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Sacramento Fish and Wildlife Office
2800 Cottage Way, Room W-2605
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California Department of
Fish and Game
P.O. Box 47
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In reply refer to:
1-1-07-TA-0347

January 3, 2007

Mr. Joe Horwedel
Director of Planning
Department of Planning, Building and Code Enforcement
City of San Jose
200 East Santa Clara Street
San Jose, California 95113-1905

Subject: Preliminary Comments on the Coyote Valley Specific Plan in the City of San Jose, California

Dear Mr. Horwedel:

The U.S. Fish and Wildlife Service (Service) and California Department of Fish and Game (CDFG) are writing to express our concerns on the Coyote Valley Specific Plan (CVSP). The City of San Jose (City) has been developing the CVSP for some time, and a preliminary plan is being evaluated for review under the California Environmental Quality Act (CEQA). The Santa Clara Valley Habitat Conservation Plan/Natural Community Conservation Plan (HCP/NCCP) is also currently under development. The City is one of the local signatories for the HCP/NCCP, and the CVSP is considered an Interim Project under the Planning Agreement for the HCP/NCCP (County of Santa Clara *et. al.* 2005). This letter has been issued by the Service and CDFG under the authority of the Endangered Species Act of 1973, as amended (16 U.S.C. § 1531 *et seq.*) (FESA), the Service's Mitigation Policy of 1956, the California Endangered Species Act (California Fish and Game Code §§ 2050-2097) (CESA), the Natural Community Conservation Planning Act (NCCPA), and CEQA. Our comments and recommendations are provided to assist you with your environmental review of the project and are not intended to preclude future comments from Service and CDFG.

The Service and CDFG's combined comments and recommendations are based on: 1) the Planning Agreement for the HCP/NCCP (County of Santa Clara *et. al.* 2005); 2) field visits to the action area by the Service and CDFG; 3) various meetings and telephone conference calls attended by the Service, CDFG, and all or some of the signatory agencies to the HCP/NCCP about the CVSP and/or other projects within Santa Clara County; and 4) other information available to us.

Background on the HCP/NCCP and the CVSP

The Planning Agreement for the HCP/NCCP states, "The Parties agree that potential conflicts with the preliminary conservation objectives shall be identified during the Interim Process to help achieve the preliminary conservation objectives, not preclude important conservation planning options or connectivity between areas of high habitat values, and help guide and ensure development of a successful [HCP/NCCP] that incorporates these interim projects" (County of Santa Clara *et. al.* 2005). In addition, the CVSP is specifically identified in the Planning Agreement as an interim project that will adequately compensate for all of its direct and indirect effects and will not preclude the development of a viable conservation strategy for the HCP/NCCP (County of Santa Clara *et. al.* 2005).

The City is in a unique position, due to the interim status of CVSP, to contribute to a landscape-level planning effort for natural communities and special status wildlife species proposed for coverage under the HCP/NCCP. This opportunity is not generally available in project-level planning. The CVSP is a project with potentially significant impacts on natural communities and special status species, including federally and State listed taxa. Although foreseeable landscape level impacts are highly likely, the incorporation of minimization and compensation measures for those impacts are also possible at this stage of planning.

Section 4 of the Planning Agreement (County of Santa Clara *et. al. 2005*) lists the following components as preliminary conservation objectives:

1. Preserve the diversity of plant and animal communities within the Planning Area;
2. Protect Covered Species within the Planning Area;
3. Identify and designate biologically sensitive habitat areas;
4. Conserve habitat, and thereby contribute to the recovery of threatened, endangered and other identified plant and animal species within the Planning Area;
5. Reduce the need to list additional species;
6. Set forth specific habitat-based goals and objectives expressed in terms of amount and quality of habitat;
7. Determine the extent of impacts to species from incidental take caused by Covered Activities; and
8. Provide an effective adaptive management and monitoring strategy for Covered Species and natural communities that is consistent with the NCCPA, FESA, and regulations promulgated thereunder.

The Service and CDFG have been working collaboratively with the City and other local partners on the HCP/NCCP, but have had less input on the development of the CVSP. We are concerned that the preliminary layout of the CVSP has the potential to conflict with the criteria identified above relative to 1) riparian buffers, primarily in the Coyote Creek corridor; 2) habitat

connectivity, particularly relating to animal movements; 3) indirect impacts, particularly relating to nitrogen deposition as it relates to rare plants on serpentine soils; and 4) other potential effects on wildlife and listed species. We understand the current CVSP design is preliminary and that changes are possible, therefore, we are submitting our preliminary comments prior to the circulation of the draft environmental impact report.

Riparian Corridors and Buffers

Riparian corridors and associated buffers provide a wide range of benefits. In addition to providing habitat for terrestrial and aquatic organisms, drainage corridors provide for conveyance and storage of flood waters. Riparian habitats associated with drainages provide additional habitat; filter and control sediment input to streams; stabilize streambanks; control channel erosion and drift; filter and absorb contaminants such as nitrogen, phosphorus, pesticides, petrochemical compounds and metals; provide the woody debris and leaf litter which are integral parts of a healthy riverine and stream system; regulate temperature and light; improve aesthetic conditions; and offer recreational and educational opportunities (Wenger 1999).

In determining an appropriate width for a riparian community, decisions must be made about the relative values of those benefits in relation to one another. Since different vegetative communities and different widths may be appropriate for each benefit, the final width of a corridor can vary widely according to which values are considered most important. In general, wider corridors are superior to narrower corridors, but for some benefits, there may be a maximum limit beyond which additional buffer provides substantially lesser value. For example, Wenger (1999) cites publications indicating that a 300 foot buffer provides maximum benefit to a suite of songbirds, but additional buffer depth beyond 300 feet provides little additional benefit. In addition to these parameters, physical factors such as slope and floodplain width can significantly influence decisions about the appropriate width of a riparian corridor.

In addition to the evaluation of the riparian community, consideration must be given to the potential impacts of any development planned beyond the edge of the corridor (Castelle *et al.* 1994). For example, significant development along the edge of the riparian corridor is more likely to degrade the quality of the riparian community by resulting in increased storm water run-off, light pollution, noise, trash, and deleterious spills.

We are aware that the City has adopted a general standard of 100 feet as the width of a riparian buffer for projects under review within its jurisdiction. We commend the City for adopting a standard and making that standard considerably higher than those in neighboring jurisdictions. However, as with all general standards, the 100 foot standard is based on a number of assumptions regarding the ability of the corridor to provide significant amounts of the previously noted benefits. It is appropriate, given the availability of resources of staffing and expertise, for both the City and responding parties, to accept those assumptions for smaller scale projects affecting limited amounts of streambank. However, large, regional projects like CVSP should not rely on these generalized standards since they affect a significant amount of stream area and

associated habitat. Moreover, generalized standards are not applicable to large interim projects like CVSP because resources are available to conduct site-specific analysis and landscape-level planning.

Our primary concern with the proposed design is relative to Coyote Creek. Coyote Creek is a significant watercourse and provides substantial environmental, aesthetic, and recreational value to the citizens of San Jose and Santa Clara County. The general condition of the stream, relative to most historical drainages between Gilroy and northern Santa Clara County, adds substantial importance to its state and demands particular attention to actions that could potentially impact it. In this situation, adoption of the generalized 100-foot buffer may or may not be appropriate, depending on the desired values of the area by the City, other user groups, and the property owner; potential impacts to the corridor; and obligation to be consistent with the Planning Agreement and HCP/NCCP. Not only must direct and indirect impacts be carefully evaluated, but careful consideration should be paid to the potential for removal of future mitigation and recovery opportunities by maximizing development at the expense of other options. The condition and extent of Coyote Creek makes it a top candidate for riparian enhancement and restoration; the federally and State endangered least Bell's vireo (*Vireo bellii pusillus*) was observed in June 2006 along Coyote Creek near the Coyote Creek Golf Course (T. Rahmig pers. comm. with M. Thomas of the Service, November 16, 2006). The adoption of the CVSP in its current form could preclude future enhancement and restoration options for the Coyote Creek Corridor and the listed bird.

We recommend that the City, in partnership with the Service, CDFG, Regional Water Quality Control Board (RWQCB), and Santa Clara County Parks, meet to reach agreement on what values are commonly desired for the area, identify what data or modeling may be needed to define how to achieve those goals, and produce a draft plan to be incorporated into the CVSP. Please note that to correctly carry out this analysis, the Coyote Creek corridor must be evaluated independently from a predetermined development footprint and then compared to that design.

Habitat Connectivity

Coyote Valley is located at the southern end of a roughly 23-mile long area of highly urbanized development which begins at the southern end of the San Francisco Bay. This existing development has severed all connections between plant and animal communities located to the west and east between the Bay at the north end and where San Jose extends south to Coyote Valley. Buildout of the CVSP, as proposed, would further isolate wildlife communities by extending that impassable barrier an additional 3.5 miles and, depending on the species or community type affected, significantly reduce or eliminate connectivity in the remaining 2 miles between Coyote Valley and Morgan Hill.

Habitat connectivity is a broad term used for describing contact between plant and animal communities in different geographic areas. Most commonly, the focus of discussion around a specific development or area is on wildlife corridors, a loose term for strips or portions of habitat that connect larger habitat areas and allow animals to move from one patch to another with

reduced rates of mortality. Movement of plants and animals from one population to another over time can be critical to the survival of a local population or, for species with limited ranges, the species as a whole (Beier and Noss 1998). Habitat connectivity reduces or eliminates habitat fragmentation, which has been identified as the most significant threat to biological diversity. Urban growth and roads are the leading causes of fragmentation, which have deleterious effects on wildlife sub-populations, migrations, and genetic exchange between populations (Thorne *et. al.* 2002).

In Santa Clara County, the importance of a cross valley wildlife corridor has been noted by Thorne *et al.* (2002) and Penrod *et al.* (2001). These documents discuss the presence of a regionally significant corridor linking the Diablo Range foothills east of the Santa Clara Valley to the Santa Cruz Mountains to the west. The current ecological value of the corridor is unknown and may be limited, depending on the species. There is significant evidence however, that the corridor is in use and that crossing attempts by wildlife occur relatively frequently. Six tule elk (*Cervus canadensis nannodes*) were observed at the base of the Santa Cruz Mountains in 2004, presumably crossing Highway 101 at Scheller Road. A failed crossing attempt by a mountain lion (*Felis concolor*) was recorded at Scheller Road in 2005 and another young mountain lion was killed with a depredation permit in 2006 just south of the crossing attempt (H. Coletto, pers. comm.). These data indicate that animals are aware of the opportunity Scheller Road provides to cross Highway 101 and attempt to use it on a somewhat regular basis. In addition to these records, wild pigs (*Sus scrofa*) have been observed on both sides of the freeway at the Coyote Creek Golf Course underpass (H. Coletto, pers. comm.). From the west, mountain lion scat was recently found on Tulare Hill, as have a number of American badgers (*Taxidea taxus*) (T. Diamond, pers. comm.). All of this data clearly suggests animals are attempting to cross Coyote Valley from east to west and visa versa and that some of these crossing attempts are successful. The importance of this corridor is confirmed in the attached letter from Dr. James Thorne to CDFG (Attachment).

We will use mountain lions as an illustrative example of the local importance of corridors. Mountain lions were selected since they have been subject to many local studies. In addition, mountain lions are commonly used as an umbrella species to evaluate passage conditions. Beier (1993) determined the minimum area necessary to sustain a mountain lion population as 386 - 849 square miles of useable habitat. The current amount of habitat in the Santa Cruz Mountains falls below this level (Thorne *et al.* 2002), placing that population at a significant risk of extinction without immigration from other populations. Two potential paths for this immigration have been identified, one from the south through the Gabilan Range and the other through Coyote Valley (Thorne *et al.* 2002). While the Gabilan route is considered the more important of the two, primarily because of the currently poor condition of the Coyote Creek corridor, it is also currently threatened by the proposed Castro Valley Subdivision (County of Santa Clara 2006). The loss of the Coyote Valley corridor would leave the Gabilan corridor as the sole route into the Santa Cruz Mountains; this would mean cutting off access for most plants and animals north of Morgan Hill. In addition, it would isolate a very significant area of land from historically contiguous areas, except for one pathway. Both corridors are extremely important and we

strongly suggest that local planning decisions seriously consider impacts to both corridors as well as actively taking steps to protect and enhance them.

Identifying the elements needed for a particular corridor to be successful can be a lengthy and specialized task. As a starting point for corridor design, Beier and Loe (1991) suggest that the critical features of a corridor must be results-based rather than based on physical parameters. To this end, they have identified five functions that are necessary for a corridor to be considered successful:

1. Wide ranging animals can travel, migrate and meet mates
2. Plants can propagate
3. Genetic interchange can occur
4. Populations can move in response to environmental changes and natural disasters
5. Individuals can recolonize habitats from which populations have been locally extirpated

These factors should be used as the targets for the design of corridors, and sufficient data should be gathered to demonstrate a fair likelihood of these functions being met. Beier and Loe (1991) go on to note that these criteria have been utilized by the Federal Ninth Circuit Court of Appeals and now constitute legal precedent for this kind of analysis.

To use this framework is necessary to ascertain considerable knowledge about the biology and behavior of each species that might use the corridor so that it can be determined if a corridor will be successful. Since different species have widely varying biology, ecology, and behavior, the project can quickly become overwhelming. The general solution to this problem is to choose a number of representative species that, as a group, are believed to reflect the needs of all species. Beier and Loe (1991) noted that plants and animals projected to move through a corridor fall into two categories, 1) those that move quickly through a corridor in discrete events (passage species) and 2) those that require several events or even multiple generations to pass through a corridor from one patch of habitat to another (corridor dwellers). Examples of corridor dwellers include plants, reptiles, amphibians, and small mammals (i.e., ground squirrels). Corridor dwellers tend to be overlooked in many corridor evaluations, but their needs are no less important. Most of the species covered under the HCP/NCCP that would utilize corridors through Coyote Valley are considered corridor dwellers. In order to help achieve the preliminary conservation objectives of the Planning Agreement, corridor designs for habitat connectivity through Coyote Valley would need to account for corridor dwellers in addition to passage species.

Corridors must be carefully designed to meet the needs of the species that will be using them. Numerous factors, such as the proximity of development, and the composition and density of vegetation can significantly affect how animals use corridors (Beier 1995) as can artificial lighting (Beier 2006) and human presence (Clevenger and Waltho 2000).

The current design of the CVSP makes no accommodations for preserving or enhancing passage or habitat connectivity across Coyote Valley. The issue of the ongoing loss of habitat connectivity and the resulting impacts to plant and animal populations worldwide is well established in the scientific community. There is general agreement that this is also a problem in California (Thorne *et al.* 2006), and Coyote Valley has been specifically identified as a potentially important corridor in at least two studies focused on this issue (Thorne *et al.* 2002; Penrod *et al.* 2001). While the quality of the current crossing is substantially degraded, there is significant evidence that many wildlife species are attempting to cross through the Coyote Valley, with varying degrees of success. Adoption of the CVSP, in its current form, likely will further restrict or end any possibility of passage and preclude future options for restoration.

We recommend that the City meet with the Service and CDFG to discuss, in depth, the issue of habitat connectivity across Coyote Valley. Issues that should be resolved include, but are not limited to, 1) identifying target species, including appropriate federally and State listed species, for corridors; 2) gathering site-specific data regarding corridor qualities that would facilitate the successful use of corridors by the target species; 3) identifying potential crossing locations; 4) determining and implementing measures necessary to restore, enhance, and protect the wildlife crossings in perpetuity; and 5) designing a monitoring program and adaptive management process.

Nitrogen Deposition

Nitrogen deposition from air pollution is one of several indirect effects that likely will result from the CVSP Industrial point sources and nonpoint sources such as automobiles emit nitrogen compounds (both NO_x and ammonia) into the air. Serpentine soils are characterized as having low calcium to magnesium ratio, being nutrient poor (i.e., nitrogen, potassium, and phosphorous limited), and having high concentrations of heavy metals (Kruckenberg 1984). Plants endemic to these soils are adapted to these conditions. Nitrogen compounds from air pollution are deposited on soils and vegetation from the air in both wet (rainfall) and dry conditions. Nitrogen deposition artificially fertilizes serpentine soils and facilitates the spread of invasive plant species. Non-native annual grasses grow rapidly, enabling them to out-compete serpentine endemic species. The displacement of these species, and subsequent decline of the federally threatened bay checkerspot butterfly (*Euphydryas editha bayensis*) and its larval host plants, has been documented on Coyote Ridge, adjacent to the proposed CVSP site (Weiss 1999). The invasion of native grasslands by invasive and/or non-native species is now recognized as one of the major causes of the decline of this listed animal.

In the past, the effects of nitrogen deposition on special status plants and wildlife have been underestimated or were not understood at the time. Nitrogen deposition is known to have deleterious effects on many of the serpentine plants proposed for coverage under the HCP/NCCP, some of which include the federally listed endangered Coyote ceanothus (*Ceanothus ferrisiae*), Santa Clara Valley dudleya (*Dudleya setchellii*), Metcalf Canyon jewelflower (*Streptanthus albidus* ssp. *albidus*), Tiburon paintbrush (*Castilleja affinis* ssp. *neglecta*), as well as the

following special status plants: big-scale balsamroot (*Balsamorhiza macrolepis*), chaparral harebell (*Campanula exigua*), Mount Hamilton thistle (*Cirsium fontinale* var. *campylon),* smooth lessingia (*Lessingia micradenia* var. *glabrata*), and most beautiful jewelflower (*Streptanthus albidus* ssp. *peramoenus*).

Coyote Ridge is located east of the proposed CVSP site. It is considered the most robust source population for the bay checkerspot butterfly and also is inhabited by many special status serpentine plants. Automobiles are the primary source of nitrogen deposition in California (S. Weiss, pers. comm. December 8, 2006). Coyote Ridge is heavily fertilized with nitrogen, presumably primarily due to automobiles traversing Highway 101 (S. Weiss, pers. comm. December 4, 2006). Subsequently, many portions of Coyote Ridge have suffered from invasion by non-native Italian rye grass (*Lolium multiflorum)*, soft chess (*Bromus hordeaceus*), and barbed goat grass (*Aegilops triuncialis* L.) (S. Weiss, pers. comm. December 4, 2006). The recent invasion of barbed goat grass is especially deleterious because cattle grazing, an invasive plant control method implemented on much of Coyote Ridge, does not effectively control barbed goat grass (S. Weiss, pers. comm., December 4, 2006). According to Weiss (2006), nitrogen deposition results in the accelerated accumulation of grass thatch, which smothers small native annual forbs. As such, the disappearance of the bay checkerspot butterfly from a number of sites correlate with non-native grass invasions because its host plants (*Plantago erecta*, *Castilleja exserta*, and *Castilleja densiflora)* are dominated by taller non-native grasses (Weiss 2006). The same non-native grasses out-compete many special status serpentine plants. Similar non-native plant invasions have occurred on Tulare Hill, which is located almost adjacent to the northwest portion of the CVSP site. Tulare Hill contains a population of the bay checkerspot butterfly as well as serving as a corridor or "stepping stone" for dispersal of checkerspots from one side of Coyote Valley to the other (Service 1998). Tulare Hill also provides habitat for multiple special status serpentine plant species.

By promoting the invasion of non-native plants in serpentine soils, where they compete with the sole food plants of the larvae of the bay checkerspot butterfly, and other special status serpentine plants, nitrogen deposition resulting from air pollution, including increased vehicle traffic, at and in the vicinity of CVSP will reduce the quality of surrounding serpentine habitats. Nitrogen tends to be tightly recycled by the plants and microbes in infertile soils like those derived from serpentines, so fertilization impacts could persist there for years and result in cumulative habitat degradation (Weiss 2006). All major remaining populations of the bay checkerspot butterfly and many of the sensitive serpentine plant populations occur in areas subject to air pollution from San Jose, Santa Clara Valley, and the Bay area. Therefore, even excess nitrogen deposition impacts that are less than devastating could significantly diminish the population sizes and possibly the chances of survival of the threatened butterfly and the serpentine-specific plant species.

Other Potential Effects of the CVSP on Wildlife and Listed Species

We are concerned about a number of additional potential adverse effects from the CVSP on listed species and wildlife that include, but are not limited to: 1) death or injury from construction activities; 2) direct damage or destruction of their habitat; 3) increased concentrations of toxic effluents and increased sedimentation due to roadway and urban run-off; 4) altered hydroperiod due to increased run-off that may result in the conversion of ephemeral waterbodies, grasslands, and other habitats to permanent ponds or water bodies of sufficient duration to facilitate the proliferation of non-native predators, such as bullfrogs (*Rana catesbeiana*); 5) death or injury due to strikes from an increased number of vehicles as well as increased vehicle speeds; 6) individuals of the threatened California tiger salamander (*Ambystoma californiense*) and California red-legged frog (*Rana aurora draytonii*) being swept into storm drains while crossing roadways during rain events; 7) harassment and/or capture of the two listed amphibians by future residents, especially children; 8) additional water runoff from the establishment of hard surfaces, such as roads, may lead to the creation of small ephemeral water bodies that may attract breeding California red-legged frogs and California tiger salamanders and encourage their occupation or breeding in these areas, however, the eggs and larvae may perish if the sites dry out before their metamorphosis is completed; 9) loss or reduction due to poisoning or habitat loss of ground squirrels (*Spermophilus beecheyi*) or other rodents whose burrows are used by these two listed amphibians; 10) toxic effects of herbicides and pesticides used at the proposed project, both over the short-term and long-term; 11) introduction or increased susceptibility to disease, such as chytrid fungus which affects amphibians, due to increased human use of the action area; 12) street or other high intensity night lights may affect the behavior, biology, and ecology of nocturnal animals, such as foxes, bats, frogs, and salamanders (Beier 2006; Rydell 2006; Buchanan 1993, 2006; Wise and Buchannan 2006); 13) introduction or enhancement of habitat for non-native predators, such as red fox (*Vulpes vulpes*); and 14) introduction of non-native plants that may reduce degrade or eliminate native habitat.

Conclusion

It is the opinion of both the Service and CDFG that adoption of the CVSP, as currently proposed, may be inconsistent with the preliminary conservation objectives in the Planning Agreement since buffers along the Coyote Creek riparian corridor have not been adequately analyzed, the habitat of special status plants and animals, including listed species will be further fragmented and degraded, and serpentine habitat will be degraded by increased nitrogen deposition. Since the planning process has only minimally incorporated Service and CDFG input to date, the project as proposed likely would separate rather than connect habitats across an identified critical area, reduce the vigor of an unknown number of plant and animal populations, and potentially contribute to the on-going decline of the status of several plant and wildlife species to the point where listing under the FESA and/or CESA may be necessary. The Service and CDFG believe that the proposed CVSP may preclude important conservation planning options and an effective conservation strategy under the HCP/NCCP. The development of an HCP/NCCP requires

substantial attention to protection of landscape-level plant and animal communities and commitment to actions that lead to recovery, not simply ensuring the current condition does not degrade further.

CDFG and the Service encourage open discussions of these technical issues with City staff, their consultants, RWQCB, Santa Clara County Parks, and others as appropriate. Both of our agencies are responsible for public trust resources and, as such, have considerable expertise to offer. A collaborative effort will be more efficient, fit more seamlessly into the HCP/NCCP process, minimize processing delay, and better serve the needs of the City and the environment. Please contact Chris Nagano, Cori Mustin, or Mike Thomas of the Service's Endangered Species Program, at (916) 414-6600 or Dave Johnston, Environmental Scientist, of CDFG at (831) 466-0234 or Mr. Scott Wilson, Acting Environmental Program Manager, of CDFG at (707) 944-5584, if you have any questions regarding this letter.

Sincerely,

Chris Nagano

For Cay C. Goude
Assistant Field Supervisor
Endangered Species Program

Scott Wilson FOR

Charles Armor
Acting Regional Manager
Central Coast Region

Attachment

cc:

Maura Eagan Moody, NOAA-Fisheries, Santa Rosa, California
Jonathan Ambrose, NOAA-Fisheries, Santa Rosa, California
Holly Costa, U.S. Army Corps of Engineers, San Francisco, California
Brian Wines, Regional Water Quality Control Board, Oakland, California
Ken Schrieber, County of Santa Clara, San Jose, California
Jared Hart, City of San Jose, San Jose, California
Darryl Boyd, City of San Jose, San Jose, California
Elish Ryan, Santa Clara County Department of Parks and Recreation, Los Gatos, California
David Zippin, Jones & Stokes, San Jose, California

Literature Cited

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

_____1995. Dispersal of juvenile cougars in fragmented habitat. Journal of Wildlife Management 59(2) 228-237.

_____2006. Effects of artificial night lighting on terrestrial mammals. Pages 19-42 *in* C.Rich and T. Longcore (editors). Ecological consequences of artificial night lighting. Island Press. Washington, D.C.

Beier, P. and S. Loe. 1991. Checklist for evaluating impacts to wildlife corridors. Wildlife Society Bulletin 20:434-440.

Beier, S. and R.F. Noss. 1998. Do habitat corridors really provide connectivity? Conservation Biology 12:1241-1252.

Buchanan, B. W. 1993. Effects of enhanced lighting on the behaviour of nocturnal frogs. Animal Behaviour 45: 89-899.

_____ 2006. Observed and potential effects of artificial light on anuran amphibians. Pages 19-42 *in* C.Rich and T. Longcore (editors). Ecological consequences of artificial night lighting. Island Press. Washington, D.C.

Castelle, A.J., A.W. Johnson and C. Conolly. 1994. Wetland and Stream Buffer Size Requirements-A Review. Journal of Environmental Quality 23:878-882.

Clevenger, A.P. and N. Waltho. 2000. Factors Influencing the Effectiveness of Wildlife Underpasses in Banff National Park, Alberta, Canada. Conservation Biology 14(1) 47-56.

County of Santa Clara, Santa Clara Valley Water District, City of Gilroy, City of Morgan Hill, City of San Jose, Santa Clara Valley Transportation Authority, California Department of Fish and Game, and the United States Fish and Wildlife Service. 2005. Planning Agreement by and among the County of Santa Clara, the Santa Clara Valley Water District, the City of Gilroy, the City of Morgan Hill, the City of San Jose, the Santa Clara Valley Transportation Authority, the California Department of Fish and Game, and the United States Fish and Wildlife Service regarding the Santa Clara Valley Natural Community Conservation Plan. San Jose, California

County of Santa Clara. 2006. Draft environmental impact report, Castro Valley ranch subdivision. Department of Planning and Development, San Jose, California.

Kruckeberg, A.R. 1984. California serpentines: Flora, vegetation, geology, soils, and management problems. University of California Press, Berkeley, California. 180 pp.

Penrod, K., R. Hunter and M. Merrifield. 2001. Missing Linkages: Restoring Connectivity to the California Landscape, Conference Proceedings. Co-sponsored by the Wilderness Coalition, The Nature Conservancy, U.S. Geological Survey, Center for Reproduction of Endangered Species and California Department of Parks and Recreation. Available online at http://www.scwildlands.org/reports/Missing_Linkages.pdf .

Rydell, J. 2006. Bats and their insect prey at streetlights. Pages 43-60 *in* C.Rich and T. Longcore (editors). Ecological consequences of artificial night lighting. Island Press. Washington, D.C.

Thorne, James H., D. Cameron and V. Jigour. 2002. A guide to wildlands conservation in the central region of California. California Wilderness Coalition. Available online at http//www.calwild.org.

Thorne, James H., D. Cameron and J. Quinn. 2006. A conservation design for the central coast of California and the evaluation of the mountain lion as an umbrella species. Nature Areas Journal 26(2) 137-148

U.S. Fish and Wildlife Service. 1998. Recovery Plan for Serpentine Soil Species of the San Francisco Bay Area. U.S. Fish and Wildlife Service. Portland, Oregon. 330+ pp.

Weiss, S.B. 1999. Cars, cows, and checkerspot butterflies: nitrogen deposition and management of nutrient-poor grasslands for a threatened species. Conservation Biology 13:1476-1486.

_____ 2006. Impacts of nitrogen deposition on California ecosystems and biodiversity. PIER Energy-Related Environmental Research, California Energy Commission. CEC-500-2005-165.

Wenger, Seth. 1999. A Review of the Scientific Literature on Riparian Buffer Width, Extent and Vegetation. Office of Public Service and Outreach, Institute of Ecology, University of Georgia. Available online at http://outreach.ecology.uga.edu/tools/buffers/lit_review.pdf .

Wise, S.R. and B.W. Buchanan. 2006. Influence of artificial illumination on the nocturnal behavior and physiology of salamanders. Pages 221-251 *in* C.Rich and T. Longcore (editors). Ecological consequences of artificial night lighting. Island Press. Washington, D.C.

Personal Communications

Henry Coletto, Director, California Deer Association, Gilroy, California. Mr. Coletto was previously a Game Warden with the County of Santa Clara assigned to the CVSP area.

Tanya Diamond, Graduate student at California State University, San Jose, California. Ms. Diamond's thesis work involves least cost path analysis for badgers through the central California region.

Stuart B.Weiss. 2006. Creekside Center for Earth Observations, Menlo Park, California.

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11/15/06

David Johnston
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Yountville, CA. 94599

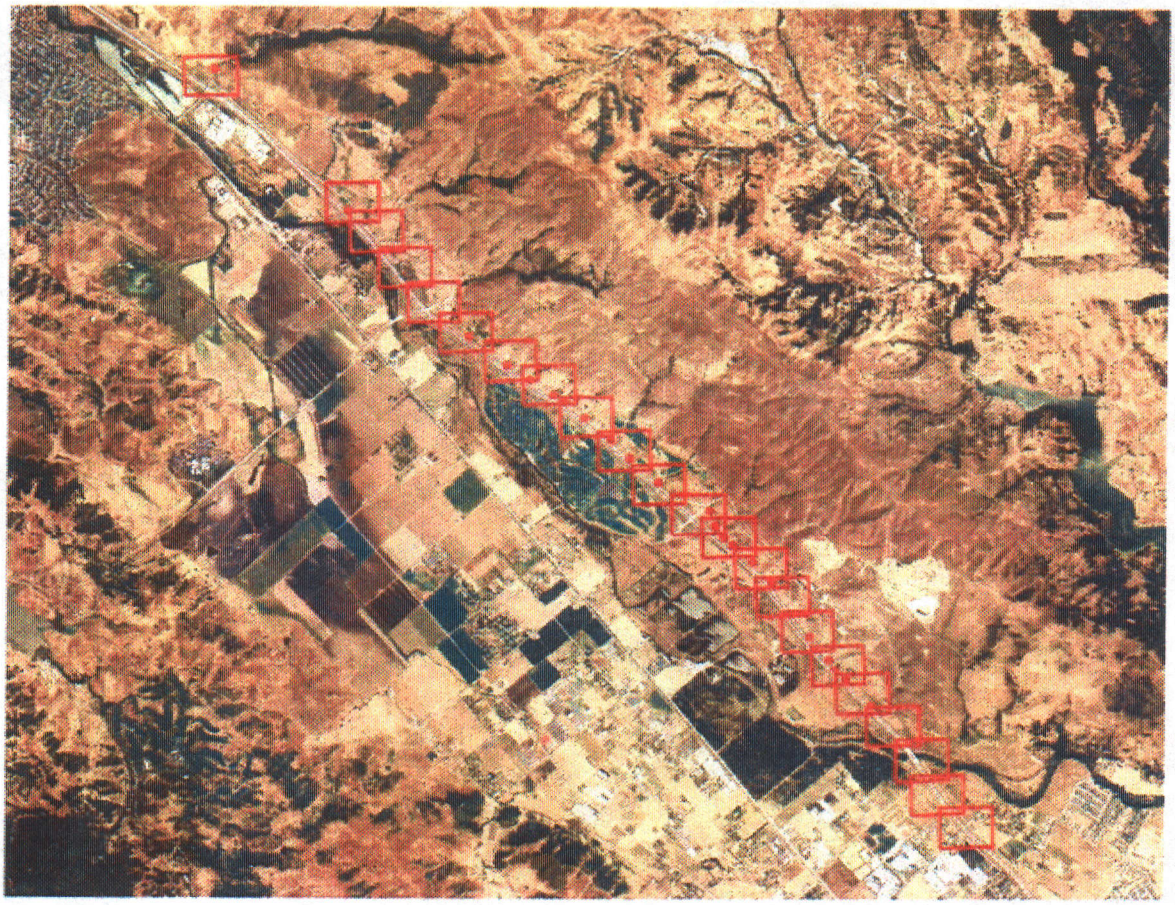
Dear David Johnston,

I am writing in response to your questions about the connectivity of Coyote Valley. As you may know I co-authored a report in 2002 called "A guide to Wildlands Conservation in the Central Coast Region of California". In that report, we examined the remaining suitable core locations for Mountain Lion (*Puma concolor*) in the central coast. I additionally have published an article 'Natural Areas Journal' (Thorne et al. 2006), a scientific, peer-reviewed publication, titled, "A conservation design for the central coast of California and the evaluation of mountain lion as an umbrella species". Both of these publications examined the question of connectivity for mountain lion in the Coyote Valley, among other places.

In the analyses, the mountains to either side of Coyote Valley showed up as containing large enough areas for mountain lion to still be present. The Santa Cruz Mountains in particular were of interest because, while suitable they are rapidly becoming isolated from the rest of state by strips of urban development, which if continued will cut the remaining connectivity. Specifically, there are only two connection options left: east across Coyote Valley to the Diablo Range, or south across the Pajaro River to the Gabilan Range (see section 8 of the report, pages 72-73). The crossing at Coyote Valley is under threat of being cut by expanding urban growth, which is progressing south from San Jose. The crossing at the Pajaro River is under threat from urban expansion coming from two directions: westward from Gilroy and eastward from Watsonville.

It is my understanding that a statement has been made that Highway 101 currently constitutes a complete barrier to animal movement between the Santa Cruz Mountains and the Diablo Range. Following that belief, the development of Coyote Valley will not be assumed to result in any impact to wildlife movement, since the highway already blocks that movement.

It is my opinion that this logic is incorrect. Specifically, there are at least 22 points along State Highway 101 where some type of culvert or overpass exist (Fig 1).



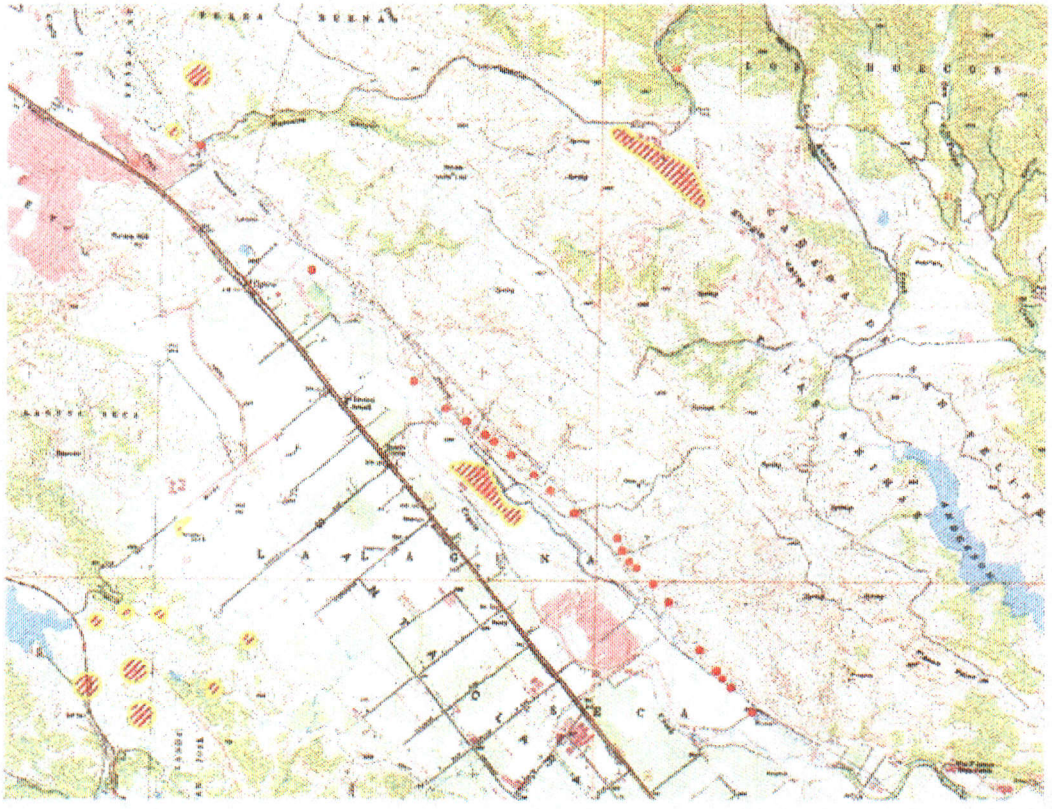
While the majority of these passages are culverts between 24 and 36 inches in size, there are at least three locations in area where the highway runs above the surface of the earth, and where a dispersing mammal might be able to make its way. While there are restricting fences in many places along the freeway, I do not believe that those chain link fences absolve development of mitigation responsibilities. In addition, no such fencing exists at the Coyote Creek opening, nor at the Coyote Creek Golf Course.

The locations of the three overpasses that might most realistically afford passage are areas that I think should be reviewed for suitability of corridor. The groups proposing development should be required to provide mountain lion crossing in at least one, if not two locations in Coyote Valley. The most compelling reason for this is because the Santa Cruz Mountains contain a population of mountain lion, but have too little habitat within them to support a self-sustaining population over long time periods without the occasional dispersal into the mountains of individuals from other parts of California. The Santa Cruz Mountains have become nearly entirely isolated from other suitable habitats due to growing urbanization and development, and there are few locations across the entire mountain range that remain as possible locations for connectivity. Losing the remaining connectivity would result in loss of genetic diversity for the mountain lion population which would effectively be trapped in the Santa Cruz Mountains.

I realize this is not a simple operation for the designers of the proposed developments. It requires that lands from the hills on one side of the valley be made permanently

accessible to lands on the other side of the valley. However, the planning for this type of infrastructure is no more difficult than the planning of urban green belts. In fact, if done correctly, the open areas would increase the value of the housing put in, as the houses would be less constricted, leading to a better quality of life. However, the designs of the corridors should not be thought of as parks, mountain lion will be much less likely to use such infrastructure if dogs are commonly walked there. If it were possible to exclude dogs from corridors widths of 50-200 meters it would likely make these areas more attractive to dispersing mountain lion.

Finally, please note that in addition to mountain lion, there is a herd of Tule Elk (*Cervus elaphus*) is found on the east side of the valley. In addition there are many other smaller animals for which reviews of potential impacts should be made. This list should include all threatened and endangered species in the region that have can be identified by from the CNDDB data, and species of regulatory concern identified by agency biologists, state and federal. For example, the next image shows recent historical records of California tiger salamander in the region. Note that one area shown is quite near to some of the potential crossing locations (Fig.2).



This represents my professional opinion on the matter of connectivity for mountain lion in the Coyote Valley. If you have any questions, please do not hesitate to contact me.

Regards,

James H. Thorne, PhD.