effort (Linhart and Knowlton 1975). The track station transect index is calculated as (adapted from Crooks and Jones 1999) Ti =vi/(sini) (Multiple Species Conservation Program 2003). In some locations, additional track stations were set up on either side of a road crossing structure, for example at the Highway 101 culverts (Multiple Species Conservation Program 2003, Maintaining Ecological Connectivity Across the "Missing Middle of the Puente-chino Hills Wildlife Corridor 2005).

1) Camera Monitor Stations:

- Cameras used: 10 field cameras: 3 Cuddeback Infrared, 3 StealthCam digital cameras, 4 StealthCam 35mm
- Cameras placed at high use trails, highway culverts, water stations, or baited locations of interest
- Each camera station consisted of a 30 day monitoring period
- Cameras checked every 7 days (Figure 8)

Figure 8: Example of culvert camera results, Bobcat heading east at Culvert 10. Photo courtesy of Tanya Diamond.

2) Wildlife Tracking Survey:

For every wildlife sign; live sighting, camera image, track, scat:

- GPS coordinate recorded in datum NAD 83 and coordinate system UTM Zone 10
- Photo, including date, picture number, and GPS point for reference
- Measurement of the track, scat or sign is recorded in a data sheet (Figure 9)

Figure 9: Example of track data collection. Coyote track on Bailey Road on 2 February 2008.

3) Casting of Wildlife Tracks:

- Tracks of special interest/focal species and/or an indications of significant movement were recorded by making casts of track
- Tracks, measured by length then width, were recorded on a data sheet and a photo of the track was taken (with ruler for scale and note card with data information)
- Data information cards include the species name, date, photo number and direction of travel
- For each track casting, the species common and scientific names, the measurement of the track length and width (inches), the date, the site location including GPS waypoint and the direction of animal travel is recorded

4) Mapping of all data recorded including Camera Stations using GIS ArcView 9.1:

Data were mapped using GIS software on HP Computer Tablets

- Data were downloaded into an Excel Worksheet 4.0 file
- Data were then imported into an Microsoft Access Database
- The Microsoft Access Database file was then added into ArcMap, and a shapefile was created with the information included in the Microsoft Access Database
- Each species location was mapped out

Corridor Width Analyses

Corridor width was determined utilizing two methods, one derived from Penrod et al. (2006) and Quinn and Diamond, in press. The first width analysis (Penrod et al. 2006) was designed to consider multiple species including mammals, birds, reptiles, and plants. The authors of the South Coast Missing Linkages Project report state that, "While the size and distance among habitats (addressed by patch size and configuration analyses) must be adequate to support species movement, the shape of those habitats also plays a key role. In particular, constriction point-areas where habitats have been narrowed by surrounding development can prevent organisms moving through the Least-cost path corridor design. To ensure that functional processes are protected, we imposed a minimum width of 2 km (1.2 mi) for all portions of the final Linkage Design."

The second corridor width analysis (Quinn and Diamond in press) developed for North American badgers can be used for any other animal species. The analysis involves averaging all the known home ranges of the species of interest and dividing by two: x (mean) of home range /1/2 = corridor width, (Paul Beier & Wayne Spencer pers. comm.).

Plant Surveys

A checklist of the Coyote Valley flora observed during the 2008 study period was prepared (Table 6). Special attention was given to the identification of species with special status. such as *Cirsium fontinale*, the Mount Hamilton Thistle (Figure 10).

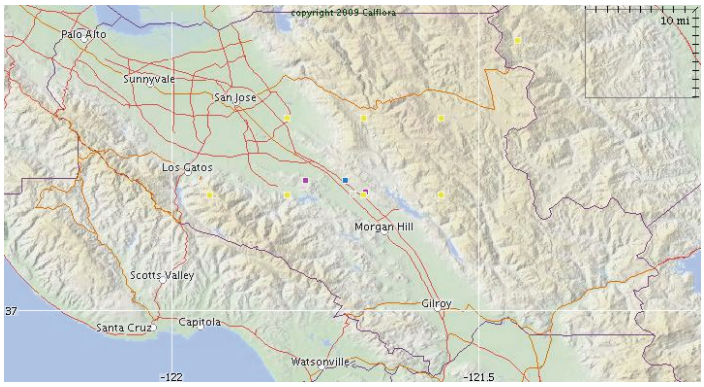

Figure 10. Mount Hamilton Thistle in the Coyote Valley region. Map courtesy of calflora.org

Results

Bird Results

Species Composition

In the study area 166 bird species were recorded through transects, point counts, Breeding Bird Atlas, and incidental observations (Table 2). This represents 43% of the total number of species recorded in Santa Clara County including vagrant species (accidental occurrence) as of 20 April 2005 (Bousman 2005). If vagrants are excluded this represents 57% of the species recorded in Santa Clara County. Of the 166 species recorded, 21 were raptors including a California rarity Crested Caracara (second county record, but the first documented with photographs) and a Harlan's Red-tailed Hawk. A tagged Bald Eagle, which was released on Santa Cruz Island in 2004 as part of restoration efforts, resided in Coyote Valley from September through December 2008.

Highest species diversity and abundance was most prominent in the Coyote Creek riparian corridor from March-October and in the agricultural fields in the northern portion of Coyote Valley surrounding Laguna and Richmond Avenues from November-February. Tulare Hill Ecological Reserve lacked species diversity, but held many serpentine and grassland specialists, including Rock Wren, Horned Lark, American Pipit, Burrowing Owl, Rufous-crowned Sparrow, and Say's Phoebe. The southern portion of Coyote Valley, which consisted mainly of the "green" belt zone was lacking species richness and diversity with the most common species being Rock Dove, House Sparrow, House Finch, European Starling, and Mourning Dove.

Table 2. Coyote Valley bird list from 26 December- 31 December 2008.

Western Grebe	American Avocet	Bewick's Wren
Eared Grebe	Greater Yellowlegs	Marsh Wren
Pied-billed Grebe	Common Snipe	House Wren
Brown Pelican SE/FE	Mew Gull	**Rock Wren 4**
American White Pelican BSSC	Ring-billed Gull	Wrentit
Double-crested Cormorant	California Gull	Ruby-crowned Kinglet
Great Blue Heron	Thayer's Gull	Western Bluebird
Great Egret	Herring Gull	American Robin
Snowy Egret	Western Gull	Hermit Thrush
Green Heron	Glaucous-winged Gull	Swainson's Thrush
Black-crowned Night-Heron	GlaucousxHerring Gull	Northern Mockingbird
American Bittern 4	Forster's Tern	California Thrasher
Canada Goose	Caspian Tern	European Starling
Cackling Goose	Mourning Dove	American Pipit
Greater White-fronted Goose	Rock Dove	Cedar Waxwing
Ross's Goose 4	Band-tailed Pigeon	Yellow-rumped Warbler
Snow Goose 4	White-throated Swift	Townsend's Warbler
Wood Duck	**Vaux's Swift 4 BSSC**	Orange-crowned Warbler
Mallard	Barn Owl	Yellow Warbler
Gadwall	**Short-eared Owl 4 BSSC**	Common Yellowthroat
Northern Pintail	Great-horned Owl	Wilson's Warbler
American Wigeon	Burrowing Owl BSSC/CS	**Yellow-breasted Chat 5 BSSC**
Northern Shoveler	Anna's Hummingbird	Western Tanager
Cinnamon Teal	Allen's Hummingbird	**Blue Grosbeak 4**
Canvasback	**Rufous Hummingbird 4**	Black-headed Grosbeak
Ring-necked Duck	Belted Kingfisher	Lazuli Bunting
Lesser Scaup	Acorn Woodpecker	Spotted Towhee
Greater Scaup	Downy Woodpecker	California Towhee
Common Goldeneye	Hairy Woodpecker	Rufous-crowned Sparrow
Bufflehead	Nuttall's Woodpecker	Savannah Sparrow
Hooded Merganser	Red-breasted Sapsucker	Golden-crowned Sparrow
Common Merganser	Northern Flicker	White-crowned Sparrow
Ruddy Duck	Pileated Woodpecker	**White-throated Sparrow 4**
Turkey Vulture	Pacific-slope Flycatcher	Fox Sparrow
Northern Harrier BSSC	Willow Flycatcher	Song Sparrow
White-tailed Kite FP	Western Wood-Pewee	Lincoln's Sparrow
Sharp-shinned Hawk	Black Phoebe	Lark Sparrow
Cooper's Hawk	Say's Phoebe	Dark-eyed Junco
Red-shouldered Hawk	**Cassin's Kingbird 5**	Western Meadowlark
Red-tailed Hawk	Western Kingbird	Brown-headed Cowbird
Harlan's Red-tailed Hawk	Ash-throated Flycatcher	Tricolored Blackbird BSSC
Swainson's Hawk 5 ST	Hutton's Vireo	Red-winged Blackbird
Ferruginous Hawk 4	Loggerhead Shrike BSSC	Brewer's Blackbird
Golden Eagle CS/FP	Warbling Vireo	**Great-tailed Grackle 5**
Bald Eagle 4 SE	Steller's Jay	Bullock's Oriole
Osprey 4	Western Scrub-Jay	Hooded Oriole
Crested Caracara 6	Yellow-billed Magpie	Purple Finch
Merlin	Common Raven	House Finch
American Kestrel	American Crow	Lesser Goldfinch
Prairie Falcon	Horned Lark	American Goldfinch
Peregrine Falcon SE	Northern Rough-winged Swallow	House Sparrow
California Quail	Tree Swallow	
Ring-necked Pheasant	Violet-green Swallow	
Wild Turkey	Cliff Swallow	bold with number = rarity(1-6)
American Coot	Barn Swallow	in red= special status species
Common Moorhen	Oak Titmouse	BSSC= Bird Species Special Concern
Sora	Chestnut-backed Chickadee	SE= State Endangered
Virginia Rail	Bushtit	ST= State Threatened
Killdeer	White-breasted Nuthatch	CS= Covered Species by HCP
Spotted Sandpiper	Brown Creeper	FP= Fed. Fully Protected

Special Status Species

Thirteen species of birds with special status in California (species of special concern, HCP covered species, state endangered, state threatened or federally fully protected) were recorded. These species included American White Pelican, Northern Harrier, White-tailed Kite, Swainson's Hawk, Golden Eagle, Bald Eagle, Peregrine Falcon, Vaux's Swift, Short-eared Owl, Burrowing Owl, Loggerhead Shrike, Yellow-breasted Chat, and Tricolored Blackbird. Only 2 species, White-tailed Kite and Loggerhead Shrike, were confirmed to breed within Coyote Valley. Seven White-tailed Kite nests and one Loggerhead Shrike nest were recorded, but evidence was observed of at least four pairs of Loggerhead Shrike breeding within the valley.

Figure 11: Juvenile Golden Eagle on Laguna Avenue. Photo taken by Ryan Phillips.

Other possible special status species breeding in Coyote Valley were Yellow-breasted Chat and Golden Eagle. In recent past years, a Golden Eagle nest was found to be active in the transmission towers to the west, approximately one mile from Coyote Valley. A pair of Golden Eagles actively foraging in Coyote Valley year round was observed, which could be the same pair or a second pair nesting in the Cinnabar Hills. At least one and possibly two Yellow-breasted Chats were actively singing in suitable breeding habitat for over four weeks from 28 April to 2 June. After 2 June no individuals or evidence of breeding were observed. They most likely vacated the area. All other special status species observed were either winter residents or transients passing through during migration.

Riparian Obligate Species

According to California Partners in Flight there are fourteen riparian obligate bird species of conservation concern found in California. These include: Swainson's Hawk, Yellow-billed Cuckoo, Willow Flycatcher, Bank Swallow, Swainson's Thrush, Bell's Vireo, Warbling Vireo, Yellow Warbler, Wilson's Warbler, Common Yellowthroat, Yellow-breasted Chat, Blue Grosbeak, Song Sparrow and Black-headed Grosbeak. Eleven of the fourteen obligate species have been observed on either Coyote or Fisher Creek. The three species that have not been observed in the riparian corridors within Coyote Valley are Yellow-billed Cuckoo, Bank Swallow and Bell's Vireo.

A single adult intermediate morph Swainson's Hawk was observed soaring over Coyote Creek at Coyote Ranch Road on 1 May, where it was first observed soaring north then circled and moved south out of view. This individual was most likely a transient, but breeding could occur within Santa Clara County as three nestlings were found in the county in June and July (Bousman 2007). Suitable breeding habitat exists along Coyote Creek in Coyote Valley with an abundance of mature California Sycamores (*Platanus racemosa*) and Fremont Cottonwoods (*Populus fremontii*) surrounded by agricultural fields.

Warbling Vireos have been recorded from April through September and breeding has been confirmed along Coyote Creek. The primary location within our study area where breeding Warbling Vireos occur is in the Coyote Ranch area. This species can be found throughout the riparian corridor, but only during migration. It is estimated that less than ten pairs breed along Coyote Creek.

In early September, during fall migration, two Willow Flycatchers were observed in the along Coyote Creek. This species is only found as a transient in the area and does not breed along Coyote Creek.

Yellow Warblers were recorded along the entire stretch of Coyote Creek from mid to late April through September. During both spring and fall migration abundance increased and numbers dropped post spring migration in late May and early June. No nests were located, but singing males holding territories were observed throughout the breeding season making them probable breeders along Coyote Creek.

Both Common Yellowthroat and Song Sparrow were the most common breeders along Coyote Creek with an estimated 200 breeding pairs of yellowthroats and 400 breeding pairs of Song Sparrows within our study area. Both are residents in Coyote Valley.

At least one (possibly two) Yellow-breasted Chats were observed singing on Coyote Creek adjacent to Coyote Ranch from 28 April to 2 June. This gave them a probable breeding status according to the BBA criteria, but no evidence of nesting was observed.

Wilson's Warblers were common during both spring and fall migration and only a few individuals were detected in June with none in July. This suggests that June individuals could have been breeders, but most likely were very late migrants. No evidence of nesting was observed.

Black-headed Grosbeaks were fairly common throughout the breeding season and breeding was confirmed along Coyote Creek in multiple locations. It was estimated that less then 50 pairs breed along Coyote Creek.

A single adult male Blue Grosbeak was observed calling along Fisher Creek on 7 July, which suggests that breeding occurs. However, no evidence of nesting was observed. If

breeding does occur in Coyote Valley this would be one of only a few locations in Santa Clara County (Bousman 2007). The only other known occurrence of this species in our study site was made by Stephen Rottenborn in 1994 who observed a singing male along Coyote Creek north of the Riverside Golf Course (Bousman 2007).

Breeding Status

The breeding status of species was identified following the Santa Clara County Breeding Bird Atlas protocol. One hundred-eight species were recorded with breeding status in Coyote Valley and confirmed breeding of 35 species with 44 probable, 19 possible and 10 observed (Table 3). Of the 35 confirmed breeders, two have special status, the Loggerhead Shrike and White-tailed Kite. For comparison, from 1987 to 1993, the Santa Clara County Breeding Bird Atlas surveys recorded 75 species with breeding status and confirmed breeding of 49 species in the Coyote Valley block, but that also included areas outside of our study area (Bousman 2007). However, 40 field hours were dedicated to this block in those seven years of surveys compared to our over 300 field hours in one year.

Active raptor nests were located within the study area, as well as habitat preference and relative nesting density. Forty active raptor nests of seven species were reported including, 12 Red-shouldered Hawk, 12 Red-tailed Hawk, 8 White-tailed Kite, 5 American Kestrel, 1 Cooper's Hawk, 1 Great Horned Owl, and 1 Turkey Vulture (Fig. 13). This resulted in a nesting density of one nesting pair per 1.2 km^2 (40 nesting pairs per 33 km^2) , which is comparable on a much smaller scale to the Snake River Bird of Prey National Conservation Area that holds the highest density of nesting raptors in the world (800 nesting pair per 1,964 km^2 = 1 nesting pair per .41 km^2).

Santa Clara County Rarities

In Santa Clara County a rarity system has been developed on a scale of 1 to 6 with a one being the most common and six being the rarest (Bousman and Smith 2009). The 6's are species that have only been one or a few records in the county. Twelve 4's, four 5's and one 6 were recorded. The 4's were American Bittern, Ross's Goose, Snow Goose, Ferruginous Hawk, Bald Eagle, Osprey, Vaux's Swift, Short-eared Owl, Rufous Hummingbird, Rock Wren, Blue Grosbeak, and White-throated Sparrow. The four 5's were Swainson's Hawk, Cassin's Kingbird, Yellow-breasted Chat, and Great-tailed Grackle, and the only 6 being a second county record of Crested Caracara.

Table 3. Breeding birds observed throughout Coyote Valley in 2008.

Observed	Possible	Probable	Confirmed
Ruddy Duck Double-crested Cormorant Snowy Egret Black-crowned Night-Heron Black-necked Stilt Caspian Tern Forster's Tern Ruby-crowned Kinglet	Ring-necked Pheasant Wild Turkey American Bittern Great Blue Heron Great Egret Common Moorhen Spotted Sandpiper Belted Kingfisher Acorn Woodpecker Western Wood-Pewee Hutton's Vireo Swainson's Thrush Orange-crowned Warbler Wilson's Warbler Lark Sparrow Dark-eyed Junco Blue Grosbeak Tricolored Blackbird Purple Finch	Gadwall Cinnamon Teal Common Merganser Pied-billed Grebe Green Heron Osprey Northern Harrier Golden Eagle American Coot Killdeer Rock Pigeon Mourning Dove Barn Owl White-throated Swift Nuttall's Woodpecker Downy Woodpecker Northern Flicker Pacific-slope Flycatcher Ash-throated Flycatcher Steller's Jay Yellow-billed Magpie Horned Lark Tree Swallow Violet-green Swallow Barn Swallow Chestnut-backed Chickadee Oak Titmouse Rock Wren Bewick's Wren House Wren Western Bluebird American Robin Wrentit California Thrasher Yellow Warbler Common Yellowthroat Yellow-breasted Chat Spotted Towhee California Towhee Black-headed Grosbeak Western Meadowlark Brown-headed Cowbird Lesser Goldfinch American Goldfinch	Canada Goose Wood Duck Mallard California Quail Turkey Vulture White-tailed Kite Cooper's Hawk Red-shouldered Hawk Red-tailed Hawk American Kestrel Great Horned Owl Anna's Hummingbird Black Phoebe Western Kingbird Loggerhead Shrike Warbling Vireo Western Scrub-jay American Crow Common Raven N. Rough-winged Swallow Cliff Swallow Bushtit White-breasted Nuthatch Marsh Wren Northern Mockingbird European Starling Rufous-crowned Sparrow Song Sparrow Red-winged Blackbird Brewer's Blackbird Great-tailed Grackle Hooded Oriole Bullock's Oriole House Finch House Sparrow

Mammal Results

Twenty-four mammal species have been identified within the study area (Table 4). A total of 1,787 animal detections have been recorded throughout the study site. A total of 877 animal detections have been recorded along the tracking transect throughout the study period, along with 910 animal detections recorded at the camera-trap stations.

Table 4. Total Number of Mammals Identified by Track Transects in Coyote Valley in 2008

Common Name	Scientific Name	Sensitive Species
1) Pallid bat	(*Antrozous pallidus*)	CA Species of Special concern
2) Red fox	(*Vulpes vulpes*)	
3) Gray fox	(*Urocyon cinereoargenteus*)	
4) Coyote	(*Canis latrans*)	
5) Bobcat	(*Lynx rufus*)	
6) Mountain lion	(*Puma concolor*)	
7) Domestic house cat	(*Felis catus*)	
8) Raccoon	(*Procyon lotor*)	
9) North American Badger	*(Taxidea taxus)*	CA Species of Special Concern
10) California ground squirrel	*(Spermophilus beecheyi)*	
11) Eastern fox squirrel	(*Sciurus niger*)	
12) Western harvest mouse	(*Reithrodontomys megalotis*)	
13) Deer mouse	*(Peromyscus maniculatus)*	
14) Dusky-footed woodrat	(*Neotoma fuscipes*)	CA Species of Special Concern
15) Norway rat	*(Rattus norvegicus)*	
16) Black rat	*(Rattus rattus)*	
17) Muskrat	(*Ondatra zibethicus*)	
18) Virginia opossum	(*Didelphis virginiana*)	
19) Audubon's cottontail	(*Sylvilagus audubonii*)	
20) Black-tailed jackrabbit	(*Lepus californicus*)	
21) Black-tailed deer	(*Odocoileus hemionus columbianus*)	
22) Tule elk	(*Cervus elapus nannodes*)	
23) Wild boar	(*Sus scrofa*)	
24) Striped skunk	*(Mephitis mephitis*)	

Table 5. Total numbers of mammal tracks recorded by species

Coyote Valley Mammal Data Numbers	
SPECIES RECORDED IN CV:	**# of Animals in 2007/2008**
Badger	1
Bat	1
Black rat	5
Black-tailed deer	82
Black-tailed jackrabbit	4
Bobcat	2
Brush rabbit	109
California ground squirrel	56
Coyote	332
Deer mouse	5
Eastern gray squirrel	2
Unknown subspecies of Fox	15
Gopher	1
Gray fox	5
Harvest mouse	2
Mountain lion	26
Mouse	6
Opossum	3
Pocket gopher	6
Rabbit	16
Raccoon	94
Unknown Rat subspecies	1
Red fox	1
Skunk	1
Squirrel	3
Tree squirrel	1
Ungulate	7
Vole	1
Western harvest mouse	1
Wild pig	21
Dusky-footed woodrat	25
TOTAL	**877**

Multiple species tracks, scats or live sightings were identified in the Coyote Creek County Park and the valley floor. More than 60% of the tracks, were heading in the east and west directions throughout the study site. Coyote Valley contains a high diversity of wildlife (Figure 12). Multiple species such as bobcat, coyote, and deer have been tracked from Coyote Creek habitat along Bailey Road to the Fisher Creek culvert and IBM.

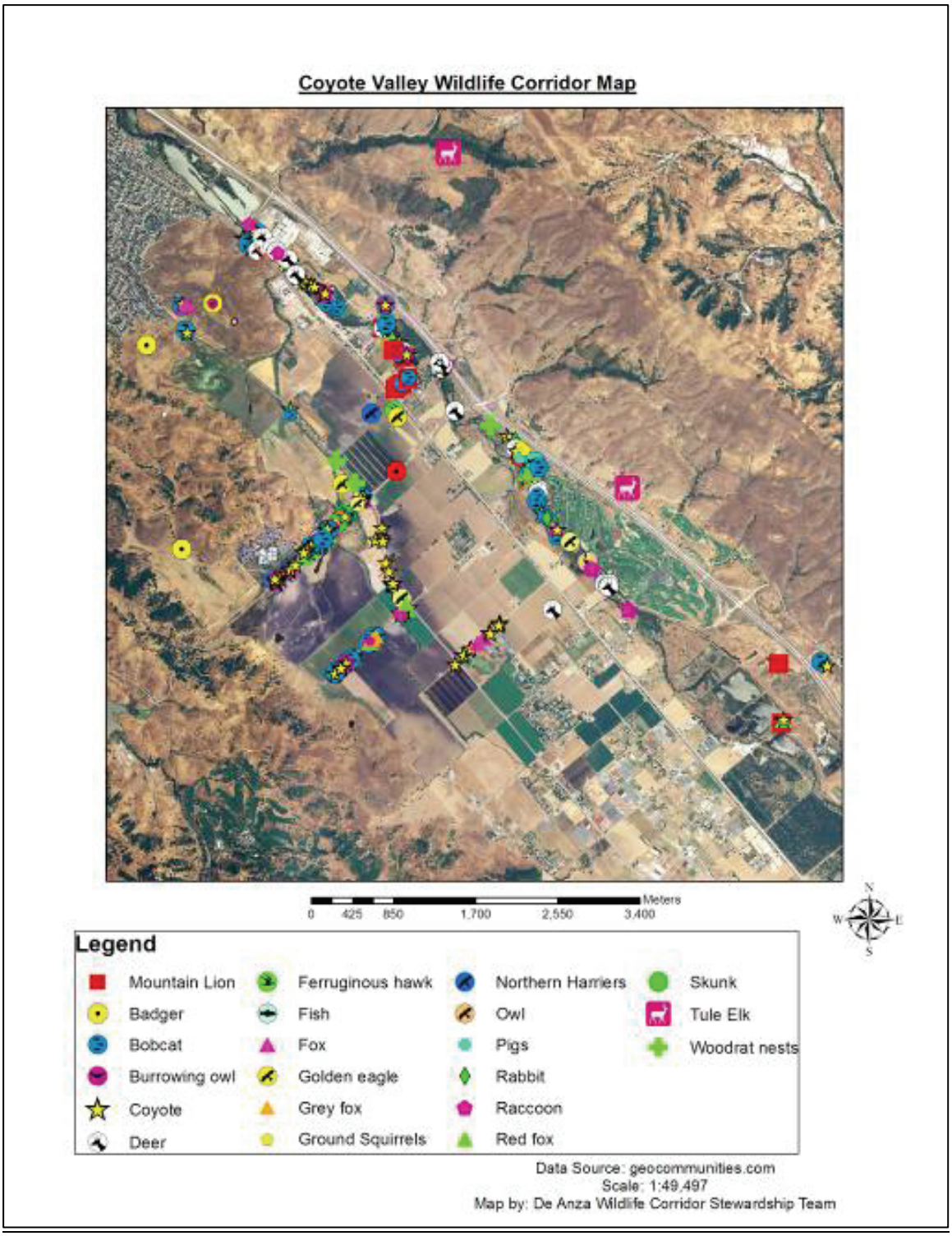

Figure 12. Wildlife Survey Data mapped out in ArcView 9.1

Wildlife has been recorded crossing Bailey Road and Santa Teresa Boulevard into adjacent agricultural fields. Multiple species were identified traveling along both Laguna Road and Richmond Road in all directions, including in and out of agricultural fields (Figure 13).

Figure 13. Laguna Avenue: multiple species tracks including bobcat, coyote and raccoon

Colored flags were used to indicate different species recorded traveling along Laguna Road (Figure 14). The orange flags represent bobcat tracks, the yellow flags represent coyote tracks and the blue flags identify raccoon tracks along Laguna Avenue (Figure 15) and Bailey Avenue (Figure 16).

Figure 14. Flags representing multiple species use of valley floor along Laguna Avenue

Figure 15. Flags representing multiple species use of valley floor along Laguna Avenue

Figure 16. Flags representing multiple species use of valley floor along Bailey Avenue

Over a nine month period over 400 data points (photo images) of animals were collected using remote field cameras along the Highway 101 culverts (Figure 17). These Highway 101 corridor culverts were identified and labeled by the California Department of Fish and Game. Seven of the culverts were monitored for wildlife use while 19 have not yet been monitored. Further culvert surveys will be conducted to identify species use, along with temporal and spatial analysis.

These data points from these 7 culverts were used to develop an initial connectivity map for the Highway 101 corridor (see Figure 12). This analysis demonstrates that wildlife species are using at least these seven monitored Highway 101 culverts to move from east to west and west to east.

The initial study indicates that the Highway 101 culvert corridor is permeable for wildlife, facilitating species movement from the east hills (such as Coyote Ridge and

including the Mt. Hamilton region of the Diablo Range) under Highway 101 to access Coyote Creek in Coyote Valley and surrounding hills.

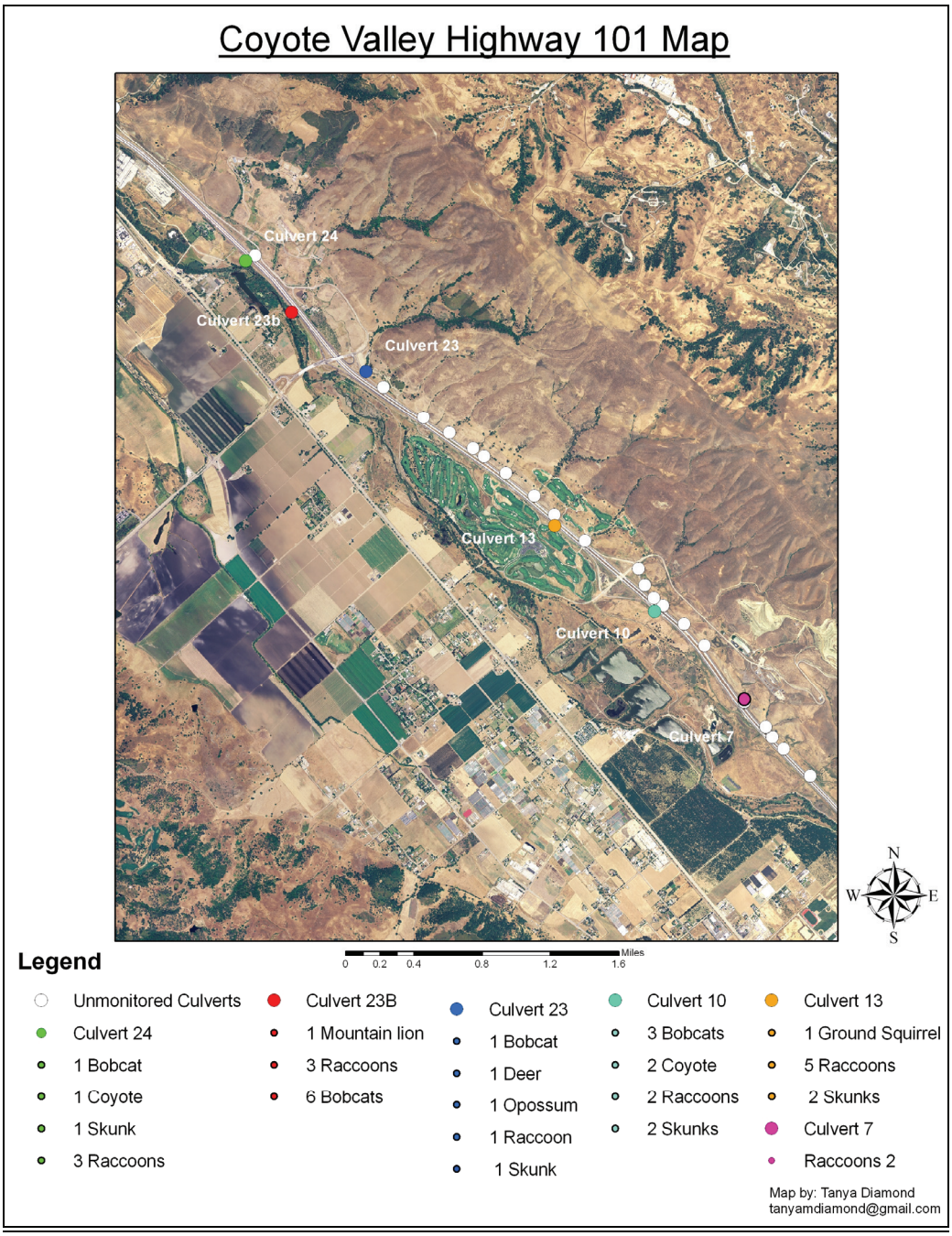

Figure 17. Coyote Valley Highway 101 Culvert Map

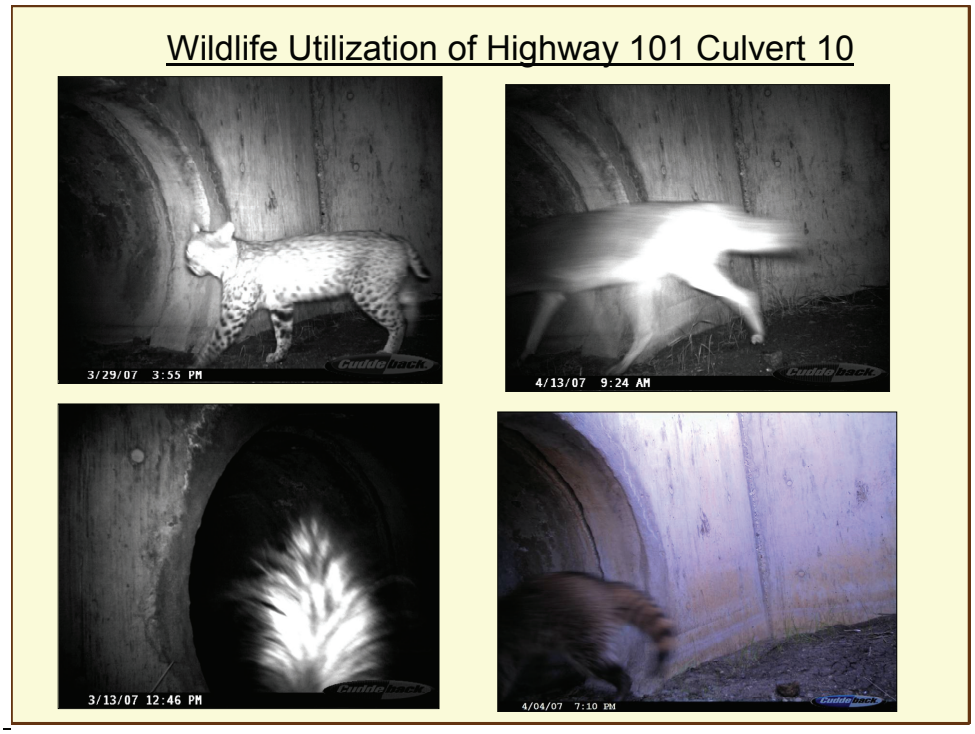

Figure 18. Multiple species use of Highway 101 Culvert 10

Figure 18 shows one culvert used by multiple species use within a one month surveillance period. During March 2007, one bobcat, coyote, raccoon, and skunk used this culvert. Next steps will include a spatial and temporal analyses of the data collected of these animals using the culvert. Currently other culverts along 101 are being monitored as well.

Fifty-four active ground squirrel burrows were recorded along a transect on Bailey Avenue (Figure 19). Each burrow was measured, recorded, and photographed (Long et al. 2008). The initial survey indicates that Coyote Valley provides critical habitat for California ground squirrels, which benefits the resident North American badgers and raptors such as the Golden Eagle.

Figure 19. Flags marking ground squirrel burrows along Bailey Avenue

The dusky -footed Woodrat, mule deer, coyote, and bobcat have been found traveling in and out of the Sobrato fields through the Fisher Creek culvert located under Bailey Avenue in the midsection of Coyote Valley (Figure 20).

Figure 20. Fisher Creek culvert at Bailey road

Two male mule deer were recorded using the Fisher Creek culvert (Figure 21) heading both east and west within a two week period. Fisher Creek is a box culvert and it is rare for deer to travel through box culverts of this dimensions (Beier, pers comm., Ruediger and DiGiorgio 2007). Five bobcats were also recorded using the same culvert (Figure 22). Fisher Creek and this culvert are critical in facilitating the safe passage of wildlife throughout the valley as it is the only riparian creek running through the midsection of Coyote Valley.

Figure 21. Fisher Creek culvert deer #1 on 6-1-08 Fisher Creek culvert deer #2 5-14-08 2:21

Figure 22. Fisher Creek culvert bobcat #2: 7-24-08 Fisher Creek culvert bobcat #5: 9-24-08

Individual Species Maps

Mountain Lion (*Felis concolor*)

Figure 23 shows the seven mountain lion observations collected in Coyote Valley. In March 2008, a mountain lion data point was confirmed by Santa Clara Animal Control as juvenile male, hit southbound on Highway 101. There are two culverts, culvert 23b and 24, large enough for mountain lions to move through on the south and north location of this road kill site. It is recommended that wildlife proof fencing be used to guide animals to these culvert locations. Santa Clara County Park Rangers also confirmed that a female mountain lion with a juvenile were observed July 2007 in the south end of Coyote Creek County Park near the Model Aircraft Park.

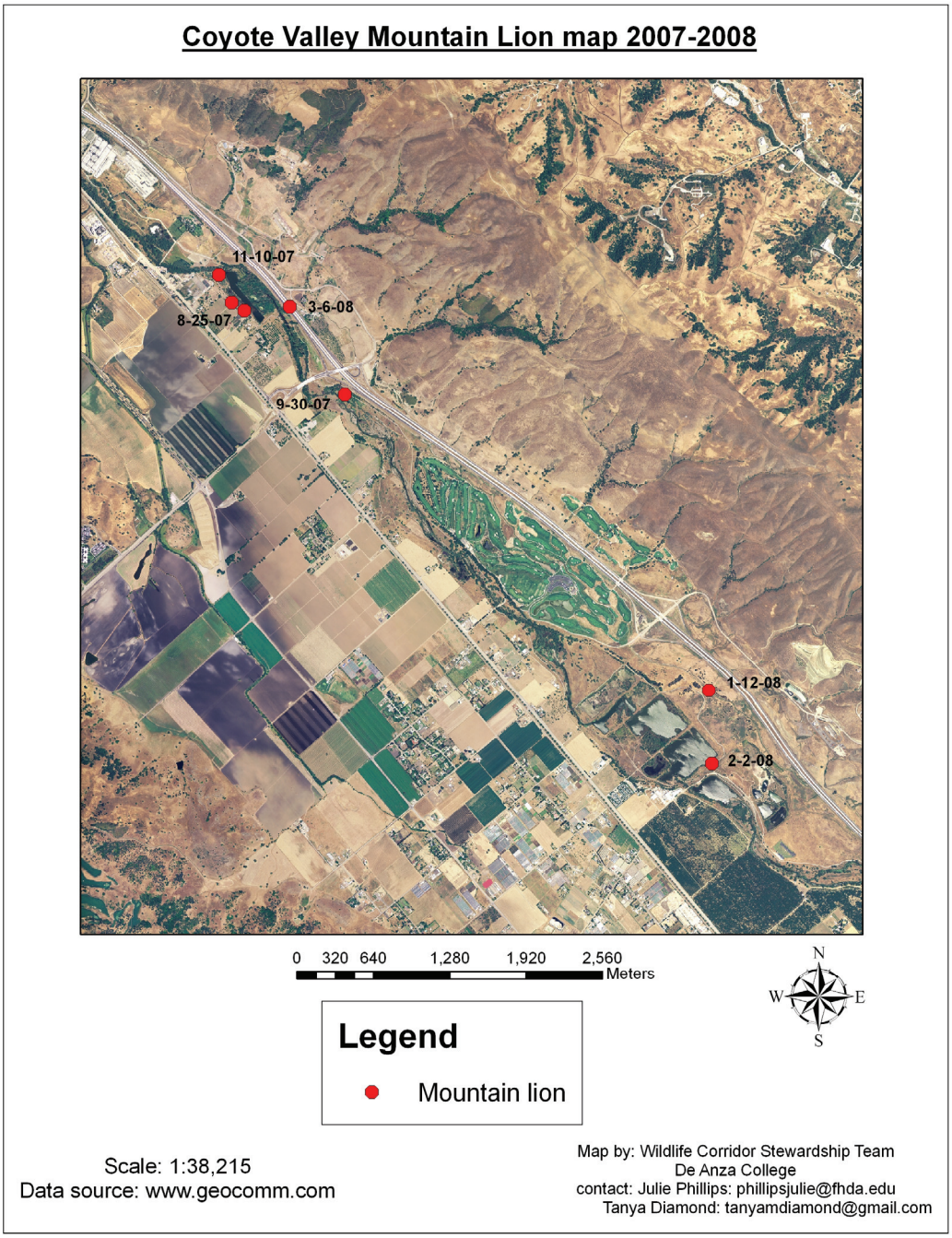

Figure 23. Mountain lion observations in Coyote Valley

Bobcat (*Felis rufus*)

Figure 24 shows twenty five bobcat locations recorded throughout Coyote Valley. The direction of each bobcat track was recorded, along with a photo. Many of the tracks recorded were coming in and out of agricultural fields, as well as traveling along the roads.

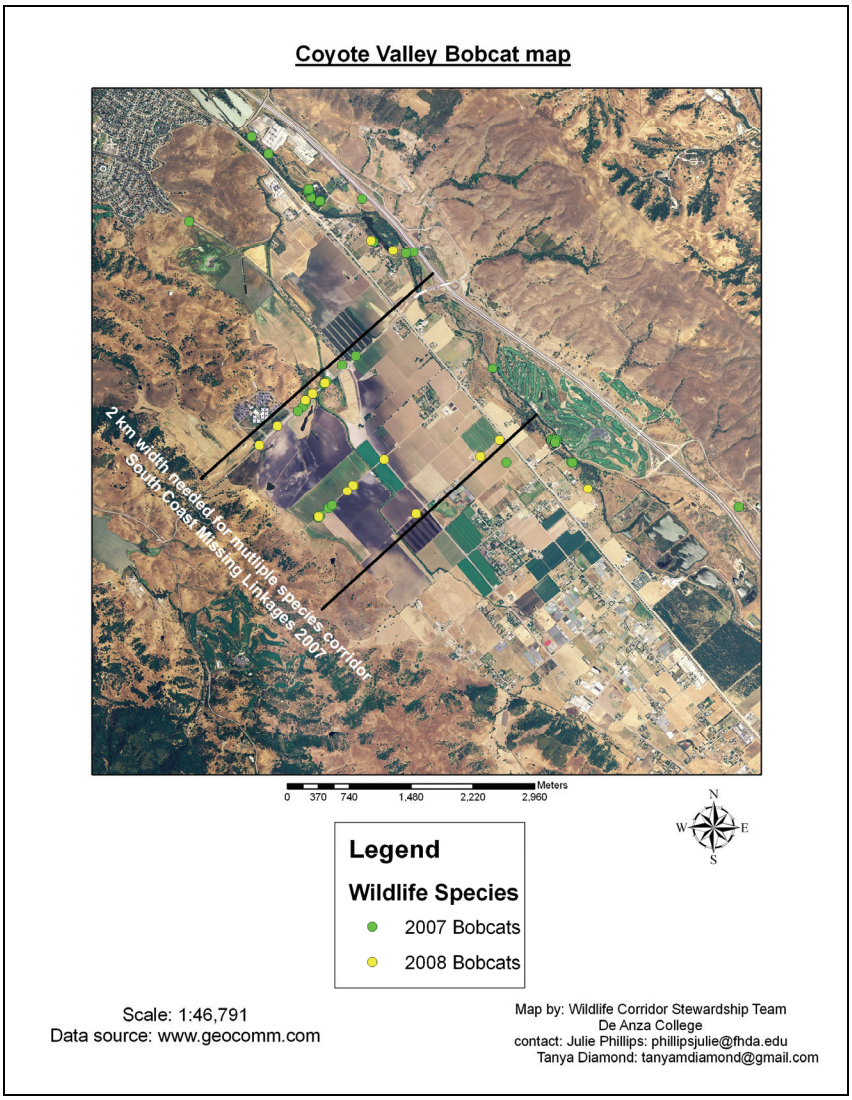

Figure 24. Bobcat observations in Coyote Valley

Dusky-footed Woodrat (*Neotoma fuscipes*)

Seven Dusky-footed woodrat nests were located along Bailey Avenue and Santa Teresa Boulevard. The woodrat nests were located approximately 6 to 10 feet above the ground in oak trees (Figure 25). Dusky-footed woodrats typically have stick nests at the base of trees. However, they will nest in areas that are floodplains and periodically flood (Matson, J pers comm. 2008).

Figure 25. Coyote Valley Dusky-footed woodrat locations

Corridor Width

Figure 24 represents the corridor identified as critical linkage, based on the high use and frequency of wildlife movement throughout the area. The corridor width, 2 km, was determined in the South Coast Missing Linkages 2007 report, which states a multi-species wildlife corridor needs to be at minimum 2 km wide (Penrod et al. 2006). The report also states, "For a variety of species, including those we did not formally model, a wide linkage helps ensure availability of appropriate habitat, host plants (e.g., for butterflies), pollinators, and areas with low predation risk. In addition, fires and floods are part of the natural disturbance regime and a wide linkage allows for a semblance of these natural disturbances to operate with minimal constraints from adjacent urban areas. A wide linkage should also enhance the ability of the biota to respond to climate change and buffer against edge effects" (Penrod et al. 2006). The current width of Coyote Valley is 1.9 km. Losing any additional habitat within the valley would result in decreased functionality of the corridor for multiple species.

Female mountain lions can have a home range of up to 20 km^2. Immature individuals must disperse from their natal home range to establish their own home range (Beier 1993). This requires large amounts of habitat to facilitate dispersal of immature mountain lions, especially to avoid moving through another male's territory (Beier 1993).

North American badger (*Taxidea taxus taxus*)

Between 2006 and 2008, there were ten badger observations in the Coyote Valley study area (Figure 26). These observations documented different habitat use by this subspecies than previously observed in this region in the literature.

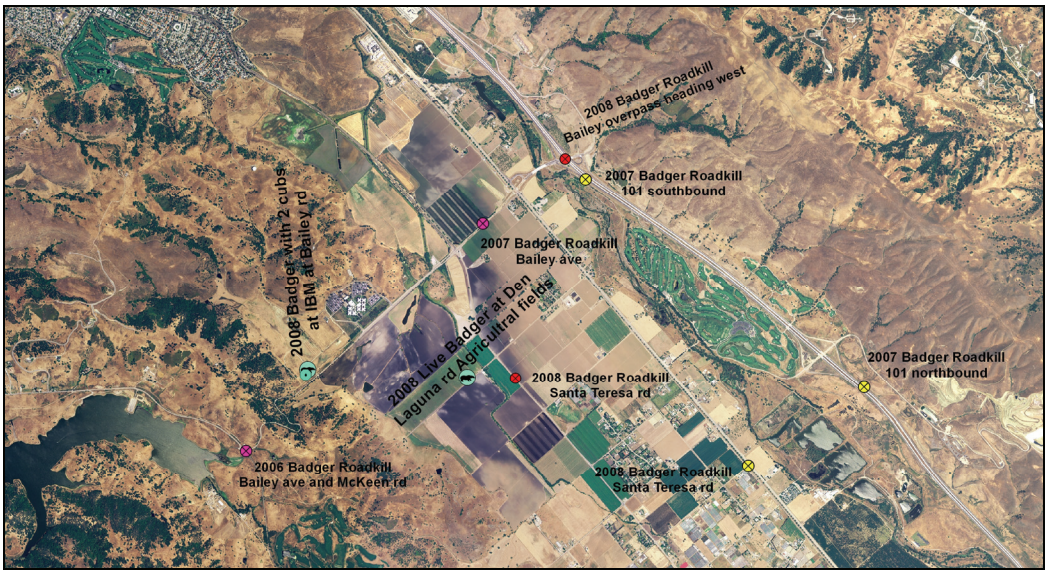

Figure 26. North American badger observations: 2006-2008

From 2006 to 2008, badgers have been documented breeding and raising cubs 500 m away from the study site on the IBM property (Figure 27).

Figure 27. Two North American badgers on IBM habitat 11 May 2008. Photo by Rick Mandel

On 29 June 2007, a road-killed badger was found on Bailey Avenue, between Monterey Highway and Santa Teresa Boulevard (Figure 28). The badger was located at the north side of Bailey Avenue, adjacent to agricultural fields by Tulare Hill Ecological Reserve. This badger was a juvenile, most likely dispersing out of a parental home range. Last year, a badger natal den was identified at Tulare Hill Ecological Preserve and on the IBM property. Other research has also documented that badgers will travel through agricultural fields (DFG Resource Assessment Program, Project Report draft 2009).

There have been three reported badger road kills along this Monterey Highway due to badgers becoming trapped along the divider (Santa Clara Vector Control, pers comm 2007).

Figure 28. North American badger on Bailey Road 6/19/07.

On 23 June 2008, a road-killed badger was found on the Bailey/Highway 101 Overpass (Figure 29).

Figure 29. North American badger road kill on Bailey/Highway 101 Overpass, 6/23/089.
Photo courtesy of Angela Boyle.

On 25 August 2008, a badger was documented along Laguna Road in the agricultural fields (Figure 30). This badger was then observed retreating into a burrow in a colony of ground squirrels.

Figure 30. North American badger along Laguna Road

On 6 September 2008, a badger was found dead along Santa Teresa Road between agricultural fields (Figure 31a and 31b) and was within 500 m of the individual observed on Laguna Avenue a week prior. It was identified as a different individual than the Laguna Avenue individual based on facial markings.

Figures 31a, b. 9-6- 2008: Road killed badger along Santa Teresa Blvd. between Laguna Road and Richmond Road. Photos taken by the De Anza Wildlife Corridor Stewardship Team.

North American badgers, *Taxidea taxus taxus*, are listed as a Species of Special Concern in California. Badgers have also been listed as an indictor species for connectivity within Santa Clara County by the Santa Clara Habitat Conservation Plan.

Badgers exist in small populations but have large home ranges of up to 20km² (Quinn 2008). Badgers must be able to access other badger home ranges to find mates. It has been shown that corridors can facilitate the movement of this species through habitat patches by providing connectivity (Hilty *et al* 2006). Connectivity between habitat patches is critical to maintain genetic viability and maintain viable populations of wildlife (Noss 1987, Buza et al 2000). Wildlife corridors facilitate the movement for wildlife species to find mates, resources, and for juveniles to disperse out of their parental home range (Beier 1993).

Badgers are very sensitive to human development and require large grassland habitats to maintain viable populations (Crooks 2002). The habitat at IBM and Tulare Hill Ecological Preserve has been found to be a critical stepping stone for badger movement from the east to west hills as well as critical habitat for them (corridor analyses conducted by Tanya Diamond, Masters Thesis work in progress).

Badgers are also present at Santa Teresa County Park and Calero County Park. Badger corridors need to be at least 1.8 km wide, the average badger home range size from studies within the US (Sargeant & Warner 1972; Lampe & Sovada 1981; Messick & Hornocker 1981; Goodrich & Buskirk 1998, Minta 1993; Quinn current thesis work).

A habitat suitability map was created for the counties of Santa Clara, San Mateo, Santa Cruz, and Monterey (Figure 32) (Diamond, Masters Thesis work in progress). Of the four counties, Santa Clara County has the largest amount of highly suitable badger habitat

and the least amount of habitat fragmentation. Each badger observed in the Santa Clara County study was recorded in highly suitable habitat for badgers (Diamond, Masters Thesis work in progress).

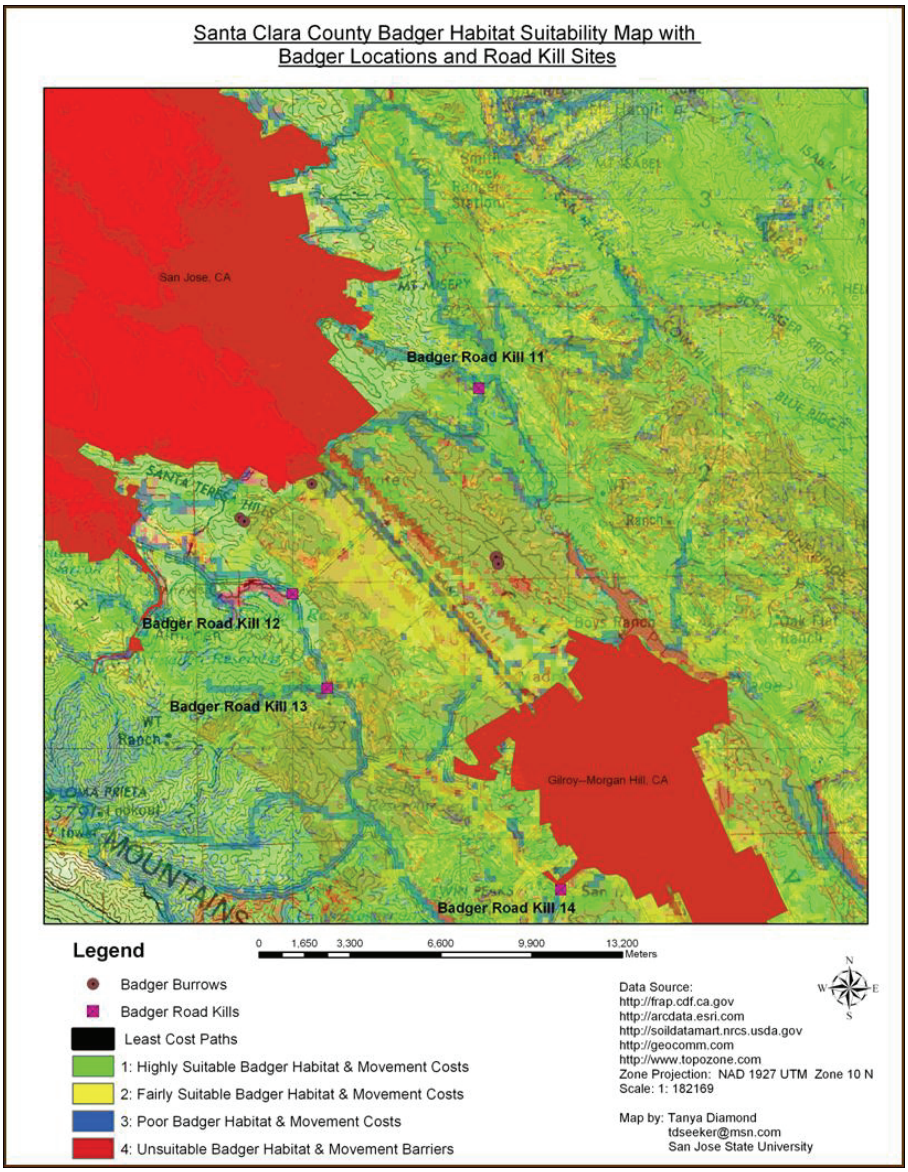

Figure 32. Santa Clara County North American badger habitat suitability map

Badgers are susceptible to road mortality from cars because they have poor vision, are nocturnal, and tend to travel by olfactory cues (Minta 1993). Several studies have shown that road mortality is a severe threat for badgers (Minta 1993, Messick and Hornocker 1981). In an Idaho badger study, 59% of 157 mortalities were due to road kill (Messick and Hornocker 1981). A British Columbia badger study stated that road mortality was highly significant; 5 out of 7 mortalities were due to road kills (Hoodicoff 1998).

High use roads and highways often bisect badger home range because roads are located in valley floors with surrounding sloping hills which funnels badgers through the valley floors (Diamond, Masters Thesis work in progress). In addition, high volume roads often have median dividers, which are hazardous because badgers tend to get trapped at medians because they are too high for badgers to cross. Any increase in traffic along the Monterey Highway will result in higher badger mortality.

Road mortality increases during the summer breeding months because of increased movement by males to locate females, tripling their home range size (Minta 1993). Juvenile badgers also leave their natal home ranges to establish their own territory.

In fragmented landscapes, badgers must often travel across high use roads. For example at Tulare Hill Ecological Preserve, Santa Clara County, there was a natal den in the summer of 2006. Tulare Hill Ecological Reserve is large enough to support the home range of one resident badger. The hill is surrounded by high use roads. Since 2006, there have been five reported badger road kills within the immediate location of the hill (Santa Clara Animal Control, Santa Clara County Parks pers com). Monterey Highway, adjacent to Tulare Hill, has a high median, over 5 ft, which a badger could not cross over.

Plant Results

Of the 124 plant species identified, 42 were introduced species and one was a special status species, *Cirsium fontinale* var. *campylon*, the Mount Hamilton Thistle, a candidate species for listing on the federal endangered species list typically found in seeps and drainages in Coyote Creek County Park and the adjacent base of Coyote Ridge.

Table 6. Floral Checklist of Coyote Valley
(Nomenclature according to Jepson, 1993 and www.Calflora.org)

FERNS and FERN ALLIES	**Common Name**
DENNSTAEDTIACEAE	
Pteridium aquilinum var. *pubescens??*	Bracken Fern
FLOWERING PLANTS – DICOTS	**Common Name**
ADOXACEAE	
Sambucus mexicana (Caprifoliaceae)	Blue Elderberry
ANACARDIACEAE	
Schinus molle^	Peruvian Pepper Tree
Toxicodendron diversilobum	Poison Oak
APIACEAE	
Conium maculatum[A]*	Poison-Hemlock
Foeniculum vulgare[A]*	Fennel
Scandix pectin-veneris[A]	Shepherd's Needle
Torilis arvensis[A]	Hedge-Parsley

ASCLEPIADACEAE	
Asclepias fascicularis	Narrowleaf Milkweed
ASTERACEAE	
Achillea millefolium	Yarrow
Artemisia californica	California Sagebrush
Artemisia douglasiana	California, Douglas Mugwort
Baccharis pilularis	Coyote Brush
Baccharis salicifolia	Mule Fat, Seep Willow
Carduus pycnocephalus[A]*	Italian Thistle
Centaurea melitensis[A]*	Tocolate
Centaurea solstitialis[A]*	Yellow Star Thistle
Chicorium intybus[A]	Chicory
Cirsium vulgare[A]*	Bull Thistle
Cirsium fontanale ssp. fontanale[R]	Mt. Hamilton Thistle
Cyanara scolymus^	Artichoke
Hypochaeris glabra[A]*	Cat's Ear
Lactuca serriola^*	Prickly Lettuce
Microseris douglasiana	Douglas' Microseris
Picris echioides^*	Ox-tongue
Silybum marianum[A]*	Milk Thistle
Tragopogon dubius	Yellow Salsify
BORAGINACEAE	
Amsinckia sp	Rancher's Fireweed
Cryptantha sp.	Cryptantha
BRASSICACEAE	
Barbarea verna[A]	Early Winter Cress
Brassica nigra[A]*	Black Mustard
Capsella bursa- pastoris[A]	Shepherd's Purse
Raphanus sativus[A]*	Wild Radish
Rorippa sp.	Cress
CARYOPHYLLACEAE	
Stellaria media[A]	Common Chickweed
CAPRIFOLIACEAE	
Symphoricarpos mollis	Creeping Snowberry
CONVOLVULACEAE	
Calystegia purpurata ssp. *purpurata*	Morning Glory
Convolvulus arvensis[A]*	Field Bindweed
CRASSULACEAE	
Crassula aquatica	Pygmy Weed
Dudleya sp	Canyon Liveforever
CUCURBITACEAE	
Marah sp.	Wild Cucumber
DIPSACACEAE	
Dipsacus sp.[A]*	Teasel
EUPHORBIACEAE	

Eremocarpus setigerus	Doveweed
FABACEAE	
Lupinus microcarpus (purple)	Annual, Miniature Lupine
Medicago polymorpha[A]*	Burclover
Melilotus indica	Sour Clover
Thermopsis macrophylla var.?	Yellow False Lupine
Trifolium hirta	Rose Clover
Vicia sativa ssp. *sativa*[A]	Vetch
Vicia villosa ssp. villosa[A]*	Hairy Vetch
FAGACEAE	
Quercus agrifolia	Coast Live Oak
Quercus douglasii	Blue Oak
Quercus lobata	Valley Oak
GERANIACEAE	
Erodium botrys[A]*	Long-Beaked Filaree
Erodium brachycarpum[A]*	Short-Beaked Filaree
Erodium cicutarium[A]*	Red-Stemmed Filaree
Geranium dissectum[A]*	Cut-Leaved Geranium
GROSSULARACEAE	
Ribes sp.	Gooseberry
HIPPOCASTANACEAE	
Aesculus californica	California Buckeye
JUGLANDACEAE	
Juglans californica	Northern California Black Walnut
LAMIACEAE	
Lamium amplexicaule^	Henbit
Marrubiam vulgare^	Horehound
Stachys sp.	Hedge Nettle
LAURACEAE	
U*mbellularia californica*	California Bay Laurel
MYRTACEAE	
Eucalytus sp.	Eucalyptus
ONAGRACEAE	
Epilobium ciliatum	Common Willowherb
OROBANCHACEAE	
Castilleja exserta ssp. *exserta*	Purple Owl's Clover
Orobanche fasciculata	Broomrape
PAPAVERACEAE	
Eschscholtzia californica	California Poppy
Platystemon californicus	Cream Cups

PHRYMACEAE	
Mimulus aurantiacus	Sticky Monkeyflower
Mimulus guttatus	Common Monkeyflower
PLANTAGINACEAE	
Plantago erecta	Dwarf Plantain
Plantago lanceolata[A]	English Plantain
PLATANACEAE	
Platanus racemosa	California Sycamore
POLEMONIACEAE	
Gilia tricolor	Bird's-Eye Gilia
POLYGONACEAE	
Eriogonum sp.	Buckwheat
Rumex acetosella[A]*	Dock
Rumex conglomerata[A]	Dock
Rumex crispus[A]*	Dock
PRIMULACEAE	
Anagallis arvensis[A]	Scarlet Pimpernel
RHAMNACEAE	
Rhamnus californica	California Coffeeberry
ROSACEAE	
Prunus sp.	Domestic Fruit Tree
Rosa californica	California Rose
Rubus discolor	Himalayan Blackberry
Rubus ursinus	California Blackberry
RUBIACEAE	
Galium porrigens	Climbing Bedstraw
SALICACEAE	
Populus fremontii	Alamo or Fremont Cottonwood
Salix exigua	Narrow-Leaved Willow
Salix laevigata	Red Willow
SCROPHULARIACEAE	
Verbascum sp.	Mullein
SOLANACEAE	
Nicotiana glauca^	Tree Tobacco
Solanum sp.	Blue Nightshade
URTICACEAE	
Urtica dioica^	Stinging Nettle
VISCACEAE	
Phoradendron villosum	Oak Mistletoe
FLOWERING PLANTS – MONOCOTS	**Common Name**

CYPERACEAE	
Eleocharis macrostachya	Spikerush
JUNCACEAE	
Juncus patens	Common Rush
LEMNACEAE	
Lemna sp	Duckweed
LILIACEAE	
Allium sp.	Onion
Calochortus venustus	White Mariposa Lily
Chlorogalum pomeridianum	Common Soap Plant, Amole
Dichelostemma sp.	Blue Dicks
Triteleia laxa	Ithuriel's Spear
POACEAE	
Aira caryophyllea[A]*	European Hairgrass
Arundo donax	Giant Reed
Avena barbata[A]*	Slender Wild Oat
Bromus diandrus[A]*	Ripgut Grass
Bromus hordeaceus[A]*	Soft Chess
Bromus madritensis ssp. rubens[A]	Foxtail Chess
Bromus tectorum[A]*	Cheat Grass, Downy Brome
Elymus glaucus	Blue Wild Rye
Gastridium ventricosum[A]	Nit Grass
Hordeum brachyantherum	Meadow Barley
Hordeum marinum spp. gussoneanum[A]	Mediterranean Barley
Koeleria macrantha	June Grass
Lamarckia aurea[A]	Golden Top
Leymus triticoides	Creeping Wild Rye
Lolium multiflorum[A]*	Italian Ryegrass
Nasella pulchra	Purple Needlegrass
Phalaris aquatica[A]*	Harding Grass
Piptatherum miliaceum	Smilo Grass
Poa annua[A]	Annual Blue Grass
TYPHACEAE	
Typha sp.	Cattail

KEY
A Introduced species.
* Noxious weed (based on CAL-IPC)
R Rare

Conclusion

The results in this report represent a set of baseline data for the flora and fauna throughout Coyote Valley. Coyote Valley is one of two connectivity points between the Diablo Range and the Santa Cruz Mountains, the other being through the Pajaro River Basin, and is the only linkage with a direct connection between the two. This is the first full scale study conducted in Coyote Valley with an emphasis on connectivity and the effects of Highway 101 and other roads on wildlife movement. If Coyote Valley is developed, the linkage will be lost and species in the Santa Cruz Mountains with large home ranges such as the mountain lion (*Puma concolor*) and the North American badger (*Taxidea taxus taxus*) will be genetically isolated and local extinction may occur (P. Beier pers. comm.2009, Diamond in press).

Our research demonstrates that Highway 101 through Coyote Valley is permeable to wildlife movement with two overpasses (Bailey Avenue and Metcalf Road), three underpasses (Coyote Creek, Golf Course Drive and Coyote Creek Golf Course cart path) and twenty-seven culverts.

Recommendations include the addition of directional fencing, the removal of already present fencing, restoration and enhancement of vegetation and riparian corridors, and additional crossing structures, would result in increased permeability across the landscape for wildlife across the valley floor. In addition, this would result in a reduction in the frequency and number of wildlife/human vehicle collisions.

Recommendations include culvert modifications such as removal of fencing which can be a barrier to wildlife movement. This would include more vegetation along the culverts to enhance habitat for species movement.

Recommendations include multiple new crossing structures for wildlife over Highway 101, Monterey Highway, Bailey Avenue, and Santa Teresa Boulevard. An additional crossing structure is recommended just south of Golf Course Drive and north of the Ogier Ponds, connecting Coyote Creek County Park and Coyote Ridge Ecological Reserve. This location is ideal for a crossing structure as both lands are protected and are high-use areas by wildlife.

Recommendations include modifications to the center divider on Monterey Highway at Metcalf Road and Live Oak Road to enhance wildlife movement and reduce wildlife/human vehicle collisions. The roads and highways within Coyote Valley must continue to be assessed for permeability for wildlife movement.

This annual report, including our recommendations, is a part of a long-term monitoring program at De Anza College. This research has been cited in the second administrative draft of Santa Clara County's Habitat Conservation Plan.

The De Anza College monitoring program will continue this research, including the mammal and avian surveys, through remote-sensor camera trapping, strip-line transects, variable plot point-counts, raptor nest mapping and Breeding Bird Atlas. We will conduct additional vegetation and amphibian surveys throughout Coyote Valley.

This long-term research effort will guarantee a better understanding of the Coyote Valley Landscape, including area requirements, relative density, population fluctuations, seasonality for wildlife and linkage dynamics.

References

Apps, C. D., N. J. Newhouse, and T. A. Kinley. 2002. Habitat associations of American badgers in southeastern British Columbia. Canadian Journal of Zoology 80:1228-1239.

Becker, H.G., and K.J. Canters.1995. The continuing story of badgers and their tunnels. In the proceedings of the int. conference of habitat fragmentation & infrastructure. Maastricht.

Beier, P. 1993. Determining minimum habitat areas and habitat corridors for cougars. Conservation Biology **7:**94-108.

Beier, P., and R.F. Noss. 1998. Do Habitat Corridors Provide Connectivity? Conservation Biology 12: 1241-1252.

Beier, P., Majka, D.R., and W.D. Spencer. 2007. Forks in the road: choices in GIS procedures for designing wildland linkages. In Review for Conservation Biology.

Beier, P. Personal Communication. 2008.

Bousman, William. 2005. Santa Clara County Bird Checklist. Santa Clara Valley Audubon Society, Cupertino, California.

Bousman, William. 2007. Breeding Bird Atlas of Santa Clara County, California. Santa Clara Valley Audubon Society, Cupertino, California.

Bousman, B. and Smith, K. 2009. Santa Clara County Bird list 2009. http://www.stanford.edu/~kendric/birds/SCLists/SCList09.html.

Buza, L., Young, A., and P. Thrall. 2000. Genetic erosion, inbreeding and reduced fitness in fragmented populations of the endangered tetraploid pea Swainsona recta. Biological Conservation 93:177-186.

Walker, R. and L. Craighead. 1997. Least-Cost-Path Corridor Analysis Analyzing Wildlife Movement Corridors in Montana Using GIS. *in* Proceedings of ESRI User's Conference.

California Native Plant Society Vegetation Committee. 2004. Vegetation Rapid Assessment Protocol.

Clevenger, A.P., Chruszcz, B., and K. E. Gunson. 2001. Highway Mitigation Fencing Reduces Wildlife-Vehicle Collisions. Wildlife Society Bulletin 29: 646-653.

Clevenger, A.P., B. Chruszcz, and K. Gunson 2001. Drainage culverts as habitat linkages and factors affecting passage by mammals. Journal of Applied Ecology 38: 1340–1349.

Clevenger, A.P. and N. Waltho. 2000. Factors Influencing the Effectiveness of Wildlife Underpasses in Banff National Parl, Alberta, Canada. Conservation Biology 14**:** 47-56.

Conservation Biology Institute. 2003. Wildlife Corridor Monitoring Study. Conservation Biology institute, Encinitas, California.

Craighead, A.C., E. A. Roberts, and L.F. Craighead. 2001. Bozeman Pass Wildlife Linkage and Highway Safety Study. *in* Proceedings of the International Conference on Ecology and Transportation.

Crooks, K. R. 2002. Relative sensitivities of mammalian carnivores to habitat fragmentation. Conservation Biology **16:** 488-502.

Crooks, K. and M. Sanjayan. 2006. Connectivity conservation. Cambridge University Press, New York

Department of Fish and Game. In press. Resource Assessment Program 2009 report.

Dickson, B.G., Jenness, J.S. and P. Beier. 2005. Influence of Vegetation, Topography, and Roads on Cougar Movement in Southern California. Journal of Wildlife Management. 69: 264-276.

Dixon, J.D., Oli, M.K., Wooten, M.C., Eason T.H., McCown, J.W., and D. Paetkau. 2006. Effectiveness of a regional corridor in connecting two Florida black bear populations. Conservation Biology 20: 155-162.

Elbroch, M. 2003. Mammal Tracking and Sign. Pp. 3-28. Stackpole Press, Mechanicsburg, Pennsylvania.

Fascione, N., A. Delach and M. Smith. 2004. People and predators: from conflict to coexistence. Island Press, Washington, DC.

Foster M.L., and S. R. Humphrey. 1995. Use of Highway Underpasses by Florida Panthers and Other Wildlife. Wildlife Society Bulletin 23: 95-100.

Federal Highway Administration. 2000c. Critter Crossings: Badger Tunnels. http://www.fhwa.dot.gov/environment/wildlifecrossings/badgertunnels.htm

Forman R.T.T. and L. E. Alexander. 1998. Roads and Their Major Ecological Effects. Annual Review of Ecology and Systematics **29:** 207-231.

Goodrich, J.M. and S.W. Buskirk. 1998. Spacing and Ecology of North American Badgers (Taxidea taxus) in a Prairie-Dog (Cynomys leucurus). Journal of Mammalogy 79: 171-179.

Hickman, J. C. (ed.). 1993. The Jepson Manual of Higher Plants of California. University of California Press, Berkeley.

Hilty, J.A., W. Z., Lidicker Jr., and A.M. Merenlender. 2006. Corridor Ecology. Pp. 195-198. Island Press, Washington, D.C.

Lampe, R. P., and M. A. Sovada. 1981. Seasonal variation in home range of a female badger (*Taxidea taxus*). Prairie Naturalist 13:55-58.

Lampe, R.P.1982. Food Habits of Badgers in East Central Minnesota. The Journal of Wildlife Management 46: 790-795.

Lidicker, W.Z. and W.D. Koenig. 1996. Responses of terrestrial vertebrates to habitat edges and corridors. Pages 85-109 in D.R. McCulloungh, editor. Metapopulations and wildlife conservation.Island Press, Washington, D.C.

Lindzey, F.G. 1982. Movement patterns of badgers in northwestern Utah. Journal of Mammalogy 42:418-422.

Litvaitis, J., J. Sherburne and J. Bissonette. 1986. J. Wildl. Manage. 50: 110-117.

Long, C.A., and C. A. Killingley. 1983. The Badgers of the World. Pp. 84-170. Charles C Thomas Publisher, Springfield, Illinois.

Long, R.A., MacKay, P., Zielinskki, W.J., and J.C. Ray. 2008. Noninvasive Survey Methods for Carnivores. Island Press. Washington, DC, USA.

Maehr, D., R. Noss and J. Larkin. 2001. Large mammal restoration: ecological and sociological challenges in the 21st century. Island Press, Washington, DC.

McCullough, D.R., J. Ballou,, B. Stith, and B. Pranty. 1996. Metapopulations and Wildlife Conservation. Island Press, Washington, D.C.

Messick, J. P., and M. G. Hornocker. 1981. Ecology of the badger in southwestern Idaho. Wildlife Monographs **76:**1-53.

Minta, S. 1993. Sexual differences in spatio-temporal interaction among badgers Oecologia **96:** 402-409.

Maintaining Ecological Connectivity Across the "Missing Middle of the Puente-chino Hills Wildlife Corridor. 2005. Conservation Biology Institute.

Neal, E. 1986.The Natural History of Badgers. Pp.197-200. Facts On File. Inc., New York, NY.

Noss, R. F. 1987. Corridors in real landscapes: A reply to Simmberloff and Cox. Conservation Biology **1:**159-164.

Noss, R.F., Quigley H.B., Hornocker M.G., Merril T.l, and P. C. Paquet. 1996. Conservation Biology and Carnivore Conservation in the Rocky Mountains. Conservation Biology **10**: 949-963.

Penrod, K., C. Cabañero, P. Beier, C. Luke, W. Spencer, and E. Rubin. 2005. South Coast Missing Linkages Project: A Linkage Design for the Sierra Madre-Castaic Connection. South Coast Wildlands, Idyllwild, CA. www.scwildlands.org.

Quinn, J., and T Diamond. In press. Species of Special Concern Report for North American Badgers.

Riley, S.P.D., J.P. Pollinger, R.M. Sauvajot, E.C. York, C. Bromley, T.K. Fuller, and R.K. Wayne. 2006. A southern California freeway is a physical and social barrier to gene flow in carnivores Molecular Ecology 15: 1733-1741.

Rottenborn, S. 1999. Predicting the impacts of urbanization on riparian bird communities. Biological Conservation 88: 289-299.

Sargeant, A. B., and D. W. Warner. 1972. Movements and denning habits of a badger. Journal of Mammalogy 53**:**207-210.

Santa Clara Valley Habitat Plan. Second Administrative Draft 2009. ICF Jones & Stokes.

Santa Clara Vector Control, pers comm 2007

Shuford, W. D., and T. Gardali, [Eds.]. 2008. California bird species of special concern: a ranked assessment of species, subspecies, and distinct populations of birds of immediate conservation concern in California. Studies of Western Birds 1. Western Field Ornithologists, Camarillo, CA.

Spencer, W. 2003. Wildlife Corridor Monitoring Study, Multiple Species Conservation Program. Conservation Biology Institute, San Diego, California.

Spencer, W. 2005. Maintaining ecological connectivity across the "missing middle" of the Puente-Chino Hills wildlife corridor. Conservation Biology Institute, San Diego, California.

Soule, M. E., and J. Terborgh.1999. Continental Conservation. Pp.1-16. Island Press, Washington, D.C.

Thorne, J., D. Cameron., and J.F. Quinn. 2006.A Conservation Design for the Central Coast of California and the Evaluation of Mountain Lion as an Umbrella Species. Natural Areas Journal 26(2):137-148.

Walker, R., and L. Craighead. Leas-Cost path corridor analysis analyzing wildlife movement corridors in Montana using GIS. 1997. *in* Proceedings of ESRI Users's Conference.

Western Governors' Association. 2008. Wildlife Corridor Initiative. 2008 Annual Report.

Williams, D.F. 1986. Mammalian Species of Special Concern in California, American Badger. California Department of Fish and Game, Wildlife Management Division Administration. Report 86-1, Sacramento. 112pp.

Woodroffe, R., and J. R. Ginsberg 1998. Edge effects and the extinction of populations inside protected areas. Science 280:2126-2128.

Woodroffe, R. and J. R. Ginsberg. 2000. Ranging behaviour and vulnerability in carnivores. Pp. 125-140 in L. M. Gosling and W. J. Sutherland (eds.). Behaviour and Conservation. University Press, Cambridge, U.K

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