ATTACHMENT #9

FEIR Comments and Responses to FEIR Comments Received After Close of FEIR Review Period

MEMORANDUM

DATE: November 6, 2018

TO: Debby Fernandez, City of Santa Clara

FROM: Kristy Weis

SUBJECT: Gateway Crossings Project Environmental Impact Report – Late Comments Received

Two late comment letters on the Gateway Crossings Project Environmental Impact Report (EIR) were received by the City subsequent to the conclusion of the 45-day Draft EIR public comment period on May 25, 2018. This memo covers comments received following publication of the Final EIR on September 12, 2018 through November 5, 2018.

Late written comments on the EIR were received by the Santa Clara Unified School District and Lozeau Drury LLP. Copies of these comment letters are included in Attachment A. Written comments pertaining to the adequacy of the EIR are summarized by topic below with responses. Comments regarding the merits of the project are not included in the summary below and do not warrant responses under CEQA.

Air Quality Comments

- Impacts to indoor air quality from formaldehyde-based building materials
- Project would have significant operational nitrogen oxide (NOx) and reactive organic compound (ROG) emissions, as modeled by Soil, Water, Air Protection Enterprise (SWAPE)
- Request to evaluate overlapping construction and operational emissions
- Project would have significant cancer risk impacts, as modeled by SWAPE
- Request for the health risk assessment to follow California Office of Environmental Health Hazard Assessment (OEHHA) methodology

Response: As explained in the Draft EIR (page 17), the California Supreme Court in a December 2015 opinion (*California Building Industry Association v. Bay Area Air Quality Management District*) confirmed that CEQA, with several specific exceptions, is concerned with the impacts of a project on the environment, not the effects of the existing environment may have on a project. Therefore, the evaluation of the significance of project impacts under CEQA in the Gateway Crossings EIR focuses on impacts of the project on the environment. While not a CEQA issue, project inhabitants would be protected from potential internal air quality issues, as the project would be required to comply with California Green Building Standards Code (CALGreen) Sections 4.504.5 and 5.504.4.5, which set formaldehyde emissions limits for composite wood products. Composite wood products manufactured in or imported to the U.S. are required to be certified and labeled as California Air

Resources Board (CARB) Airborne Toxic Control Measures (ATCM) Phase II or Toxic Substances Control Act (TSCA) Title VI compliant.

Similar comments and modeling by SWAPE regarding project operational air pollutant emissions were raised in the comment letter submitted by Adams Broadwell Joseph & Cardozo on the Draft EIR. Refer to the Responses E.11, E.10, and E.9 in the Final EIR.

The EIR evaluates the "whole of the action." The project's construction and operational (including project generated trips and operation of the land uses) air pollutant emissions are evaluated in Section 3.3 of the Draft EIR, in accordance with the Bay Area Air Quality Management District *California Environmental Quality Act Air Quality Guidelines* (BAAQMD CEQA Guidelines, May 2017). There is no established methodology or threshold of significance for evaluating construction emissions with operational emissions. See Response E.11 in the Final EIR.

Similar comments and modeling by SWAPE regarding cancer risk impacts were raised in the comment letter submitted by Adams Broadwell Joseph & Cardozo on the Draft EIR. Refer to the Response E.15. The health risk assessment for the project was completed in conformance with the current California Office of Environmental Health Hazard Assessment (OEHHA) methodology. The health risk impacts from the proposed diesel generator on-site was modeled and the results showed the cancer risk would be below the BAAQMD threshold of significance for on- and off-site receptors (Draft EIR page 50).

Biological Resources Comments

- Potential for burrowing owls and bald eagles on-site
- Potential for predators to use project buildings to prey on burrowing owls
- Potential for bird collisions with large glass windows
- Potential for project to interfere with wildlife movement and traffic generated by the project could result in the death of special status species, including Alameda whipsnake, California red-legged frog, California tiger salamander, and American badger, from vehicular collisions

Response: Burrowing owls are found in open, dry grasslands, deserts, and ruderal areas that have vegetation and suitable burrows. The project site was fully developed and the improvements were recently removed in late 2016/early 2017. At the time the Notice of Preparation (NOP) was published in February 2017, which represents the baseline condition for the biological resources impact analysis, all improvements had just been demolished and removed. No vegetation was on-site (except for mature trees) and there was no indication of burrowing owls at the site. For this reason, the project site was not identified in the EIR as suitable burrowing owl habitat.

It is acknowledged that burrowing owls are present in the project vicinity at the Norman Y. Mineta San Jose International Airport, over 1,100 feet east of the site. Coleman Avenue (over 75 feet wide) and existing development (including buildings and airplane hangars) are located between the project site and the known location of burrowing owls at the Airport. Given the distance and existing development located between the project site and the burrowing owls at the Airport, it is unlikely that the project buildings would be used as perches for predators to prey on the burrowing owls at the Airport.

While the project site is not burrowing owl habitat, it is acknowledged that burrowing owls (similar to raptors and other birds addressed in the EIR) are transient species and could navigate to the project site prior to construction. For this reason, measures to protect the burrowing owl, if found present on-site prior to construction, are identified as conditions of project approval and are hereby incorporated into the EIR via the Supplemental Text Revisions Memorandum dated October 30, 2018.

A discussion of bird strikes is included in the Draft EIR (page 60). The project is required to implement safeguards (reduce large areas of transparent or reflective glass, locate water features and other bird habitat away from building exteriors, reduce or eliminate the visibility of landscaped areas behind glass, and avoid use of unnecessary lighting at night) to reduce bird strikes. The dominant routes for migratory birds are those over bodies of water, wetlands, and marshes, which are locations for resting and foraging. These features are not located on or adjacent to the project site. For this reason, it is not anticipated that the project would substantially impact migratory birds or result in substantial bird strikes. No additional measures or mitigation is required.

The project site does not provide important foraging habitat for the bald eagle, Alameda whipsnake, California red-legged frog, California tiger salamander, or American badger. The bald eagle requires large bodies of water or free flowing rivers. The Alameda whipsnake is associated with northern coastal scrub or chaparral habitat and requires rock outcrops for cover and foraging. The California red-legged frog and California tiger salamander require water or aquatic habitat. The American badger occurs in grasslands and open areas of scrubland and forests. None of these habitats are present on or adjacent to the site. For these reasons, the project would not impact movement of these species and traffic generated by the project would not result in death of these species.

Land Use Comments

- Inclusion of affordable housing units
- Consistency with General Plan policy 5.4.3-P20, which highly encourages the development of affordable housing and senior housing in the Santa Clara Station Focus Area
- Lack of affordable housing causing urban decay

Response: As discussed in Response E.6 in the Final EIR (Final EIR page 24), the project is subject to a Development Agreement which requires the project to provide a minimum percentage of units within the project as affordable units.

General Plan policies regarding affordable housing were not adopted to avoid or mitigate an environmental impact; therefore, the project's consistency with General Plan policy 5.4.3-P20 is not discussed in the EIR. Refer to Response E.6 on page 24 of the Final EIR.

The project would not displace existing housing and would provide affordable housing. No substantial evidence was provided showing a correlation between the project and urban decay.

Transportation/Traffic Comments

- Baseline for traffic impacts with or without traffic from the previous BAE facility
- Voluntary contribution toward the VTA US 101 Double Express Lanes project not adequate mitigation
- The project's VMT reduction plan could constitute deferred mitigation

Response: Similar comments regarding the baseline used for the transportation/traffic analysis were provided in the comment letter submitted by Adams Broadwell Joseph & Cardozo on the Draft EIR. Refer to Responses E.19, E.20, and E.21 on pages 38-40 in the Final EIR.

The project's fair-share contribution towards the VTA's Valley Transportation Plan (VTP) 2040 express lane program along US 101 is not a voluntary contribution, rather it is identified as mitigation measure MM TRAN-2.1 on page 190 of the Draft EIR. Mitigation measure MM TRAN-2.1 is enforceable as the contribution is required before issuance of occupancy permits, as identified in the Mitigation Monitoring and Reporting Program for the project.

As stated on page 12 of the Draft EIR (as revised in the Final EIR):

"As part of the project, a Vehicle Miles Traveled (VMT) Reduction Plan shall be developed and implemented. The VMT Reduction Plan shall achieve a 20 percent reduction in project VMT, half of which (a 10 percent reduction) shall be achieved with TDM measures. The VMT reductions may be achieved through project design characteristics, land use, parking, access, and TDM best practices. TDM best practices could include the following:

- Project design to encourage walking, bicycling (e.g., on-site bike lane street design), and convenient transit access;
- Parking cash out/parking pricing;
- Transit fare incentives such as such as free or discounted transit passes on a continuing basis;
- First mile/last mile ride sharing voucher;
- Public-private partnerships or employer contributions to provide improved transit or shuttle service in the project area;
- Commute Trip Reduction Program;
- Ride-sharing programs;
- Bicycle lockers and bicycle racks;
- Showers and clothes lockers for bicycle commuters;
- Preferential parking permit program;
- Parking for car-sharing vehicles; and/or
- Reduced parking ratios/limited parking supply.

The project's VMT Reduction Plan is subject to the City's annual reporting requirements."

The proposed VMT Reduction Plan is also identified as mitigation measure MM AIR-2.1 on page 47 of the Draft EIR. The VMT Reduction Plan is a not deferred mitigation as a performance standard (i.e., 20 percent reduction in project VMT) is identified and the reduction can be accomplished in more than one specified way (see

above bulleted list of possible TDM measures) (CEQA Guidelines Section 15126.4(a)(1)(B)).

Public Service Comments

- Request for the developer to pay a Voluntary Community Benefit Payment in addition to the statutory development fee to provide funds to modernize schools
- Request for help with safer pathways for students to bike to school

Response: Similar comments were raised by the Santa Clara Unified School District on the Draft EIR. Under state law, the school impact fee is considered as an acceptable method of offsetting a project's effect on the adequacy of school facilities. Refer to Response B.2 on page 8 of the Final EIR.

In general, destinations within a 10-minute bike ride, which equates to approximately one mile for elementary and middle school students and approximately two miles for high school students, are considered within biking distance for children. The local schools to the site are not within these typical biking distances and it is not anticipated that students form the proposed project would bicycle to school. Therefore, there is no nexus for the City to require the project assist with pathways for students to bike to school from the project site. Refer to Response B.3 on page 9 of the Final EIR.

Attachment A: Late Comments Received

SANTA CLARA UNIFIED SCHOOL DISTRICT

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Stanley Rose III, Ed.D.
Superintendent

October 11, 2018 VIA EMAIL

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RE: CEQA Final EIR for Gateway Crossings Project; 1205 Coleman Avenue; CEQ2016-01025

Dear Ms. Fernandez:

The Santa Clara Unified School District (District or SCUSD) appreciates the opportunity to respond to the Final Environmental Impact Report (FEIR) for the Gateway Crossings Project (Project), by the City of Santa Clara. The Project is proposing up to 1,600 residential units in a transit oriented development that will attract families who commute to work every day. In our previous letter dated May 24, 2018, the District asked that the EIR take into consideration the impacts that the Gateway Crossings Project will have on the District's school capacity, new construction, existing school modernization, and safe routes to schools.

The District is concerned about the 1,600 residential units proposed in the Project. Students generated from the Project are designated to go to Scott Lane Elementary, Buchser Middle, and Santa Clara High. Even though current student generation rates from the Project do not warrant construction of a new school, they will impact Scott Lane and Santa Clara High. These two schools are already over capacity and cannot absorb the students coming from both the Project and approved future developments.

To alleviate over capacity, the District is planning and constructing a new elementary, middle and high school in north San Jose (Agnews), and planning for a potential 600 student elementary school at Tasman East Specific Plan (TESP). However, even with Bond funds approved by the voters and the Statutory Developer Impact Fees, the District will not have enough funds to build these and additional facilities required for the comprehensive educational experience that the SCUSD strives to provide all of the students.

Funds collected through Statutory Developer Impact Fees can only be used for new construction and cannot be used for the modernization of existing schools. The schools impacted by the Project, Scott Lane, Buchser, and Santa Clara High, need additional funds to be modernized to meet educational standards. In order for the District to be able to meet the current facility requirements for all subjects including art, science, physical education, and music and to accommodate all students within the District, the District respectfully requests a Voluntary Community Benefit Payment from developers.

All state and local jurisdictions affected from the Project will collect 100% or more of the calculated impact of the project, except the District. School districts are at a disadvantage when collecting funds for capital improvements, since districts are restricted to charging a set amount per square foot of a new

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development. The Statutory Developer Impact Fee mandated by SB 50 for residential construction is currently $3.79 per square foot and the industrial and commercial construction is currently $0.61 per square foot. These Statutory fees do not adequately cover the land purchase, design, and construction cost incurred by the SCUSD for new or expanded school facilities.

The SCUSD's Residential Development School Fee Justification Study (RS), dated March 12, 2018, calculates the actual school facilities cost impact per residential square foot for multi-family attached homes to be $28.89 per square foot. This is a deficit of $25.10 for multi-family new residential per square foot constructed. The Commercial/Industrial Development School Fee Justification Study (CID), dated March 12, 2018, calculates the actual net school facilities cost impact of new construction retail to be $2.90 per square foot. This is a deficit of $2.29 per square foot of retail constructed. The CID calculates the actual net impact of office space is $4.59 per square foot, which is a deficit of $3.98 per square foot. Therefore, the Santa Clara Unified School District is requesting developers provide for full mitigation of their impact through a combination of a Voluntary Community Payment and the statutory development fee equal to the calculated impact in the SCUSD RS and CID Studies.

All SCUSD students must have a safe route to get to school, whether it be by driving, walking or biking. The students coming out of the Project may not be within walking distance of the designated schools but the Project is with biking distance of Buchser Middle and Santa Clara High. Both schools are part of the Santa Clara Pedestrian Master Plan which includes creating safer routes to schools, implementing infrastructure to reduce traffic speed, and improving the condition of crosswalks. The District does not have the adequate funds to make recommended infrastructure changes in order to create safer driving, walking, and biking routes to the schools.

The combination of constantly increasing construction costs combined with lack of existing capacity in District schools, make it imperative that the District continually plan for and collect adequate funding for school construction. The District will not support the Project unless full mitigation of the Project's impacts through a combination of Voluntary Community Benefit Payments, the current Statutory Development Impact fees and helping with safer pathways for students to travel to school. The Voluntary Community Benefit Payment will allow the District to continue to house the additional students generated by this and other projects Districtwide and modernize existing classrooms and campuses. The City, District, and Developers must work together to create the best community for all residents.

Sincerely,

Michal Healy

Michal Healy,
Director, Facilities Development and Planning

cc: Stanley Rose; srose@scusd.net
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October 23, 2018

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Re: Gateway Crossings Project, SCH2017022066, PLN2016-12318, PLN2016-12321, PLN2016-12481, and CEQ2016- 01025

Honorable Members of the Planning Commission:

I am writing on behalf of the Laborers International Union of North America, Local Union 270 and its members living in Santa Clara County and/or the City of Santa Clara ("LiUNA"), regarding the Gateway Crossings Project, aka SCH2017022066, PLN2016-12318, PLN2016-12321, PLN2016-12481, and CEQ2016-01025, including all actions related or referring to the proposed construction of a phased mixed-use development, to include up to 1,600 residential units, 182,000 square foot hotel, 15,000 square feet of ancillary retail, and parking at 1205 Coleman Avenue on APNs: 230-46-069 and 230-46-070 in the City of Santa Clara ("Project").

We have reviewed the Draft Environmental Impact Report ("DEIR") and Final Environmental Impact Report ("FEIR") for the Project and conclude that the

documents fail to comply with the California Environmental Quality Act ("CEQA"). We therefore request that the City prepare a Revised Environmental Impact Report ("REIR") to address the deficiencies on the EIR.

PROJECT DESCRIPTION

The project requires a General Plan Amendment (GPA) to change the land use designation on the site to Very High Density Residential to allow residential development at 51 to 100 du/ac in conjunction with a minimum commercial FAR of 0.20; an amendment to the General Plan Land Use Map for the Santa Clara Station Focus Area to reflect the General Plan change; and an amendment to Appendix 8.13 to the General Plan (the Climate Action Plan) to establish a 20 percent reduction in Vehicle Miles Traveled (VMT), half of which (a 10 percent reduction) would be achieved with a Transportation Demand Management (TDM) program. In addition, the project requires a Zoning Code text amendment to add a new zoning designation of Very High Density Mixed Use to facilitate the development of the land uses and building types contemplated for the project site; and a rezoning of the project site to the new zoning designation. The project also includes a Vesting Tentative Parcel Map and Development Agreement.

The project would develop one of two options:

• Option 1: Up to 1,400 dwelling units and up to 215,000 square feet of commercial uses, or

• Option 2: Up to 1,600 dwelling units and up to 215,000 square feet of commercial uses.

Option 2 is the preferred project alternative. The proposed maximum building height on the site under both options is 150 feet and subject to the Federal Aviation Administration (FAA) Regulations Part 77 height restrictions. Under both options, the development would have a minimum setback of 25 feet from Coleman Avenue and Brokaw Road.

LEGAL STANDARD

CEQA requires that an agency analyze the potential environmental impacts of its proposed actions in an environmental impact report ("EIR") (except in certain limited circumstances). *See*, *e.g.*, Pub. Res. Code § 21100. The EIR is the very heart of CEQA. *Dunn-Edwards v. BAAQMD* (1992) 9 Cal.App.4th 644, 652. "The 'foremost principle' in interpreting CEQA is that the Legislature intended the act to be read so as to afford the fullest possible protection to the environment within the reasonable scope of the statutory language." *Comms. for a Better Env't v. Calif. Resources Agency* (2002) 103 Cal. App. 4th 98, 109.

CEQA has two primary purposes. First, CEQA is designed to inform decision makers and the public about the potential, significant environmental effects of a project. 14 Cal. Code Regs. ("CEQA Guidelines") § 15002(a)(1). "Its purpose is to inform the public and its responsible officials of the environmental consequences of their decisions before they are made. Thus, the EIR 'protects not only the environment but also informed self-government.'" *Citizens of Goleta Valley v. Board of Supervisors* (1990) 52 Cal.3d 553, 564. The EIR has been described as "an environmental 'alarm bell' whose purpose it is to alert the public and its responsible officials to environmental changes before they have reached ecological points of no return." *Berkeley Keep Jets Over the Bay v. Bd. of Port Comm'rs*. (2001) 91 Cal. App. 4th 1344, 1354 ("Berkeley Jets"); *County of Inyo v. Yorty* (1973) 32 Cal.App.3d 795, 810.

Second, CEQA requires public agencies to avoid or reduce environmental damage when "feasible" by requiring "environmentally superior" alternatives and all feasible mitigation measures. CEQA Guidelines § 15002(a)(2) and (3); *see also Berkeley Jets*, 91 Cal. App. 4th 1344, 1354; *Citizens of Goleta Valley v. Board of Supervisors* (1990) 52 Cal.3d 553, 564. The EIR serves to provide agencies and the public with information about the environmental impacts of a proposed project and to "identify ways that environmental damage can be avoided or significantly reduced." CEQA Guidelines §15002(a)(2). If the project will have a significant effect on the environment, the agency may approve the project only if it finds that it has "eliminated or substantially lessened all significant effects on the environment where feasible" and that any unavoidable significant effects on the environment are "acceptable due to overriding concerns." Pub.Res.Code ("PRC") § 21081; CEQA Guidelines § 15092(b)(2)(A) & (B).

The EIR is the very heart of CEQA. *Dunn-Edwards v. BAAQMD* (1992) 9 Cal.App.4th 644, 652. CEQA requires that a lead agency analyze all potentially significant environmental impacts of its proposed actions in an EIR. PRC § 21100(b)(1); CEQA Guidelines § 15126(a); *Berkeley Jets*, 91 Cal.App.4th 1344, 1354. The EIR must not only identify the impacts, but must also provide "information about how adverse the impacts will be." *Santiago County Water Dist. v. County of Orange* (1981) 118 Cal.App.3d 818, 831. The lead agency may deem a particular impact to be insignificant only if it produces rigorous analysis and concrete substantial evidence justifying the finding. *Kings County Farm Bureau v. City of Hanford* (1990) 221 Cal.App.3d 692. "The 'foremost principle' in interpreting CEQA is that the Legislature intended the act to be read so as to afford the fullest possible protection to the environment within the reasonable scope of the statutory language." *Communities for a Better Env't v. Calif. Resources Agency* (2002) 103 Cal.App.4th 98, 109.

While the courts review an EIR using an "abuse of discretion" standard, "the reviewing court is not to 'uncritically rely on every study or analysis presented by a project proponent in support of its position. A 'clearly inadequate or unsupported study is entitled to no judicial deference.'" *Berkeley Jets*, 91 Cal. App. 4th 1344, 1355 (emphasis added), quoting, *Laurel Heights Improvement Assn. v. Regents of Univ. of Cal.* (1988) 47 Cal.3d 376, 391 409, fn. 12. A prejudicial abuse of discretion occurs "if the failure to include relevant information precludes informed decisionmaking and informed public participation, thereby thwarting the statutory goals of the EIR process." *San Joaquin Raptor/Wildlife Rescue Center v. County of Stanislaus* (1994) 27 Cal. App. 4th 713, 722]; *Galante Vineyards v. Monterey Peninsula Water Management Dist.* (1997) 60 Cal. App. 4th 1109, 1117; *County of Amador v. El Dorado County Water Agency* (1999) 76 Cal. App. 4th 931, 946.

The lead agency must evaluate comments on the draft EIR and prepare written responses in the final EIR ("FEIR"). (PRC §21091(d)) The FEIR must include a "detailed" written response to all "significant environmental issues" raised by commenters. As the court stated in *City of Long Beach v. LA USD* (2009) 176 Cal.App.4th 889, 904:

> The requirement of a detailed written response to comments helps to ensure that the lead agency will fully consider the environmental consequences of a decision before it is made, that the decision is well informed and open to public scrutiny, and that public participation in the environmental review process is meaningful.

The FEIR's responses to comments must be detailed and must provide a reasoned, good faith analysis. (14 CCR §15088(c)) Failure to provide a substantive response to comment render the EIR legally inadequate. (*Rural Land Owners Assoc. v. City Council* (1983) 143 Cal.App.3d 1013, 1020)

The responses to comments on a draft EIR must state reasons for rejecting suggested mitigation measures and comments on significant environmental issues. "Conclusory statements unsupported by factual information" are not an adequate response. (14 CCR §15088(b, c); *Cleary v. County of Stanislaus* (1981) 118 Cal.App.3rd 348) The need for substantive, detailed response is particularly appropriate when comments have been raised by experts or other agencies. (*Berkeley Keep Jets v. Bd. of Port Comm'rs* (2001) 91 Cal.App.4th 1344, 1367; *People v. Kern* (1976) 72 Cal.app.3d 761) A reasoned analysis of the issue and references to supporting evidence are required for substantive comments raised. (*Calif. Oak Found. v. Santa Clarita* (2005) 133 Cal.App.4th 1219)

The FEIR abjectly fails to meet these legal standards, as it is riddled with conclusory statements lacking any factual support or analysis.

DISCUSSION

1. The EIR Fails to Analyze Indoor Air Quality Impacts.

We submit herewith the comments of indoor air quality expert, Francis Offermann, PE, CIH. (Exhibit A). Mr. Offermann, a Certified Industrial Hygienist, concludes that it is likely that the Project will expose future residents to significant impacts related to indoor air quality, and in particular, emissions for the cancer-causing chemical formaldehyde. Mr. Offermann is one of the world's leading experts on indoor air quality and has published extensively on the topic.

Mr. Offermann explains that many composite wood products typically used in modern home construction contain formaldehyde-based glues which off-gas formaldehyde over a very long time period. He states, "The primary source formaldehyde indoors is composite wood products manufactured with urea-formaldehyde resins, such as plywood, medium density fiberboard, and particle board. These materials are commonly used in residential building construction for flooring, cabinetry, baseboards, window shades, interior doors, and window and door trims."

Formaldehyde is a known human carcinogen. Mr. Offermann states that there is a fair argument that residents of the Amare Project will be exposed to a cancer risk from formaldehyde of approximately 180 per million. This is far above the Bay Area Air Quality Management District (BAAQMD) CEQA significance threshold for airborne cancer risk of 10 per million. Mr. Offermann states:

> Therefore, the cancer risk of a resident living in a median California home with the median indoor formaldehyde concentration of 36 µg/m3, is 180 per million as a result of formaldehyde alone. Assuming the Amare project will be built using typical materials and construction methods used in California, there is a fair argument that future residents will experience a cancer risk from formaldehyde of approximately 180 per million. The CEQA significance threshold for airborne cancer risk is 10 per million, as established by the Bay Area Air Quality Management District (BAAQMD, 2017). There is a fair argument that the Amare project will expose future residents to a significant airborne cancer risk of 180 per million, which is 18 times above the CEQA significance threshold. This impact should be analyzed in an environmental impact report ("EIR"), and the agency should impose all feasible mitigation measures to reduce this impact. Several feasible mitigation measures are discussed below and these and other measures should be analyzed in an EIR.

Even if the Project uses modern "CARB-compliant" materials, Mr. Offermann concludes that formaldehyde will create a cancer risk more than ten times above the

CEQA significance threshold. Mr. Offermann concludes that this significant environmental impact should be analyzed in an EIR and mitigation measures should be imposed to reduce the risk of formaldehyde exposure.

When a Project exceeds a duly adopted CEQA significance threshold, as here, this alone establishes a fair argument that the project will have a significant adverse environmental impact and an EIR is required. Indeed, in many instances, such air quality thresholds are the only criteria reviewed and treated as dispositive in evaluating the significance of a project's air quality impacts. See, e.g. *Schenck v. County of Sonoma* (2011) 198 Cal.App.4th 949, 960 (County applies BAAQMD's "published CEQA quantitative criteria" and "threshold level of cumulative significance"). See also *Communities for a Better Environment v. California Resources Agency* (2002) 103 Cal.App.4th 98, 110-111 ("A 'threshold of significance' for a given environmental effect is simply that level at which the lead agency finds the effects of the project to be significant"). The California Supreme Court made clear the substantial importance that an air district significance threshold plays in providing substantial evidence of a significant adverse impact. *Communities for a Better Environment v. South Coast Air Quality Management Dist.* (2010) 48 Cal.4th 310, 327 ("As the [South Coast Air Quality Management] District's established significance threshold for NOx is 55 pounds per day, these estimates [of NOx emissions of 201 to 456 pounds per day] constitute substantial evidence supporting a fair argument for a significant adverse impact"). Since expert evidence demonstrates that the Project will exceed the BAAQMD's CEQA significance threshold, there is a fair argument that the Project will have significant adverse and an EIR is required.

Mr. Offermann suggests several feasible mitigation measures, such as requiring the use of no-added-formaldehyde composite wood products, which are readily available. Mr. Offermann also suggests requiring air ventilation systems which would reduce formaldehyde levels. Since the EIR does not analyze this impact at all, none of these or other mitigation measures are considered.

2. The EIR Fails to Address or Adequately Mitigate Significant Biological Impacts.

Wildlife biologist Dr. Shawn Smallwood, Ph.D., submits comments herewith. (Exhibit B). Dr. Smallwood concludes that the Project will have significant impacts on many special status species, contrary to the conclusions of the EIR.

According to the EIR (p.59), "Given the urbanized nature of the project site and surrounding area, there are no … special-status animal or plant species on or adjacent to the site." Dr. Smallwood concludes that the EIR is mistaken. He states:

A quick review of eBird reveals 27 special-status species documented very close to the site of the proposed project (Table 1). Many of these species occurrences are on Mineta San Jose International Airport, but others occur in various open spaces near the site. A bald eagle was seen near the Gateway Crossings site only two weeks ago (eBird). Furthermore, the longest-running study of burrowing owls of which I am aware took place at the Airport (Barclay 2007, Barclay et al. 2011, Menzel 2014, 2018). Beginning in 1989 and continuing through 2011, this study invested heavily in efforts to encourage burrowing owl breeding success, which is critical because burring owls have declined to the point of near extirpation in the region. The study collected 14,088 burrowing owl records, which must be the most massive data base on burrowing owls collected anywhere. Forty breeding pairs of burrowing owls occupied the Airport in 2002, although the number has declined since then. Burrowing owl nest sites were located only 400 m from the site of the proposed Gateway Crossings Project. Additionally, Menzel (2014) listed bird species detected at the Airport during her burrowing owl research there, 7 of which are special-status species also reported in the area on eBird (Table 2).

The fact that the EIR failed to identify protected species such as the bald eagle and burrowing owl demonstrates that the EIR fails to include an adequate environmental setting analysis.

Dr. Smallwood concludes that the Project will have adverse impacts on various special status species. For example, placing tall buildings near burrowing owls will increase opportunities for predators to prey on burrowing owls since predator species perch on tall buildings and swoop down upon burrowing owls and other species.

Dr. Smallwood also concludes that the widespread use of large glass windows in the Project will result in collision deaths since birds will fly into those windows. Dr. Smallwood concludes that mitigation measures in the EIR are inadequate to mitigate bird collision impacts. Dr. Smallwood suggests numerous feasible measures to reduce bird collisions, but these measures are not analyzed in the EIR.

Dr. Smallwood concludes that the Project will interfere with wildlife movement, contrary to the conclusions of the EIR. He also concludes that the traffic generated by the Project will result in the death of special status species from vehicular collisions. Species likely to be affected by vehicular collisions include, Alameda whipsnake (Masticophis lateralis euryxanthus), California red-legged frog (Rana draytonii), California tiger salamander (Ambystoma californiense), and American badger (Taxidea taxus).

3. The EIR Fails to Adequately Mitigate the Project's Significant Traffic Impacts.

a. The EIR Uses an Improper Baseline.

The EIR uses an improper baseline. The EIR subtracts air quality emissions and traffic from the BAE project from the emissions and traffic of the proposed Project. This artificially makes it appear that Project emissions and traffic will be lower than they actually will be. This "baseline" approach is improper because the BAE project has been closed for more than two years and was closed at time of the Notice of Preparation. The DEIR (p. 25) states:

> The former buildings were occupied by BAE systems until as recent as April 2016. The project site is currently vacant and undeveloped and has minimal physical features. The project site is secured by five to 10-foot chain link fencing around the perimeter of the property. As shown in Photos 1 and 2, most of the fencing is screened, obscuring views of the project site from the surrounding public right-of-way. The project site consists of bare ground with some areas covered with ruderal vegetation. There are several tall mounds of aggregate and/or dirt on-site and electricity poles and overhead wires. An existing Groundwater Extraction and Treatment System (GWETS) is located on the western boundary of the site, which can be seen from Brokaw Road. Existing mature trees are located at the southeastern corner of the project site (refer to Section 3.4 Biological Resources for more information about the trees on-site).

The Notice of Preparation (NOP) was posted on February 21, 2017 – one year after the closure of BAE in April 2016.

Every CEQA document must start from a "baseline" assumption. The CEQA "baseline" is the set of environmental conditions against which to compare a project's anticipated impacts. *Communities for a Better Environment v. So Coast Air Qual. Mgmnt. Dist*. (2010) 48 Cal. 4th 310, 321. Section 15125(a) of the CEQA Guidelines (14 C.C.R., § 15125(a)) states in pertinent part that a lead agency's environmental review under CEQA:

> An EIR must include a description of the physical environmental conditions in the vicinity of the project, as they exist ***at the time the notice of preparation is published,*** or if no notice of preparation is published, at the time environmental analysis is commenced, from both a local and regional perspective. This environmental setting will normally constitute the baseline

> physical conditions by which a lead agency determines whether an impact is significant. The description of the environmental setting shall be no longer than is necessary to an understanding of the significant effects of the proposed project and its alternatives.

(See, *Save Our Peninsula Committee v. County of Monterey* (2001) 87 Cal.App.4th 99, 124-125 ("*Save Our Peninsula*.") As the court of appeal has explained, "the impacts of the project must be measured against the 'real conditions on the ground,'" and not against hypothetical permitted levels. (*Save Our Peninsula*,87 Cal.App.4th 99, 121-123.) As the court has explained, using such a skewed baseline "mislead(s) the public" and "draws a red herring across the path of public input." (*San Joaquin Raptor Rescue Center v. County of Merced* (2007) 149 Cal.App.4th 645, 656; *Woodward Park Homeowners v. City of Fresno* (2007) 150 Cal.App.4th 683, 708-711.)

Since the BAE facility was closed at the time the NOP was published, it was legally erroneous for the EIR to subtract the BAE emissions and traffic from the proposed Project's traffic. This created a false impression for the public that the Project's impacts will be less significant than they will actually be when compared to the true baseline of a vacant site.

Traffic Engineer Daniel T. Smith, PE, demonstrates that the baseline traffic counts for the EIR were conducted when the BAE project was still operational in 2014 and 2015. Thus, the EIR uses an improper baseline for traffic analysis. Mr. Smith concludes that this results in a very significant underestimation of Project traffic:

> This results in an 18.37 percent reduction in the net new daily trips, a 37.8 percent reduction in the AM peak trips and a 27.29 percent reduction in the PM trips actually generated by the Project. As a result, the Project's transportation impacts are greatly underestimated

The Final EIR (p. 39) admits that the traffic baseline was conducted while the BAE facility was still operational, but the FEIR does not correct this error. This constitutes an inadequate response to comments, as well as a failure to utilize a proper baseline.

b. The EIR Fails to Adequately Mitigate the Project's Significant Traffic Impacts.

The DEIR identified 21 freeway segment impacts and states that the Project Developer will provide a voluntary contribution toward the VTA US 101 Double Express Lanes project. Voluntary contributions are not adequate mitigation. Mitigation measures must be fully enforceable through permit conditions, agreements or other legally binding instruments. 14 CCR § 15126.4(a)(2). See *Woodward Park Homeowners Assn., Inc. v. City of Fresno* (2007) 150 Cal. App. 4th 683, 730 (project proponent's agreement to a mitigation by itself is insufficient; mitigation measure must be an enforceable requirement). A voluntary contribution is by definition not enforceable.

The EIR relies on a VMT reduction plan that has not yet been developed. CEQA prohibits this type of deferred mitigation. The DEIR states:

> a Vehicle Miles Traveled (VMT) Reduction Plan shall be developed and implemented. As described in Section 2.2.1.4 of the Draft EIR, the VMT Reduction Plan shall achieve a 20 percent reduction in project VMT, half of which (a 10 percent reduction) shall be achieved with Transportation Demand Management (TDM) measures.

"A study conducted after approval of a project will inevitably have a diminished influence on decisionmaking. Even if the study is subject to administrative approval, it is analogous to the sort of post hoc rationalization of agency actions that has been repeatedly condemned in decisions construing CEQA." (*Sundstrom v. County of Mendocino* (1988) 202 Cal.App.3d 296, 307.) "[R]eliance on tentative plans for future mitigation after completion of the CEQA process significantly undermines CEQA's goals of full disclosure and informed decisionmaking; and[,] consequently, these mitigation plans have been overturned on judicial review as constituting improper deferral of environmental assessment." (*Communities for a Better Environment v. City of Richmond* (2010) 184 Cal.App.4th 70, 92.)

4. The Project Lacks Affordable Housing in Conflict with the General Plan.

The Project does not include any affordable housing units, in complete disregard of the applicable General Plan policies. This is of particular concern to LIUNA members who are increasingly priced out of the area.

The General Plan policies for the Santa Clara Station Focus Area, in which the Project is located, specifically calls for the development of affordable housing within the Focus Area.

> 5.4.3-P20 Highly encourage the development of affordable housing and senior housing that is well designed and compatible with adjacent uses in the Santa Clara Station Focus Area.

According to the California Department of Housing and Community Development, the City has made "insufficient progress" toward its Lower Income Regional Housing Needs Allocation (RHNA), which includes housing for very low and low income.

The Final EIR rejects comments made concerning affordable housing, arguing that the issue is socio-economic and not environmental, and therefore not within the scope of CEQA. This is mistaken. It is well-established that urban decay is a CEQA issue. The lack of affordable housing has led to an increase in homelessness, which is a prime contributor to urban decay. In *Bakersfield Citizens for Local Control v. City of Bakersfield* (2004) (124 Cal.App.4th 1184) (*Bakersfield Citizens*), the court expressly held that an EIR must analyze a project's potential to cause urban decay if there is substantial evidence showing that the project may lead to such impacts. The court pointed out that CEQA requires the project proponent to discuss the project's economic and social impacts where "[a]n EIR may trace a chain of cause and effect from a proposed decision on a project through anticipated economic or social changes resulting from the project to physical changes caused in turn by the economic and social changes." (CEQA Guidelines §§ 15131(a) and 15064(f).)

Where a local or regional policy of general applicability, such as an ordinance, is adopted in order to avoid or mitigate environmental effects, a conflict with that policy in itself indicates a potentially significant impact on the environment. (*Pocket*

Protectors v. Sacramento (2005) 124 Cal.App.4th 903.) Indeed, any inconsistencies between a proposed project and applicable plans must be discussed in an EIR. (14 CCR § 15125(d); *City of Long Beach v. Los Angeles Unif. School Dist*. (2009) 176 Cal. App. 4th 889, 918; *Friends of the Eel River v. Sonoma County Water Agency* (2003) 108 Cal. App. 4th 859, 874 (EIR inadequate when Lead Agency failed to identify relationship of project to relevant local plans).) A Project's inconsistencies with local plans and policies constitute significant impacts under CEQA. (*Endangered Habitats League, Inc. v. County of Orange* (2005) 131 Cal.App.4th 777, 783-4, 32 Cal.Rptr.3d 177; see also, *County of El Dorado v. Dept. of Transp*. (2005) 133 Cal.App.4th 1376 (fact that a project may be consistent with a plan, such as an air plan, does not necessarily mean that it does not have significant impacts).)

A supplemental EIR should be prepared to analyze the impacts of the Project's lack of affordable housing and the impact on urban decay. It should propose feasible mitigation measures, such as requiring more affordable housing in the Project, contributions to low-income housing funding, etc.

5. The EIR Fails to Adequately Analyze or Mitigate the Project' Significant Air Quality Impacts.

The expert consulting firm, Soil, Water, Air Protection Enterprise (SWAPE), demonstrates that the EIR improperly calculates air quality impacts. SWAPE concludes that the Project will have significant nitrogen oxide (NOx) and reactive organic compound (ROG) emissions, contrary to the conclusion of the EIR. SWAPE states:

> When correct, site-specific input parameters are used to model emissions, we find that the Project's operational ROG and NOx emissions increase significantly when compared to the DEIR's CalEEMod model emission estimates for full Project build out. Furthermore, we find that ROG and NOx emissions exceed the 54 pounds per day (lbs/day) thresholds set for by the BAAQMD (see table below)…
>
> As you can see in the table above, when emissions are modeled correctly, both ROG and NOx emissions would exceed BAAQMD thresholds. Specifically, our analysis demonstrates that operational activity would emit approximately 61 lbs/day of ROG emissions and approximately 57 lbs/day of NOx emissions, which is higher than what the DEIR previously estimated.

The Final EIR inadequately responds to these comments. First, the FEIR states that there is no requirement to consider overlapping construction and operational emissions. This is incorrect. The courts have held that an agency may not piecemeal a project and consider emissions from different sources separately. For example, in Kings County Farm Burea v. Hanford, the court held that it was legal error to consider mobile source emissions separately from stationary source emissions. See *Kings County Farm Bureau v. Hanford* (1990) 221 Cal.App.3d 692, 716-17 (agency must consider "the whole of an action" including indirect truck impacts, together with direct power plant impacts).

SWAPE calculates that the Project will have highly significant airborne cancer risk impacts, far above CEQA significance thresholds. SWAPE calculates that the Project will create an airborne cancer risk of 107 per million – far above the BAAQMD CEQA significance threshold of 10 per million. The FEIR dismisses this comment, stating that the Project will comply with BAAQMD requirements, and that "Sources of air pollutant emissions complying with all applicable BAAQMD regulations generally are not be considered to have a significant air quality community risk impact." (FEIR p. 31).

This analysis is incorrect. The courts have held that compliance with Air District rules is not sufficient to render an impact less than significant for CEQA purposes. In *Kings County Farm Bureau v. Hanford* (1990) 221 Cal.App.3d 692, 716, the court held that that EPA and local Air District issued permits for plant does not establish no significant effect under CEQA.

The Final EIR also conducts a different health risk assessment that allegedly shows a cancer risk less than 10 per million. However, the HRA used in the FEIR fails to comply with the recent California Office of Environmental Health Hazard Assessment (OEHHA) methodology. The lead agency is required to use the agency-approved methodology, not some other obsolete methodology. *Endangered Habitats League v. Orange* (2005) 131 Cal.App.4th 777.

CONCLUSION

For the foregoing reasons, and for the reasons set forth by other commenters (which are incorporated herein by reference), the EIR for the Gateway Crossing Project is legally inadequate. A revised EIR is required to analyze and mitigate the proposed Project's significant impacts.

Sincerely,

Richard Drury

EXHIBIT A

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From: Francis J. Offermann PE CIH

Subject: Indoor Air Quality: Gateway Crossing Project

Pages: 9

Indoor Air Quality Impacts

Indoor air quality (IAQ) directly impacts the comfort and health of building occupants, and the achievement of acceptable IAQ in newly constructed and renovated buildings is a well-recognized design objective. For example, IAQ is addressed by major high-performance building rating systems and building codes (California Building Standards Commission, 2014; USGBC, 2014). Indoor air quality in homes is particularly important because occupants, on average, spend approximately ninety percent of their time indoors with the majority of this time spent at home (EPA, 2011). Some segments of the population that are most susceptible to the effects of poor IAQ, such as the very young and the elderly, occupy their homes almost continuously. Additionally, an increasing number of adults are working from home at least some of the time during the workweek.

The concentrations of many air pollutants often are elevated in homes relative to outdoor air because many of the materials and products used indoors contain and release a variety of pollutants to air (Hodgson et al., 2002; Offermann and Hodgson, 2011). With respect to indoor air contaminants for which inhalation is the primary route of exposure, the critical design and construction parameters are the provision of adequate ventilation and the

reduction of indoor sources of the contaminants.

Indoor Formaldehyde Concentrations Impact. In the California New Home Study (CNHS) of 108 new homes in California (Offermann, 2009), 25 air contaminants were measured, and formaldehyde was identified as the indoor air contaminant with the highest cancer risk as determined by the California Proposition 65 Safe Harbor Levels (OEHHA, 2017), No Significant Risk Levels (NSRL) for carcinogens. The NSRL is the daily intake level calculated to result in one excess case of cancer in an exposed population of 100,000 (i.e., ten in one million cancer risk) and for formaldehyde is 40 µg/day. The NSRL concentration of formaldehyde that represents a daily dose of 40 µg is 2 $\mu g/m^3$, assuming a continuous 24-hour exposure, a total daily inhaled air volume of 20 m^3, and 100% absorption by the respiratory system. All of the CNHS homes exceeded this NSRL concentration of 2 $\mu g/m^3$. The median indoor formaldehyde concentration was 36 $\mu g/m^3$, and ranged from 4.8 to 136 $\mu g/m^3$, which corresponds to a median exceedance of the 2 $\mu g/m^3$ NSRL concentration of 18 and a range of 2.3 to 68.

Therefore, the cancer risk of a resident living in a median California home with the median indoor formaldehyde concentration of 36 $\mu g/m^3$, is 180 per million as a result of formaldehyde alone. Assuming this project will be built using typical materials and construction methods used in California, there is a fair argument that future residents will experience a cancer risk from formaldehyde of approximately 180 per million. The CEQA significance threshold for airborne cancer risk is 10 per million, as established by the Bay Area Air Quality Management District (BAAQMD, 2017). There is a fair argument that this project will expose future residents to a significant airborne cancer risk of 180 per million, which is 18 times above the CEQA significance threshold. This impact should be analyzed in an environmental impact report ("EIR"), and the agency should impose all feasible mitigation measures to reduce this impact. Several feasible mitigation measures are discussed below and these and other measures should be analyzed in an EIR.

Besides being a human carcinogen, formaldehyde is also a potent eye and respiratory irritant. In the CNHS, many homes exceeded the non-cancer reference exposure levels (RELs) prescribed by California Office of Environmental Health Hazard Assessment

(OEHHA, 2017). The percentage of homes exceeding the RELs ranged from 98% for the Chronic REL of 9 $\mu g/m^3$ to 28% for the Acute REL of 55 $\mu g/m^3$.

The primary source of formaldehyde indoors is composite wood products manufactured with urea-formaldehyde resins, such as plywood, medium density fiberboard, and particle board. These materials are commonly used in residential building construction for flooring, cabinetry, baseboards, window shades, interior doors, and window and door trims.

In January 2009, the California Air Resources Board (CARB) adopted an airborne toxics control measure (ATCM) to reduce formaldehyde emissions from composite wood products, including hardwood plywood, particleboard, medium density fiberboard, and also furniture and other finished products made with these wood products (California Air Resources Board 2009). While this formaldehyde ATCM has resulted in reduced emissions from composite wood products sold in California, they do not preclude that homes built with composite wood products meeting the CARB ATCM will have indoor formaldehyde concentrations that are below cancer and non-cancer exposure guidelines.

A follow up study to the California New Home Study (CNHS) was conducted in 2016-2018 (Chan et. al., 2018), and found that the median indoor formaldehyde in new homes built after the 2009 CARB formaldehyde ATCM had lower indoor formaldehyde concentrations, with a median indoor concentrations of 25 $\mu g/m^3$ as compared to a median of 36 $\mu g/m^3$ found in the 2007 CNHS.

Thus, while new homes built after the 2009 CARB formaldehyde ATCM have a 30% lower median indoor formaldehyde concentration and cancer risk, the median lifetime cancer risk is still 125 per million for homes built with CARB compliant composite wood products which is more than 12 times the NSRL 10 in a million cancer risk.

<u>Outdoor Air Ventilation Impact</u>. Another important finding of the CNHS, was that the outdoor air ventilation rates in the homes were very low. Outdoor air ventilation is a very important factor influencing the indoor concentrations of air contaminants, as it is the

primary removal mechanism of all indoor air generated air contaminants. Lower outdoor air exchange rates cause indoor generated air contaminants to accumulate to higher indoor air concentrations. Many homeowners rarely open their windows or doors for ventilation as a result of their concerns for security/safety, noise, dust, and odor concerns (Price, 2007). In the CNHS field study, 32% of the homes did not use their windows during the 24-hour Test Day, and 15% of the homes did not use their windows during the entire preceding week. Most of the homes with no window usage were homes in the winter field session. Thus, a substantial percentage of homeowners never open their windows, especially in the winter season. The median 24-hour measurement was 0.26 ach, with a range of 0.09 ach to 5.3 ach. A total of 67% of the homes had outdoor air exchange rates below the minimum California Building Code (2001) requirement of 0.35 ach. Thus, the relatively tight envelope construction, combined with the fact that many people never open their windows for ventilation, results in homes with low outdoor air exchange rates and higher indoor air contaminant concentrations.

The mixed-use development proposed for Gateway Crossings in Santa Clara, CA is located close to roads with moderate to high traffic and rail traffic. As a result this development has been determined to be a sound impacted site according to the Gateway Crossings Project Noise and Vibration Assessment (Illingsworth & Rodkin, 2018), and exterior noise levels of 68 to 72 dBA CNEL may occur. This report state that the project shall retain a qualified acoustical specialist to prepare a detailed analysis of interior residential noise levels resulting from all exterior sources during the final design phase of the project pursuant to requirements set forth in the State Building Code.

As a result of the high outdoor traffic related noise levels, the current project anticipates the need for mechanical supply of outdoor air ventilation air to allow for a habitable interior environment with closed windows and doors within each residential unit. Such a ventilation system would allow windows and doors to be kept closed at the occupant's discretion to control exterior noise within residential interiors.

Mechanical outdoor air ventilation systems may be designed in three airflow configurations; exhaust only systems, balanced outdoor air supply and exhaust systems, and outdoor air

supply only systems. Exhaust only systems are the least expensive system, and in multi-family residential buildings, such as those at this project, typically consist of continuously operated bathroom exhaust fans and an acoustically treated opening in the exterior wall, sometimes referred to as a Z-Duct. The Z-Duct exterior opening typically has soundliner installed on the inside surfaces of the opening to reduce the transmission of exterior noise to the indoors. The continuously operating bathroom fans create a negative air pressure in the unit that causes outdoor air to enter the indoor space through the Z-Duct. However, this negative air pressure allows for air to infiltrate the units from adjacent units, the hallways, and the exterior walls. This infiltrating air can cause staining on carpeting and on walls around electrical outlets, as well as transporting air between adjacent units, which causes complaints from cooking and smoking odors. Since tobacco smoke is a known carcinogen, the transport of the tobacco smoke to adjacent units, poses a health risk to those exposed in the adjacent units. In addition, the negative pressure created in units by exhaust only systems can cause sewer gas to enter the indoor air should plumbing drain traps become dry.

Also, the Z-Duct openings for exhaust only systems preclude the inclusion of efficient outdoor air filtration without adversely impacting the flow of outdoor air into the unit. Both balanced outdoor air supply and exhaust systems, and outdoor air supply only systems, can have efficient outdoor air filtration without adversely impacting the flow of outdoor air into the unit.

<u>$PM_{2.5}$ Outdoor Concentrations Impact</u>. An additional impact of the nearby motor vehicle and railroad traffic and stationary sources associated with this project, are the increased outdoor concentrations of $PM_{2.5}$. The modeled maximum annual $PM_{2.5}$ concentration, with construction mitigation measured implemented for this project and two nearby projects, was determined to be 0.60 $\mu g/m^3$ (Illingsworth & Rodkin, 2017, Table 5). The maximum increased cancer risk for residential receptors was calculated to be 36.2 per million. As a result, the airborne cancer risk for the future residents of the project, including the cancer risk of 125 per million cited earlier for indoor formaldehyde exposures, may be 156 per million.

Table 5. Cumulative Construction Risk Assessment at MEI

Source	Maximum Cancer Risk (per million)	Maximum Annual $PM_{2.5}$ Concentration ($\mu g/m^3$)	Maximum Hazard Index
Project Construction			
Unmitigated	122.6	1.4	0.12
Implementation of Mit. Measure 1 and Recmd. Measure 3	6.1	<0.3	<0.01
Mission Town Center Construction (Mitigated)	<2.7	<0.1	<0.01
BART Silicon Valley Phase II Construction (Mitigated)	<1.6	<0.1	<0.02
El Camino Real[1]	--	--	--
Coleman Avenue at 900 feet	2.1	0.1	<0.03
Railroad Traffic	<14.6	0.0	<0.01
Plant 19357, Atlantic – San Jose[1] 1250 Aviation Avenue	--	--	--
Plant 15839, Santa Clara Police Facility 601 El Camino Real	<9.1	0.0	<0.01
Plant G9614, Costco Wholesale #129 1601 Coleman Avenue[1]	--	--	--
Plant 10821, Hewlett-Packard Aviation 1210 Aviation Avenue[1]	--	--	--
Project Generator	<0.4	<0.01	<0.01
Cumulative Total			
Unmitigated	<153.1	1.7	<0.2
Mitigated	<36.2	<0.6	<0.09
BAAQMD Threshold – Cumulative Sources	***>100***	***>0.8***	***>10.0***
Exceeds Threshold After Mitigation?	***No***	***No***	***No***

Notes: [1]This source is located over 1,000 feet from the construction MEI.

Indoor Air Quality Impact Mitigation Measures

The following are recommended mitigation measures to minimize the impacts upon indoor quality:

- indoor formaldehyde concentrations
- outdoor air ventilation
- $PM_{2.5}$ outdoor air concentrations

Indoor Formaldehyde Concentrations Mitigation. Use only composite wood materials (e.g. hardwood plywood, medium density fiberboard, particleboard) for all interior finish systems that are made with CARB approved no-added formaldehyde (NAF) resins or ultra-low emitting formaldehyde (ULEF) resins (CARB, 2009).

Outdoor Air Ventilation Mitigation. Provide each habitable room (i.e. bedrooms, living rooms, dining rooms, etc.) with a mechanical supply of outdoor air that meets or exceeds

the California 2016 Building Energy Efficiency Standards (California Energy Commission, 2015) requirements of the greater of 15 cfm/occupant or 0.15 cfm/ft^2 of floor area. Following installation of the system conduct testing and balancing to insure that required amount of outdoor air is entering each habitable room and provide a written report documenting the outdoor airflow rates. Do not use exhaust only mechanical outdoor air systems, use only balanced outdoor air supply and exhaust systems or outdoor air supply only systems. Provide a manual for the occupants that describes the purpose of the mechanical outdoor air system and the operation and maintenance requirements of the system.

$PM_{2.5}$ Outdoor Air Concentration Mitigation. Install air filtration with a minimum efficiency of MERV 13 to filter the outdoor air entering the mechanical outdoor air supply system. Install the air filters in the system such that that they are accessible for replacement by the occupants. Include in the mechanical outdoor air ventilation system manual instructions on how to replace the air filters and the estimated frequency of replacement.

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Education

- M.S. Mechanical Engineering Stanford University, Stanford, CA.
- Graduate Studies in Air Pollution Monitoring and Control University of California, Berkeley, CA.
- B.S. in Mechanical Engineering Rensselaer Polytechnic Institute, Troy, N.Y.

Professional Affiliations

ACGIH, AIHA, ASHRAE, CSI, ASTM, ISIAQ, PARMA, and USGBC

Work Experience

Mr. Offermann PE, CIH, has 36 years experience as an IAQ researcher, technical author, and workshop instructor. He is president of Indoor Environmental Engineering, a San Francisco based IAQ R&D consulting firm. As president of Indoor Environmental Engineering, Mr. Offermann directs an interdisciplinary team of environmental scientists, chemists, and mechanical engineers in indoor air quality building investigations. Under Mr. Offermann's supervision, IEE has developed both pro-active and reactive IAQ measurement methods and diagnostic protocols. He has supervised over 2,000 IAQ investigations in commercial, residential, and institutional buildings and conducted numerous forensic investigations related to IAQ.

Litigation Experience

Mr. Offermann has been qualified numerous times in court as an expert in the field of indoor air quality and ventilation for both plaintiffs and defendants. He has been deposed over 150 times in cases involving indoor air quality/ventilation issues in commercial, residential, and institutional buildings involving construction defects, and/or operation and maintenance problems. Examples of indoor air quality cases he has worked on are alleged personal injury and/or property damages from mold and bacterial contamination/moisture intrusion, building renovation activities, insufficient outdoor air ventilation, off gassing of volatile organic compounds from building materials and coatings, malfunctioning gas heaters and carbon monoxide poisoning, and applications of pesticides. Mr. Offermann has testified with respect to the scientific admissability of expert testimony regarding indoor air quality issues via Daubert and Kelly-Frye motions.

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CLICKY ANALYTICS CLICKY ANALYTICS

EXHIBIT B

Shawn Smallwood, PhD
3108 Finch Street
Davis, CA 95616

Debby Fernandez
City of Santa Clara
1500 Warburton Avenue
Santa Clara, CA 95050

22 October 2018

RE: Gateway Crossings FEIR

Dear Ms. Fernandez,

I write to comment on the Final Environmental Impact Report (FEIR and associated documents (City of Santa Clara 2018) prepared for the proposed Gateway Crossings Project, which I understand would add 1,600 dwelling units and a hotel in buildings up to 13 stories high (150 feet) covering 24 acres located at the southwest corner of Coleman Avenue and Brokaw Road in the City of Santa Clara.

My qualifications for preparing expert comments are the following. I hold a Ph.D. degree in Ecology from University of California at Davis, where I also worked for four years as a post-graduate researcher in the Department of Agronomy and Range Sciences. My research is on animal density and distribution, habitat selection, habitat restoration, interactions between wildlife and human infrastructure and activities, conservation of rare and endangered species, and on the ecology of invading species. I have authored papers on special-status species issues, including "Using the best scientific data for endangered species conservation" (Smallwood et al. 1999) and "Suggested standards for science applied to conservation issues" (Smallwood et al. 2001). I served as Chair of the Conservation Affairs Committee for The Wildlife Society – Western Section. I am a member of The Wildlife Society and the Raptor Research Foundation, and I've been a part-time lecturer at California State University, Sacramento. I served as Associate Editor of Biological Conservation and of wildlife biology's premier scientific journal, The Journal of Wildlife Management, and I served on the Editorial Board of Environmental Management.

I have performed wildlife surveys in California for thirty-three years. I studied the impacts of human activities and human infrastructure on wildlife, including on golden eagle, Swainson's hawk, burrowing owl, San Joaquin kangaroo rat, mountain lion, California tiger salamander, California red-legged frog, and other species. I have performed research on wildlife mortality caused by wind turbines, electric distribution lines, agricultural practices, and road traffic, and I've performed wildlife surveys at many proposed project sites. I collaborate with colleagues worldwide on the underlying science and policy issues related to anthropogenic impacts on wildlife.

My CV is attached.

BIOLOGICAL IMPACTS ASSESSMENT

According to City of Santa Clara (2018:59), "*Given the urbanized nature of the project site and surrounding area, there are no … special-status animal or plant species on or adjacent to the site*." City of Santa Clara is incorrect about this. A quick review of eBird reveals 27 special-status species documented very close to the site of the proposed project (Table 1). Many of these species occurrences are on Mineta San Jose International Airport, but others occur in various open spaces near the site. A bald eagle was seen near the Gateway Crossings site only two weeks ago (eBird). Furthermore, the longest-running study of burrowing owls of which I am aware took place at the Airport (Barclay 2007, Barclay et al. 2011, Menzel 2014, 2018). Beginning in 1989 and continuing through 2011, this study invested heavily in efforts to encourage burrowing owl breeding success, which is critical because burring owls have declined to the point of near extirpation in the region. The study collected 14,088 burrowing owl records, which must be the most massive data base on burrowing owls collected anywhere. Forty breeding pairs of burrowing owls occupied the Airport in 2002, although the number has declined since then. Burrowing owl nest sites were located only 400 m from the site of the proposed Gateway Crossings Project. Additionally, Menzel (2014) listed bird species detected at the Airport during her burrowing owl research there, 7 of which are special-status species also reported in the area on eBird (Table 2).

The project could directly affect burrowing owls at the Airport by negatively altering their perception of the suitability of the Airport for nesting. Burrowing owls cannot tolerate tall structures near their breeding sites because tall structures bring raptors that hunt and kill burrowing owls. Predators such as peregrine falcons use buildings as perch-hides from which they launch effective strikes on burrowing owls. Those burrowing owls that do not leave a breeding site overshadowed by tall buildings are liable to be pounced upon and eaten by peregrine falcons. Also, the buildings will illuminate burrowing owls at night, exposing them to predation from larger owls and interfering with their foraging.

I found no evidence of any detection surveys having been performed for wildlife at the site of the proposed project. The conclusion that no special-status bird species occur at the site appears to have been based on speculation. No evidence supports the City of Santa Clara's conclusion, whereas ample evidence in eBird and research reports refutes it. City of Santa Clara needs to perform an appropriate assessment of potential impacts on special-status species of birds, one that is either founded on protocol-level surveys or on appropriate use of the precautionary principle in risk assessment (National Research Council 1986, O'Brien 2000). Using the precautionary principle, one would, in the face of uncertainty, assume presence of each special-status species potentially nesting in the trees or on the grounds of the site or of species stopping over during migration or using the site for staging.

Table 1. Species reported on eBird (https://eBird.org) or other sources on or near the proposed project site.

Species	Scientific name	Status[1]	Location
California tiger salamander	*Ambystoma californiense*	FT, CT	Along travel routes to site
California red-legged frog	*Rana draytonii*	FT, SSC	Along travel routes to site
Alameda whipsnake	*Masticophis lateralis euryxanthus*	FT, CT	Along travel routes to site
Western pond turtle	*Emys marmorata*	SSC	Along travel routes to site
Pallid bat	*Antrozous pallidus*	SSC	Within geographic range
Western red bat	*Lasiurus blossevillii*	SSC	Within geographic range
Salt marsh wandering shrew	*Sorex vagrans halicoetes*	SSC	Along travel routes to site
American badger	*Taxidea taxus*	SSC	Along travel routes to site
Salt marsh harvest mouse	*Reithrodontomys raviventris*	FE, CE, CFP	Along travel routes to site
California gull	*Larus californicus*	TWL	Nearby eBird postings
Bald eagle	*Haliaeetus leucocephalus*	BGEPA, BCC, CE	Nearby eBird postings
Golden eagle	*Aquila chrysaetos*	BGEPA, BCC, CFP	Nearby eBird postings
Red-tailed hawk	*Buteo jamaicensis*	CDFW 3503.5	Nearby eBird postings
Ferruginous hawk	*Buteo regalis*	CDFW 3503.5, TWL	Nearby eBird postings
Red-shouldered hawk	*Buteo lineatus*	CDFW 3503.5	Nearby eBird postings
Sharp-shinned hawk	*Accipiter striatus*	CDFW 3503.5, TWL	Nearby eBird postings
Cooper's hawk	*Accipiter cooperi*	CDFW 3503.5, TWL	Nearby eBird postings
Northern harrier	*Circus cyaneus*	SSC3	Nearby eBird postings
White-tailed kite	*Elanus leucurus*	CFP, TWL	Nearby eBird postings
American kestrel	*Falco sparverius*	CDFW 3503.5	Nearby eBird postings
Merlin	*Falco columbarius*	CDFW 3503.5, TWL	Nearby eBird postings
Prairie falcon	*Falco mexicanus*	CDFW 3503.5, TWL	Nearby eBird postings
Peregrine falcon	*Falco peregrinus*	CE, CFP	Nearby eBird postings
Burrowing owl	*Athene cunicularia*	BCC, SSC2	Nearby eBird postings
Short-eared owl	*Asio flammeus*	SSC3	Nearby eBird postings
Barn owl	*Tyto alba*	CDFW 3503.5	Nearby eBird postings
Western screech-owl	*Megascops kennicottii*	CDFW 3503.5	Nearby eBird postings
Vaux's swift	*Chaetura vauxi*	SSC2	Nearby eBird postings
Allen's hummingbird	*Selasphorus sasin*	BCC	Nearby eBird postings
Olive-sided flycatcher	*Contopus cooperi*	SSC2	Nearby eBird postings
Oak titmouse	*Baeolophus inornatus*	BCC	Nearby eBird postings

Loggerhead shrike	*Lanius ludovicianus*	BCC, SSC2	Nearby eBird postings
Yellow-billed magpie	*Pica nuttalli*	BCC	Nearby eBird postings
Yellow warbler	*Setophaga petechia*	SSC2	Nearby eBird postings
Common yellowthroat	*Geothlypis trichas sinuosa*	SSC3	Nearby eBird postings
Tricolored blackbird	*Agelaius tricolor*	SSC1	Nearby eBird postings

[1] Listed as FCC = U.S. Fish and Wildlife Service Bird of Conservation Concern, BCC = federal Bird Species of Conservation Concern, CE = California endangered, CT = California threatened, CFP = California Fully Protected (CDFG Code 4700), CDFW 3503.5 = California Department of Fish and Wildlife Code 3503.5 (Birds of prey), and SSC1, SSC2 and SSC3 = California Bird Species of Special Concern priorities 1, 2 and 3, respectively (Shuford and Gardali 2008), and TWL = Taxa to Watch List (Shuford and Gardali 2008).

Table 2. Bird species seen by Sandra Menzel (2014) at Mineta San Jose International Airport, 2009-10.

Species	Scientific name	Status[1]
American crow	*Corvus brachyrhynchos*	
American kestrel	*Falco sparverius*	CDFW 3503.5
American pipit	*Anthus rubesens*	
Anna's hummingbird	*Calypte anna*	
Barn swallow	*Hirundo rustica*	
Black phoebe	*Sayornis nigricans*	
Brewer's blackbird	*Euphagus cyanocephalus*	
Burrowing owl	*Athene cunicularia*	BCC, SSC2
California gull	*Larus californicus*	TWL
Canada goose	*Branta canadensis*	
Common raven	*Corvus corax*	
European starling	*Sturnus vulgaris*	
Golden eagle	*Aquila chrysaetos*	BGEPA, BCC, CFP
Great blue heron	*Ardea herodias*	
House finch	*Carpodacus mexicanus*	
Killdeer	*Charadrius vociferus*	
Loggerhead shrike	*Lanius ludovicianus*	BCC, SSC2
Mallard	*Anas platyrhynchos*	
Mourning dove	*Zenaida macroura*	
Northern mockingbird	*Mimus polyglottos*	
Red-tailed hawk	*Buteo jamaicensis*	CDFW 3503.5
Rock pigeon	*Columba livia*	
Say's phoebe	*Sayornis saya*	
Tree swallow	*Tachycineta bicolor*	
Turkey vulture	*Cathartes aura*	CDFW 3503.5
Violet-green swallow	*Tachycineta thalassina*	
Western meadowlark	*Sturnella neglecta*	
Yellow-rumped warbler	*Dendroica coronata*	

WINDOW COLLISIONS

City of Santa Clara deserves credit for addressing collisions of birds with windows on tall buildings, because few impact assessments of similar projects do so. Window collisions is one of the key sources of wildlife impact posed by the proposed project. Unfortunately, the City of Santa Clara (2018a) defers formulation of mitigation plans specific to window collisions to some unspecified later date, and insufficiently addresses the impact. City of Santa Clara (12018a:60) writes, "*The project shall prepare and submit a plan to implement bird-safe design standards into project buildings and lighting design to minimize hazards to birds*." A few design standards are bulleted, including:

– Reduce large areas of transparent or reflective glass;

– Locate water features and other bird habitat away from building exteriors to reduce reflection;

– Reduce or eliminate the visibility of landscaped areas behind glass;

– To the extent consistent with the normal and expected operations of the residential and commercial uses of the project, take appropriate measures to avoid use of unnecessary lighting at night, especially during bird migration season (February through May and August through November) through the installation of motion-sensor lighting, automatic light shut-off mechanisms, downward-facing exterior light fixtures, or other effective measures to the extent possible.

All these measures would likely reduce collision fatalities, but I am left skeptical that they could be implemented to degrees that would be effective. For example, conceptual rendering in City of Santa Clara (2018:32) indicate considerable window transparency, even though City of Santa Clara (2018:33) explains that enhanced glazing will be used. Which version is consistent with the intended outcome? And without thresholds in the bulleted standards above, I am left wondering about the effectiveness of those measures. What does it mean to reduce large areas of transparent glass when the conceptual rendering depicts large areas of transparent glass? For each measure, what level of reduction is acceptable? And how will these measures be enforced?

Window collisions are often characterized as either the second or third largest source or anthropogenic-caused bird mortality. The numbers behind these characterizations are often attributed to Klem's (1990) and Dunn's (1993) estimates of about 100 million to 1 billion bird fatalities in the USA, or more recently Loss et al.'s (2014) estimate of 365-988 million bird fatalities in the USA or Calvert et al.'s (2013) and Machtans et al.'s (2013) estimates of 22.4 million and 25 million bird fatalities in Canada, respectively. However, these estimates and their interpretation warrant examination because they were based on opportunistic sampling, volunteer study participation, and fatality monitoring by more inexperienced than experienced searchers.

Klem's (1990) estimate was based on speculation that 1 to 10 birds are killed per building per year, and this speculated range was extended to the number of buildings estimated by the US Census Bureau in 1986. Klem's speculation was supported by fatality monitoring at only two houses, one in Illinois and the other in New York. Also, the basis of his fatality rate extension has changed greatly since 1986. Whereas his estimate served the need to alert the public of the possible magnitude of the bird-window collision issue, it was highly uncertain at the time and undoubtedly outdated more than three decades hence. Indeed, by 2010 Klem (2010) characterized the upper end of his estimated range – 1 billion bird fatalities – as conservative. Furthermore, the estimate lumped species together as if all birds are the same and the loss of all birds to windows has the same level of impact.

Homes with birdfeeders are associated with higher rates of window collisions than are homes without birdfeeders (Kummer and Bayne 2015, Kummer et al. 2016a), so the developed area might pose even greater hazard to birds if it includes numerous birdfeeders. Another factor potentially biasing national or North American estimates low was revealed by Bracey et al.'s (2016) finding that trained fatality searchers found 2.6× the number of fatalities found by homeowners on the days when both trained searchers and homeowners searched around homes. The difference in carcass detection was 30.4-fold when involving carcasses volitionally placed by Bracey et al. (2016) in blind detection trials. This much larger difference in trial carcass detection rates likely resulted because their placements did not include the sounds that typically alert homeowners to actual window collisions, but this explanation also raises the question of how often homeowner participants with such studies miss detecting window-caused fatalities because they did not hear the collisions.

By the time Loss et al. (2014) performed their effort to estimate annual USA bird-window fatalities, many more fatality monitoring studies had been reported or were underway. Loss et al. (2014) were able to incorporate many more fatality rates based on scientific monitoring, and they were more careful about which fatality rates to include. However, they included estimates based on fatality monitoring by homeowners, which in one study were found to detect only 38% of the available window fatalities (Bracey et al. 2016). Loss et al. (2014) excluded all fatality records lacking a dead bird in hand, such as injured birds or feather or blood spots on windows. Loss et al.'s (2014) fatality metric was the number of fatalities per building (where in this context a building can include a house, low-rise, or high-rise structure), but they assumed that this metric was based on window collisions. Because most of the bird-window collision studies were limited to migration seasons, Loss et al. (2014) developed an admittedly assumption-laden correction factor for making annual estimates. Also, only two of the studies included adjustments for carcass persistence and searcher detection error, and it was unclear how and to what degree fatality rates were adjusted for these factors. Although Loss et al. (2014) attempted to account for some biases as well as for large sources of uncertainty mostly resulting from an opportunistic rather than systematic sampling data source, their estimated annual fatality rate across the USA was highly uncertain and vulnerable to multiple biases, most of which would have resulted in fatality estimates biased low.

In my review of bird-window collision monitoring, I found that the search radius around homes and buildings was very narrow, usually 2 meters. Based on my experience with bird collisions in other contexts, I would expect that a large portion of bird-window collision victims would end up farther than 2 m from the windows, especially when the windows are higher up on tall buildings. In my experience, searcher detection rates tend to be low for small birds deposited on ground with vegetation cover or woodchips or other types of organic matter. Also, vertebrate scavengers entrain on anthropogenic sources of mortality and quickly remove many of the carcasses, thereby preventing the fatality searcher from detecting these fatalities. Adjusting fatality rates for these factors – search radius bias, searcher detection error, and carcass persistence rates – would greatly increase nationwide estimates of bird-window collision fatalities.

High-rise buildings intercept many nocturnal migrants as well as birds flying in daylight. Johnson and Hudson (1976) found 266 bird fatalities of 41 species within 73 months of monitoring of a four-story glass walkway at Washington State University (no adjustments attempted). Somerlot (2003) found 21 bird fatalities among 13 buildings on a university campus within only 61 days. Monitoring twice per week, Hager at al. (2008) found 215 bird fatalities of 48 species, or 55 birds/building/year, and at another site they found 142 bird fatalities of 37 species for 24 birds/building/year. Gelb and Delacretaz (2009) recorded 5,400 bird fatalities under buildings in New York City, based on a decade of monitoring only during migration periods, and some of the high-rises were associated with hundreds of fatalities each. Klem et al. (2009) monitored 73 building facades in New York City during 114 days of two migratory periods, tallying 549 collision victims, nearly 5 birds per day. Borden et al. (2010) surveyed a 1.8 km route 3 times per week during 12-month period and found 271 bird fatalities of 50 species. Parkins et al. (2015) found 35 bird fatalities of 16 species within only 45 days of monitoring under 4 building facades. From 24 days of survey over 48 day span, Porter and Huang (2015) found 47 fatalities under 8 buildings on a university campus. Sabo et al. (2016) found 27 bird fatalities 61 days of searches under 31 windows. In San Francisco, Kahle et al. (2016) found 355 collision victims within 1,762 days under a 5-story building. Ocampo-Peñuela et al. (2016) searched the perimeters of 6 buildings on a university campus, finding 86 fatalities after 63 days of surveys. One of these buildings produced 61 of the 86 fatalities, and another building with collision-deterrent glass caused only 2 of the fatalities. There is ample evidence available to support my prediction that the proposed 150-foot tall building, along with the other buildings, will result in many collision fatalities of birds.

COLLISION FACTORS

Below is a list of collision factors I found in the scientific literature, and some of which overlap City of Santa Clara's bulleted list. Following this list are specific notes and findings taken from the literature and my own experience.

(1) Inherent hazard of a structure in the airspace used for nocturnal migration or other flights

(2) Window transparency, falsely revealing passage through structure or to indoor plants
(3) Window reflectance, falsely depicting vegetation, competitors, or open airspace
(4) Black hole or passage effect
(5) Window or façade extent, or proportion of façade consisting of window or other reflective surface
(6) Size of window
(7) Type of glass
(8) Lighting, which is correlated with window extent and building operations
(9) Height of structure (collision mechanisms shift with height above ground)
(10) Orientation of façade with respect to winds and solar exposure
(11) Structural layout causing confusion and entrapment
(12) Context in terms of urban-rural gradient, or surrounding extent of impervious surface vs vegetation
(13) Height, structure, and extent of vegetation grown near home or building
(14) Presence of birdfeeders or other attractants
(15) Relative abundance
(16) Season of the year
(17) Ecology, demography and behavior
(18) Predatory attacks or cues provoking fear of attack
(19) Aggressive social interactions

(1) Inherent hazard of structure in airspace.—Not all of a structure's collision risk can be attributed to windows. Overing (1938) reported 576 birds collided with the Washington Monument in 90 minutes on one night, 12 September 1937. The average annual fatality count had been 328 birds from 1932 through 1936. Gelb and Delacretaz (2009) and Klem et al. (2009) also reported finding collision victims at buildings lacking windows, although many fewer than they found at buildings fitted with widows.

(2) Window transparency.—Widely believed as one of the two principal factors contributing to avian collisions with buildings is the transparency of glass used in windows on the buildings (Klem 1989). Gelb and Delacretaz (2009) felt that many of the collisions they detected occurred where transparent windows revealed interior vegetation.

(3) Window reflectance.—Widely believed as one of the two principal factors contributing to avian collisions with buildings is the reflectance of glass used in windows on the buildings (Klem 1989). Reflectance can deceptively depict open airspace, vegetation as habitat destination, or competitive rivals as self-images (Klem 1989). Gelb and Delacretaz (2009) felt that many of the collisions they detected occurred toward the lower parts of buildings where large glass exteriors reflected outdoor vegetation. Klem et al. (2009) and Borden et al. (2010) also found that reflected outdoor vegetation associated positively with collisions.

(4) Black hole or passage effect.—Although this factor was not often mentioned in the bird-window collision literature, it was suggested in Sheppard and Phillips (2015). The

black hole or passage effect is the deceptive appearance of a cavity or darkened ledge that certain species of bird typically approach with speed when seeking roosting sites. The deception is achieved when shadows from awnings or the interior light conditions give the appearance of cavities or protected ledges. This factor appears potentially to be nuanced variations on transparency or reflectance or possibly an interaction effect of both of these factors.

(5) Window or façade extent.—Klem et al. (2009), Borden et al. (2010), Hager et al. (2013), and Ocampo-Peñuela et al. (2016) reported increased collision fatalities at buildings with larger reflective facades or higher proportions of facades composed of windows. However, Porter and Huang (2015) found a negative relationship between fatalities found and proportion of façade that was glazed.

(6) Size of window.—According to Kahle et al. (2016), collision rates were higher on large-pane windows compared to small-pane windows.

(7) Type of glass.—Klem et al. (2009) found that collision fatalities associated with the type of glass used on buildings. Otherwise, little attention has been directed towards the types of glass in buildings.

(8) Lighting.—Parkins et al. (2015) found that light emission from buildings correlated positively with percent glass on the façade, suggesting that lighting is linked to the extent of windows. Zink and Eckles (2010) reported fatality reductions, including an 80% reduction at a Chicago high-rise, upon the initiation of the Lights-out Program. However, Zink and Eckles (2010) provided no information on their search effort, such as the number of searches or search interval or search area around each building.

(9) Height of structure.—I found little if any hypothesis-testing related to high-rise buildings, including whether another suite of factors might relate to collision victims of high-rises. Are migrants more commonly the victims of high-rises? I would expect that some of the factors noted in other contexts will not be important with the upper portions of high-rises, such as birds attacking reflected self-images, or the extent of vegetation cover nearby, or the presence or absence of birdfeeders nearby.

(10) Orientation of façade.—Some studies tested façade orientation, but not convincingly. Confounding factors such as the extent and types of windows would require large sample sizes of collision victims to parse out the variation so that some portion of it could be attributed to orientation of façade.

(11) Structural layout.—Bird-safe building guidelines have illustrated examples of structural layouts associated with high rates of bird-window collisions, but little attention has been towards hazardous structural layouts in the scientific literature. An exception was Johnson and Hudson (1976), who found high collision rates at 3 stories of glassed-in walkways atop an open breezeway, located on a break in slope with trees on one side and open sky on the other, Washington State University.

(12) Context in urban-rural gradient.—Numbers of fatalities found in monitoring have associated negatively with increasing developed area surrounding the building (Hager et al. 2013), and positively with more rural settings (Kummer et al. 2016a). However, these relationships might not hold when it comes to high-rises.

(13) Height, structure and extent of vegetation near building.—Correlations have sometimes been found between collision rates and the presence or extent of vegetation near windows (Hager et al. 2008, Borden et al. 2010, Kummer et al. 2016a, Ocampo-Peñuela et al. 2016). However, Porter and Huang (2015) found a negative relationship between fatalities found and vegetation cover near the building.

(14) Presence of birdfeeders.—Dunn (1993) reported a weak correlation ($r = 0.13$, $P < 0.001$) between number of birds killed by home windows and the number of birds counted at feeders. However, Kummer and Bayne (2015) found that experimental installment of birdfeeders at homes increased bird collisions with windows 1.84-fold.

(15) Relative abundance.—Collision rates have often been assumed to increase with local density or relative abundance (Klem 1989), and positive correlations have been measured (Dunn 1993, Hager et al. 2008). However, Hager and Craig (2014) found a negative correlation between fatality rates and relative abundance near buildings.

(16) Season of the year.—Borden et al. (2010) found 90% of collision fatalities during spring and fall migration periods. The significance of this finding is magnified by 7-day carcass persistence rates of 0.45 and 0.35 in spring and fall, rates which were considerably lower than during winter and summer (Hager et al. 2012). In other words, the concentration of fatalities during migration seasons would increase after applying seasonally-explicit adjustments for carcass persistence.

(17) Ecology, demography and behavior.—Klem (1989) noted that certain types of birds were not found as common window-caused fatalities, including soaring hawks and waterbirds. Cusa et al. (2015) found that species colliding with buildings surrounded by higher levels of urban greenery were foliage gleaners, and species colliding with buildings surrounded by higher levels of urbanization were ground foragers. Sabo et al. (2016) found no difference in age class, but did find that migrants are more susceptible to collision than resident birds.

(18) Predatory attacks.—Panic flights caused by raptors were mentioned in 16% of window strike reports in Dunn's (1993) study. I have witnessed Cooper's hawks chasing birds into windows, including house finches next door to my home and a northern mocking bird chased directly into my office window.

(19) Aggressive social interactions.—I found no hypothesis-testing of the roles of aggressive social interactions in the literature other than the occasional anecdotal account of birds attacking their self-images reflected from windows. However, I have witnessed birds chasing each other and sometimes these chases resulting in one of the birds hitting a window.

SOLUTIONS

Given the magnitude of bird-window collision impacts, there are obviously great opportunities for reducing and minimizing these impacts going forward. Existing structures can be modified or retrofitted to reduce impacts, and proposed new structures can be more carefully sited and designed to minimize impacts. However, the costs of some of these measures can be high and can vary greatly, but most importantly the efficacies of many of these measures remain uncertain. Both the costs and effectiveness of all of these measures can be better understood through experimentation and careful scientific investigation. Post-construction fatality monitoring should be an essential feature of any new building project. Below is a listing of mitigation options, along with some notes and findings from the literature.

(1) Retrofitting to reduce impacts
(1A) Marking windows
(1B) Managing outdoor landscape vegetation
(1C) Managing indoor landscape vegetation
(1D) Managing nocturnal lighting

(1A) Marking windows.—Whereas Klem (1990) found no deterrent effect from decals on windows, Johnson and Hudson (1976) reported a fatality reduction of about 67% after placing decals on windows. Many external and internal glass markers have been tested experimentally, some showing no effect and some showing strong deterrent effects (Klem 1989, 1990, 2009, 2011; Klem and Saenger 2013; Rössler et al. 2015). In an experiment of opportunity, Ocampo-Peñuela et al. (2016) found only 2 of 86 fatalities at one of 6 buildings – the only building with windows treated with a bird deterrent film.

(2) Siting and Designing to minimize impacts
(2A) Deciding on location of structure
(2B) Deciding on façade and orientation
(2C) Selecting type and sizes of windows
(2D) Designing to minimize transparency through two parallel facades
(2E) Designing to minimize views of interior plants
(2F) Landscaping to increase distances between windows and trees and shrubs

GUIDELINES ON BUILDING DESIGN

If the project goes forward, it should at a minimum adhere to available guidelines on building design intended to minimize collision hazards to birds. The American Bird Conservancy (ABC) produced an excellent set of guidelines recommending actions to: (1) Minimize use of glass; (2) Placing glass behind some type of screening (grilles, shutters, exterior shades); (3) Using glass with inherent properties to reduce collisions, such as patterns, window films, decals or tape; and (4) Turning off lights during migration seasons (Sheppard and Phillips 2015). The City of San Francisco (San Francisco Planning Department 2011) also has a set of building design guidelines, based on the excellent guidelines produced by the New York City Audubon Society (Orff et al.

2007). The ABC document and both the New York and San Francisco documents provide excellent alerting of potential bird-collision hazards as well as many visual examples. The San Francisco Planning Department's (2011) building design guidelines are more comprehensive than those of New York City, but they could have gone further. For example, the San Francisco guidelines probably should have also covered scientific monitoring of impacts as well as compensatory mitigation for impacts that could not be avoided, minimized or reduced.

Although the San Francisco Planning Department deserves to be commended for its building design guidelines, some of its guidelines are in need of further review and consideration. Scientific research and understanding of the bird-window collision impacts remain low on the learning-curve, so we should expect rapid advances in understanding and solutions as scientific investigations are better funded and monitoring efforts expand and experimentation is implemented. At the time of the 2011 guidelines, only one building had been scientifically monitored for bird-window collisions (Kahle et al. 2016), so very few local scientific data on the impacts were available in the San Francisco Bay Area. As a result, too many of the guidelines are based on anecdotes and speculation. For example, the bird collision zone of 0-60 feet above ground (San Francisco Planning Department 2011:28) appears to have been based on speculation. No doubt low-rise buildings can kill many birds annually, but the evidence of this does not preclude high-rises from also killing many birds annually. When it comes to high-rises, it has often been difficult to determine how high a bird was flying when it collided with the building. Collision victims are found at the base of the building and could have fallen from 1 to 6 stories up, or perhaps from 7 to 40 stories up. It needs to be recognized that although the guidelines are commendable as a starting point, much remains to be learned about bird-window collisions, and flexibility for considering other measures or revised measures is warranted.

The EIR should be revised to address available building design standards developed for reducing or minimizing collisions.

WILDLIFE MOVEMENT

City of Santa Clara's conclusion that the project would not interfere with wildlife movement in the region is based on a false CEQA standard. According to City of Santa Clara (2018a:59), "*The project site is not used as a wildlife corridor*." The CEQA standard is whether a project will "*Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors*..." The primary phrase of the standard goes to wildlife movement regardless of whether the movement is channeled by a corridor. In fact, whereas natural corridors sometimes exist, the corridor concept mostly applies to human landscape engineering to reduce the effects of habitat fragmentation (Smallwood 2015). Wildlife movement in the region is often diffuse rather than channeled (Runge et al. 2014, Taylor et al. 2011), and includes stop-over habitat used by birds and bats (Taylor et al. 2011), staging habitat (Warnock 2010), and crossover habitat used by nonvolant wildlife during dispersal, migration or home range patrol. The false standard

used by City of Santa Clara was whether the project site serves as a corridor. No source is provided for this standard. Other forms of wildlife movement in a region are not addressed at all. The EIR should be revised to adequately address the project's potential impacts on wildlife movement.

TRAFFIC IMPACTS ON WILDLIFE

City of Santa Clara (2018a,b) provides no analysis of wildlife impacts caused by the project's generation of 12,044 daily car and truck trips. It is inconceivable, however, that generating this level of additional automobile traffic on regional roads would not crush and kill a substantial number of terrestrial wildlife, including members of special-status species. Special-status species vulnerable to car and truck impacts in the region are exemplified by Alameda whipsnake (*Masticophis lateralis euryxanthus*), California red-legged frog (*Rana draytonii*), California tiger salamander (*Ambystoma californiense*), and American badger (*Taxidea taxus*), which, although unlikely living on the project site, must cross roadways that will experience increased traffic volume caused by the project (Table 1). The project's impacts on wildlife will reach as far from the project as vehicles travel to or from the project site, and some of this travel will be through areas where these species live, such as in the coast range mountains east and south of the project site.

Vehicle collisions have accounted for the deaths of many thousands of reptile, amphibian, mammal, bird, and arthropod fauna, and the impacts have often been found to be significant at the population level (Forman et al. 2003). Increased use of existing roads will increase wildlife fatalities (see Figure 7 in Kobylarz 2001). It is possible that project-related traffic impacts will far exceed the impacts of land conversion to commercial use. But not one word of traffic-related impacts appears in City of Santa Clara (2018a, b).

Many thousands of roadkill wildlife incidents have been reported to the UC Davis Road Ecology Center (Shilling et al. 2017). In 2017, one of the major hotspots of road-killed wildlife overlaps the project site (Shilling et al. 2017). In fact, the wildlife roadkill hotspot in the project area was found to be possibly highly significant (see Figure 5 of Shilling et al. 2017 or Figure 4 of Shilling et al. 2018). The costs to drivers is also high (Shilling et al. 22017). The EIR needs to be revised to assess wildlife mortality that will be caused by increased traffic on existing roadways, and it should provide mitigation measures.

CUMULATIVE IMPACTS

City of Santa Clara's (2018a:61) scope of its cumulative effects analysis was too vague. The "surrounding area" is insufficient description. Is the surrounding area the neighboring street blocks? A 1-mile distance radius? City of Santa Clara?

City of Santa Clara (2018a:61) then dismissed cumulative impacts by arguing the project is located in an urban area devoid of sensitive habitat. Here again City of Santa Clara

invents a CEQA standard that does not exist. Where in CEQA is there a standard that sensitive habitat is a prerequisite condition for a project causing cumulative impacts on wildlife? City of Santa Clara's standard makes little sense in the context of the definition of habitat, which is that part of the environment used by a particular species (Hall et al. 1997, Morrison et al. 1998). If a species needs to use a highly disturbed, isolated parcel of land, then that land is habitat.

Special-status species of wildlife are finding habitat in the area of the proposed project, as evidenced by a decades-long study of burrowing owls at the Airport, and by eBird postings of 27 special-status species all around the project site. A more appropriate conclusion would have been that the project will contribute cumulative effects by (1) removing one of the last remaining patches of open space available to wildlife in the area, and (2) installing additional collision barriers to birds attempting to move through the area's airspace.

City of Santa Clara implies that cumulative impacts are really residual impacts left over from inadequate mitigation at projects, and then claims that other projects in the area mitigated their impacts to comply with state and federal regulations, leaving no cumulative effects to worry about. The notion of residual impact being the source of cumulative effects is inconsistent with CEQA's definition of cumulative effects. Individually mitigated projects do not negate the significance of cumulative impacts. If they did, then CEQA would not require a cumulative effects analysis. The City's follow-up notion that because other projects in the area mitigated their individual impacts thereby leaving no cumulative effects to worry about, is absurd. Other projects in the area have cumulatively left very little open space for wildlife to use within San Jose and Santa Clara. The sprawl of these Cities epitomizes the concept of cumulative effects, whereby projects in these cities have cumulatively left the remaining trees and patches of open space as desperate last refuges for some special-status species (most such species have long since been extirpated). The largest remaining population of burrowing owls in the region clings to life at the Airport, only 400 m from the project site, because so many other projects in the region have driven burrowing owls away and reduced their numerical capacity. Cumulative effects from the type of sprawl across these cities is akin to a game of musical chairs in which cumulative impacts escalate with each new project eliminating yet another chair – burrowing owls are down to their last chair in the region. What will the project's tall buildings do to burrowing owls' perception of the Airport as suitable habitat? If peregrine falcons hunt from the project's buildings, using them as perches and blinds, then burrowing owls at the Airport are liable to be wiped out. City of Santa Clara needs to perform a serious cumulative effects analysis.

MITIGATION

Preconstruction surveys for nesting birds

This measure is the only mitigation proposed for the project. However, it fails to mitigate impacts to highly philopatric species of birds beyond allowing breeding to succeed during the year of construction. Most species of bird return to the same nest sites inter-annually (Newton 1979, Kochert and Steenhof 2012), so most birds breeding on the project site will permanently lose the only breeding site they ever knew. Other breeding sites are already occupied by other birds, so at minimum the project would reduce breeding capacity by the acreage of the habitat destroyed, and most likely it would reduce breeding capacity further due to the effects of habitat fragmentation (Smallwood 2015). The EIR should be revised to more seriously consider mitigation measures for the project's likely impacts on breeding birds, and it should consider compensatory mitigation.

RECOMMENDED MEASURES

I suggest that the EIR be revised for this proposed project, and that it considers the following measures.

Window Collisions

The bird-collision impacts potentially caused by the project could be mitigated to less than significant levels by implementing three measures:

1. Adhere to available building design guidelines and to any other avoidance and minimization measures cited above;

2. Fund long-term scientific monitoring of the impact so that lessons learned can be applied to future projects or perhaps to effective retrofit solutions; and,

3. Offset impacts that could not be avoided, minimized or reduced by compensating for the impacts. Compensation can include habitat protections elsewhere or donations to wildlife rehabilitation facilities that will likely receive and care for injured birds.

Detection Surveys

The City of Santa Clara should implement the available protocols and guidelines on detection surveys for special-status species of wildlife that use the site for both nesting and migration stop-over. Detection surveys are needed to inform preconstruction take-avoidance surveys and to inform the formulation of appropriate mitigation measures.

Compensation for Lost Nesting and Stop-over Habitat

Preconstruction surveys and construction timing would fail to mitigate impacts to highly philopatric species of birds beyond allowing breeding to succeed during the year of construction. Most species of bird return to the same nest sites inter-annually (Newton 1979, Kochert and Steenhof 2012), so most birds breeding on the project site will permanently lose the only breeding site they ever knew. Other breeding sites are already occupied by other birds, so at minimum the project would reduce breeding capacity by the acreage of the habitat destroyed, and most likely it would reduce breeding capacity further due to the effects of habitat fragmentation (Smallwood 2015). A similar loss of habitat capacity would adversely affect all birds using the site as stop-over habitat during migration and home-range tenure. The EIR should be revised to more seriously consider mitigation measures for the project's likely impacts on breeding birds and birds stopping over, and it should consider compensatory mitigation.

Fund Wildlife Rehabilitation Facilities

Wildlife will be killed and injured by collisions with project-generated traffic and the buildings windows associated. The impacts to injured wildlife can be rectified by helping to pay the costs of wildlife rehabilitation facilities, which operate on volunteer support and inadequate budgets. Leyvas and Smallwood (2015) surveyed 38 rehabilitation facilities to assess the cost of rehabilitating raptors injured by wind turbines, and recommend $3,230/injured raptor would serve as a reasonable interim mitigation cost. However, wildlife injured by stray cats or vehicles traveling to and from the project will include animals other than raptors. Most of these non-raptor animals likely cost less to rehabilitate or to care for until those who cannot be released or placed in the care of others need to be euthanized humanely. In the absence of any additional cost summaries from rehabilitation facilities, I hazard to guess that $500 per injured animal would be reasonable.

The next challenge is estimating how many animals will require treatment during the life of the project. Live, injured animals will contribute directly to the costs incurred by rehabilitation facilities receiving the animals, but animals killed outright by cats and vehicles should also be mitigated through one or more compensatory measures. Compensating for animals that are killed can come in the form of rehabilitating animals that were injured by other projects or anthropogenic activities. As a starting point, I suggest assessing $100 per project-caused fatality. Still, there has yet to be a basis for multiplying these dollar amounts by the numbers of killed and injured wildlife caused by the project. And it should be remembered that most of the animals killed will never be documented.

There are two ways that project impacts can be assessed for deciding upon a rehabilitation fee. One way is to predict project-level impacts, but this prediction would be highly uncertain. One could use fatality and injury rates from available studies. A projected injury rate could be multiplied by $3,230 per raptor and $500 per non-raptor, and a projected fatality rate could be multiplied by $100 per fatality. So, perhaps for

every animal found injured at the project site and delivered to a rehabilitation facility, the cost for the injury is paid ($3230 per raptor and $500 per non-raptor) plus $2,500 is paid for all the projected dead animals per injured animal.

The second way to assess the impact is to fund scientific monitoring. This second way would necessitate a delay in establishing the cost-basis of the mitigation fee, but learning about the impacts would make the delay worthwhile. As scientific monitoring proceeds, a mitigation fee can be paid based on the injuries and fatalities that are found. Upon completion of the monitoring, an annual fee would be paid based on the average annual findings from the monitoring effort. I suggest splitting a fund among multiple wildlife rehabilitation facilities in the region.

Thank you for your attention,

_____
Shawn Smallwood, Ph.D.

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Curriculum Vitae

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Born May 3, 1963 in Sacramento, California. Married, father of two.

Ecologist

Expertise

- Finding solutions to controversial problems related to wildlife interactions with human industry, infrastructure, and activities;

- Using systems analysis and experimental design principles to identify meaningful ecological patterns that can inform management decisions.

Education

Ph.D. Ecology, University of California, Davis. September 1990.
M.S. Ecology, University of California, Davis. June 1987.
B.S. Anthropology, University of California, Davis. June 1985.
Corcoran High School, Corcoran, California. June 1981.

Experience

- 443 professional publications, including:
- 80 peer reviewed publications
- 24 in non-reviewed proceedings
- 337 reports, declarations, posters and book reviews
- 8 in mass media outlets
- 84 public presentations of research results at meetings
- Reviewed many professional papers and reports
- Testified in 4 court cases.

Editing for scientific journals: Guest Editor, *Wildlife Society Bulletin*, 2012-2013, of invited papers representing international views on the impacts of wind energy on wildlife and how to mitigate the impacts. Associate Editor, *Journal of Wildlife Management*, March 2004 to 30 June 2007. Editorial Board Member, *Environmental Management*, 10/1999 to 8/2004. Associate Editor, *Biological Conservation*, 9/1994 to 9/1995.

Member, Alameda County Scientific Review Committee (SRC), August 2006 to April 2011. The five-member committee investigated the causes of bird and bat collisions in the Altamont Pass Wind Resource Area, and recommended mitigation and monitoring measures. The SRC

reviewed the science underlying the Alameda County Avian Protection Program, and advised the County on how to reduce wildlife fatalities.

Consulting Ecologist, 2004-2007, California Energy Commission (CEC). Provided consulting services as needed to the CEC on renewable energy impacts, monitoring and research, and produced several reports. Also collaborated with Lawrence-Livermore National Lab on research to understand and reduce wind turbine impacts on wildlife.

Consulting Ecologist, 1999-2013, U.S. Navy. Performed endangered species surveys, hazardous waste site monitoring, and habitat restoration for the endangered San Joaquin kangaroo rat, California tiger salamander, California red-legged frog, California clapper rail, western burrowing owl, salt marsh harvest mouse, and other species at Naval Air Station Lemoore; Naval Weapons Station, Seal Beach, Detachment Concord; Naval Security Group Activity, Skaggs Island; National Radio Transmitter Facility, Dixon; and, Naval Outlying Landing Field Imperial Beach.

Part-time Lecturer, 1998-2005, California State University, Sacramento. Taught Contemporary Environmental Issues, Natural Resources Conservation (twice), Mammalogy, Behavioral Ecology, and Ornithology Lab.

Senior Ecologist, 1999-2005, BioResource Consultants. Designed and implemented research and monitoring studies related to avian fatalities at wind turbines, avian electrocutions on electric distribution poles across California, and avian fatalities at transmission lines.

Systems Ecologist, 1996 to present, Consulting in the Public Interest, www.cipi.com. Member of a multi-disciplinary consortium of scientists facilitating large-scale, environmental planning projects and litigation. We provide risk assessments, assessments of management practices, and expert witness testimony.

Chairman, Conservation Affairs Committee, The Wildlife Society--Western Section, 1999-2001. Prepared position statements and led efforts directed toward conservation issues, including travel to Washington, D.C. to lobby Congress for more wildlife conservation funding.

Systems Ecologist, 1995-2000, Institute for Sustainable Development. Headed ISD's program on integrated resources management. Developed indicators of ecological integrity for large areas, using remotely sensed data, local community involvement and GIS.

Associate, 1997-1998, Department of Agronomy and Range Science, University of California, Davis. Worked with Shu Geng and Mingua Zhang on several studies related to wildlife interactions with agriculture and patterns of fertilizer and pesticide residues in groundwater across a large landscape.

Lead Scientist, 1996-1999, National Endangered Species Network. Headed NESN's efforts to inform academic scientists and environmental activists about emerging issues regarding the Endangered Species Act and other environmental laws pertaining to special-status species. Also testified at public hearings on behalf of environmental groups and endangered species.

Ecologist, 1997-1998, Western Foundation of Vertebrate Zoology. Conducted field research to

determine the impact of past mercury mining on the status of California red-legged frogs in Santa Clara County, California.

Senior Systems Ecologist, 1994-1995, EIP Associates, Sacramento, California. Provided consulting services in environmental planning. Developed quantitative assessment of land units for their conservation and restoration opportunities, using the ecological resource requirements of 29 special-status species. Developed ecological indicators for prioritizing areas within Yolo County to receive mitigation funds for habitat easements and restoration.

Post-Graduate Researcher, 1990-1994, Department of Agronomy and Range Science*, U.C. Davis*. Under the mentorship of Dr. Shu Geng, studied landscape and management effects on temporal and spatial patterns of abundance among pocket gophers and species of Falconiformes and Carnivora in the Sacramento Valley. Also managed and analyzed a data base of energy use in California agriculture, and assisted with a landscape (GIS) study of groundwater contamination across Tulare County, California.

Work experience in graduate school: Co-taught Conservation Biology with Dr. Christine Schonewald, 1991 & 1993, UC Davis Graduate Group in Ecology; Reader for Dr. Richard Coss's course on Psychobiology in 1990, UC Davis Department of Psychology; Research Assistant to Dr. Walter E. Howard, 1988-1990, UC Davis Department of Wildlife and Fisheries Biology, testing durable baits for pocket gopher management in forest clearcuts; Research Assistant to Dr. Terrell P. Salmon, 1987-1988, UC Wildlife Extension, Department of Wildlife and Fisheries Biology, developing empirical models of mammal and bird invasions in North America, and a rating system for priority research and control of exotic species based on economic, environmental and human health hazards in California. Student Assistant to Dr. E. Lee Fitzhugh, 1985-1987, UC Cooperative Extension, Department of Wildlife and Fisheries Biology, developing and implementing a statewide mountain lion track count for long-term monitoring of numbers and distribution.

Fulbright Research Fellow, Indonesia, 1988. Tested use of new sampling methods for numerical monitoring of Sumatran tiger and six other species of endemic felids, and evaluated methods used by other researchers.

Projects

Repowering wind energy projects through careful siting of new wind turbines using map-based collision hazard models to minimize impacts to volant wildlife. Funded by wind companies (principally NextEra Renewable Energy, Inc.), California Energy Commission and East Bay Regional Park District, I have collaborated with a GIS analyst and managed a crew of five field biologists performing golden eagle behavior surveys and nocturnal surveys on bats and owls. The goal is to quantify flight patterns for development of predictive models to more carefully site new wind turbines in repowering projects. Focused behavior surveys began May 2012 and continue. Collision hazard models have been prepared for seven wind projects, three of which were built. Planning for additional repowering projects is underway.

Test avian safety of new mixer-ejector wind turbine (MEWT). Designed and implemented a before-after, control-impact experimental design to test the avian safety of a new, shrouded wind turbine developed by Ogin Inc. (formerly known as FloDesign Wind Turbine Corporation). Supported by a

$718,000 grant from the California Energy Commission's Public Interest Energy Research program and a 20% match share contribution from Ogin, I managed a crew of seven field biologists who performed periodic fatality searches and behavior surveys, carcass detection trials, nocturnal behavior surveys using a thermal camera, and spatial analyses with the collaboration of a GIS analyst. Field work began 1 April 2012 and ended 30 March 2015 without Ogin installing its MEWTs, but we still achieved multiple important scientific advances.

Reduce avian mortality due to wind turbines at Altamont Pass. Studied wildlife impacts caused by 5,400 wind turbines at the world's most notorious wind resource area. Studied how impacts are perceived by monitoring and how they are affected by terrain, wind patterns, food resources, range management practices, wind turbine operations, seasonal patterns, population cycles, infrastructure management such as electric distribution, animal behavior and social interactions.

Reduce avian mortality on electric distribution poles. Directed research toward reducing bird electrocutions on electric distribution poles, 2000-2007. Oversaw 5 founds of fatality searches at 10,000 poles from Orange County to Glenn County, California, and produced two large reports.

Cook *et al*. v. Rockwell International *et al*., No. 90-K-181 (D. Colorado). Provided expert testimony on the role of burrowing animals in affecting the fate of buried and surface-deposited radioactive and hazardous chemical wastes at the Rocky Flats Plant, Colorado. Provided expert reports based on four site visits and an extensive document review of burrowing animals. Conducted transect surveys for evidence of burrowing animals and other wildlife on and around waste facilities. Discovered substantial intrusion of waste structures by burrowing animals. I testified in federal court in November 2005, and my clients were subsequently awarded a $553,000,000 judgment by a jury. After appeals the award was increased to two billion dollars.

Hanford Nuclear Reservation Litigation. Provided expert testimony on the role of burrowing animals in affecting the fate of buried radioactive wastes at the Hanford Nuclear Reservation, Washington. Provided three expert reports based on three site visits and extensive document review. Predicted and verified a certain population density of pocket gophers on buried waste structures, as well as incidence of radionuclide contamination in body tissue. Conducted transect surveys for evidence of burrowing animals and other wildlife on and around waste facilities. Discovered substantial intrusion of waste structures by burrowing animals.

Expert testimony and declarations on proposed residential and commercial developments, gas-fired power plants, wind, solar and geothermal projects, water transfers and water transfer delivery systems, endangered species recovery plans, Habitat Conservation Plans and Natural Communities Conservation Programs. Testified before multiple government agencies, Tribunals, Boards of Supervisors and City Councils, and participated with press conferences and depositions. Prepared expert witness reports and court declarations, which are summarized under Reports (below).

Protocol-level surveys for special-status species. Used California Department of Fish and Wildlife and US Fish and Wildlife Service protocols to search for California red-legged frog, California tiger salamander, arroyo southwestern toad, blunt-nosed leopard lizard, western pond turtle, giant kangaroo rat, San Joaquin kangaroo rat, San Joaquin kit fox, western burrowing owl, Swainson's hawk, Valley elderberry longhorn beetle and other special-status species.

Conservation of San Joaquin kangaroo rat. Performed research to identify factors responsible for the

decline of this endangered species at Lemoore Naval Air Station, 2000-2013, and implemented habitat enhancements designed to reverse the trend and expand the population.

Impact of West Nile Virus on yellow-billed magpies. Funded by Sacramento-Yolo Mosquito and Vector Control District, 2005-2008, compared survey results pre- and post-West Nile Virus epidemic for multiple bird species in the Sacramento Valley, particularly on yellow-billed magpie and American crow due to susceptibility to WNV.

Workshops on HCPs. Assisted Dr. Michael Morrison with organizing and conducting a 2-day workshop on Habitat Conservation Plans, sponsored by Southern California Edison, and another 1-day workshop sponsored by PG&E. These Workshops were attended by academics, attorneys, and consultants with HCP experience. We guest-edited a Proceedings published in Environmental Management.

Mapping of biological resources along Highways 101, 46 and 41. Used GPS and GIS to delineate vegetation complexes and locations of special-status species along 26 miles of highway in San Luis Obispo County, 14 miles of highway and roadway in Monterey County, and in a large area north of Fresno, including within reclaimed gravel mining pits.

GPS mapping and monitoring at restoration sites and at Caltrans mitigation sites. Monitored the success of elderberry shrubs at one location, the success of willows at another location, and the response of wildlife to the succession of vegetation at both sites. Also used GPS to monitor the response of fossorial animals to yellow star-thistle eradication and natural grassland restoration efforts at Bear Valley in Colusa County and at the decommissioned Mather Air Force Base in Sacramento County.

Mercury effects on Red-legged Frog. Assisted Dr. Michael Morrison and US Fish and Wildlife Service in assessing the possible impacts of historical mercury mining on the federally listed California red-legged frog in Santa Clara County. Also measured habitat variables in streams.

Opposition to proposed No Surprises rule. Wrote a white paper and summary letter explaining scientific grounds for opposing the incidental take permit (ITP) rules providing ITP applicants and holders with general assurances they will be free of compliance with the Endangered Species Act once they adhere to the terms of a "properly functioning HCP." Submitted 188 signatures of scientists and environmental professionals concerned about No Surprises rule US Fish and Wildlife Service, National Marine Fisheries Service, all US Senators.

Natomas Basin Habitat Conservation Plan alternative. Designed narrow channel marsh to increase the likelihood of survival and recovery in the wild of giant garter snake, Swainson's hawk and Valley Elderberry Longhorn Beetle. The design included replication and interspersion of treatments for experimental testing of critical habitat elements. I provided a report to Northern Territories, Inc.

Assessments of agricultural production system and environmental technology transfer to China. Twice visited China and interviewed scientists, industrialists, agriculturalists, and the Directors of the Chinese Environmental Protection Agency and the Department of Agriculture to assess the need and possible pathways for environmental clean-up technologies and trade opportunities between the US and China.

Yolo County Habitat Conservation Plan. Conducted landscape ecology study of Yolo County to spatially prioritize allocation of mitigation efforts to improve ecosystem functionality within the County from the perspective of 29 special-status species of wildlife and plants. Used a hierarchically structured indicators approach to apply principles of landscape and ecosystem ecology, conservation biology, and local values in rating land units. Derived GIS maps to help guide the conservation area design, and then developed implementation strategies.

Mountain lion track count. Developed and conducted a carnivore monitoring program throughout California since 1985. Species counted include mountain lion, bobcat, black bear, coyote, red and gray fox, raccoon, striped skunk, badger, and black-tailed deer. Vegetation and land use are also monitored. Track survey transect was established on dusty, dirt roads within randomly selected quadrats.

Sumatran tiger and other felids. Upon award of Fulbright Research Fellowship, I designed and initiated track counts for seven species of wild cats in Sumatra, including Sumatran tiger, fishing cat, and golden cat. Spent four months on Sumatra and Java in 1988, and learned Bahasa Indonesia, the official Indonesian language.

Wildlife in agriculture. Beginning as post-graduate research, I studied pocket gophers and other wildlife in 40 alfalfa fields throughout the Sacramento Valley, and I surveyed for wildlife along a 200 mile road transect since 1989 with a hiatus of 1996-2004. The data are analyzed using GIS and methods from landscape ecology, and the results published and presented orally to farming groups in California and elsewhere. I also conducted the first study of wildlife in cover crops used on vineyards and orchards.

Agricultural energy use and Tulare County groundwater study. Developed and analyzed a data base of energy use in California agriculture, and collaborated on a landscape (GIS) study of groundwater contamination across Tulare County, California.

Pocket gopher damage in forest clear-cuts. Developed gopher sampling methods and tested various poison baits and baiting regimes in the largest-ever field study of pocket gopher management in forest plantations, involving 68 research plots in 55 clear-cuts among 6 National Forests in northern California.

Risk assessment of exotic species in North America. Developed empirical models of mammal and bird species invasions in North America, as well as a rating system for assigning priority research and control to exotic species in California, based on economic, environmental, and human health hazards.

Representative Clients/Funders

Law Offices of Stephan C. Volker
Eric K. Gillespie Professional Corporation
Law Offices of Berger & Montague
Lozeau | Drury LLP
Law Offices of Roy Haber
Law Offices of Edward MacDonald
Law Office of John Gabrielli
Law Office of Bill Kopper
Law Office of Donald B. Mooney
Law Office of Veneruso & Moncharsh
Law Office of Steven Thompson
Law Office of Brian Gaffney
California Wildlife Federation
Defenders of Wildlife
Sierra Club
National Endangered Species Network
Spirit of the Sage Council
The Humane Society
Hagens Berman LLP
Environmental Protection Information Center
Goldberg, Kamin & Garvin, Attorneys at Law
Californians for Renewable Energy (CARE)
Seatuck Environmental Association
Friends of the Columbia Gorge, Inc.
Save Our Scenic Area
Alliance to Protect Nantucket Sound
Friends of the Swainson's Hawk
Alameda Creek Alliance
Center for Biological Diversity
California Native Plant Society
Endangered Wildlife Trust
and BirdLife South Africa
AquAlliance
Oregon Natural Desert Association
Save Our Sound
G3 Energy and Pattern Energy
Emerald Farms
Pacific Gas & Electric Co.
Southern California Edison Co.
Georgia-Pacific Timber Co.
Northern Territories Inc.
David Magney Environmental Consulting
Wildlife History Foundation
NextEra Energy Resources, LLC
FloDesign Wind Turbine
EDF Renewables
National Renewable Energy Lab
Altamont Winds LLC
Comstocks Business (magazine)
BioResource Consultants
Tierra Data
Black and Veatch
Terry Preston, Wildlife Ecology Research Center
EcoStat, Inc.
US Navy
US Department of Agriculture
US Forest Service
US Fish & Wildlife Service
US Department of Justice
California Energy Commission
California Office of the Attorney General
California Department of Fish & Wildlife
California Department of Transportation
California Department of Forestry
California Department of Food & Agriculture
Ventura County Counsel
County of Yolo
Tahoe Regional Planning Agency
Sustainable Agriculture Research & Education Program
Sacramento-Yolo Mosquito and Vector Control District
East Bay Regional Park District
County of Alameda
Don & LaNelle Silverstien
Seventh Day Adventist Church
Escuela de la Raza Unida
Susan Pelican and Howard Beeman
Residents Against Inconsistent Development, Inc.
Bob Sarvey
Mike Boyd
Hillcroft Neighborhood Fund
Joint Labor Management Committee, Retail Food Industry
Lisa Rocca
Kevin Jackson
Dawn Stover and Jay Letto
Nancy Havassy
Catherine Portman (for Brenda Cedarblade)
Ventus Environmental Solutions, Inc.
Panorama Environmental, Inc.
Adams Broadwell Professional Corporation

Representative special-status species experience

Common name	Species name	Description
Field experience		
California red-legged frog	*Rana aurora draytonii*	Protocol searches; Many detections
Foothill yellow-legged frog	*Rana boylii*	Presence surveys; Many detections
Western spadefoot	*Spea hammondii*	Presence surveys; Few detections
California tiger salamander	*Ambystoma californiense*	Protocol searches; Many detections
Coast range newt	*Taricha torosa torosa*	Searches and multiple detections
Blunt-nosed leopard lizard	*Gambelia sila*	Detected in San Luis Obispo County
California horned lizard	*Phrynosoma coronatum frontale*	Searches; Many detections
Western pond turtle	*Clemmys marmorata*	Searches; Many detections
San Joaquin kit fox	*Vulpes macrotis mutica*	Protocol searches; detections
Sumatran tiger	*Panthera tigris*	Research in Sumatra
Mountain lion	*Puma concolor californicus*	Research and publications
Point Arena mountain beaver	*Aplodontia rufa nigra*	Remote camera operation
Giant kangaroo rat	*Dipodomys ingens*	Detected in Cholame Valley
San Joaquin kangaroo rat	*Dipodomys nitratoides*	Research, conservation at NAS Lemoore
Monterey dusky-footed woodrat	*Neotoma fuscipes luciana*	Non-target captures and mapping of dens
Salt marsh harvest mouse	*Reithrodontomys raviventris*	Habitat assessment, monitoring
Salinas harvest mouse	*Reithrodontomys megalotus distichlus*	Captures; habitat assessment
California clapper rail	*Rallus longirostris*	Surveys and detections
Golden eagle	*Aquila chrysaetos*	Research in Altamont Pass
Swainson's hawk	*Buteo swainsoni*	Research in Sacramento Valley
Northern harrier	*Circus cyaeneus*	Research and publication
White-tailed kite	*Elanus leucurus*	Research and publication
Loggerhead shrike	*Lanius ludovicianus*	Research in Sacramento Valley
Least Bell's vireo	*Vireo bellii pusillus*	Detected in Monterey County
Willow flycatcher	*Empidonax traillii extimus*	Research at Sierra Nevada breeding sites
Burrowing owl	*Athene cunicularia hypugia*	Research at multiple locations
Valley elderberry longhorn beetle	*Desmocerus californicus dimorphus*	Research and publication
Analytical		
Arroyo southwestern toad	*Bufo microscaphus californicus*	Research and report.
Giant garter snake	*Thamnophis gigas*	Research and publication
Northern goshawk	*Accipiter gentilis*	Research and publication
Northern spotted owl	*Strix occidentalis*	Research and reports
Alameda whipsnake	*Masticophis lateralis euryxanthus*	Expert testimony

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Comments on Environmental Documents

I was retained or commissioned to comment on environmental planning and review documents, including:

- Comments on proposed rule for incidental eagle take (2016, 49 pp);
- Revised Draft Giant Garter Snake Recovery Plan of 2015 (2016, 18 pp);
- Supplementary Reply Witness Statement Amherst Island Wind Farm, Ontario (2015, 38 pp);
- Witness Statement on Amherst Island Wind Farm, Ontario (2015, 31 pp);
- Second Reply Witness Statement on White Pines Wind Farm, Ontario (2015, 6 pp);
- Reply Witness Statement on White Pines Wind Farm, Ontario (2015, 10 pp);
- Witness Statement on White Pines Wind Farm, Ontario (2015, 9 pp);
- Proposed Section 24 Specific Plan Agua Caliente Band of Cahuilla Indians DEIS (2015, 9 pp);

- Replies to comments 24 Specific Plan Agua Caliente Band of Cahuilla Indians FEIS (2015, 6 pp);
- Sierra Lakes Commerce Center Project DEIR (2015, 9 pp);
- West Valley Logistics Center Specific Plan DEIR(2015, 10 pp);
- World Logistic Center Specific Plan FEIR (2015, 12 pp);
- Bay Delta Conservation Plan EIR/EIS (2014, 21 pp);
- Addison Wind Energy Project DEIR (2014, 32 pp);
- Response to Comments on the Addison Wind Energy Project DEIR (2014, 15 pp);
- Addison and Rising Tree Wind Energy Project FEIR (2014, 12 pp);
- Alta East Wind Energy Project FEIS (2013, 23 pp);
- Blythe Solar Power Project Staff Assessment, California Energy Commission (2013, 16 pp);
- Clearwater and Yakima Solar Projects DEIR (2013, 9 pp);
- Cuyama Solar Project DEIR (2014, 19 pp);
- Draft Desert Renewable Energy Conservation Plan (DRECP) EIR/EIS (2015, 49 pp);
- Kingbird Solar Photovoltaic Project EIR (2013, 19 pp);
- Lucerne Valley Solar Project Initial Study & Mitigated Negative Declaration (2013, 12 pp);
- Palen Solar Electric Generating System Final Staff Assessment of California Energy Commission, (2014, 20 pp);
- Rebuttal testimony on Palen Solar Energy Generating System (2014, 9 pp);
- Rising Tree Wind Energy Project DEIR (2014, 32 pp);
- Response to Comments on the Rising Tree Wind Energy Project DEIR (2014, 15 pp);
- Soitec Solar Development Project Draft PEIR (2014, 18 pp);
- Comment on the Biological Opinion (08ESMF-00-2012-F-0387) of Oakland Zoo expansion on Alameda whipsnake and California red-legged frog (2014; 3 pp);
- West Antelope Solar Energy Project Initial Study and Negative Declaration (2013, 18 pp);
- Willow Springs Solar Photovoltaic Project DEIR (2015, 28 pp);
- Alameda Creek Bridge Replacement Project DEIR (2015, 10 pp);
- Declaration on Tule Wind project FEIR/FEIS (2013; 24 pp);
- Sunlight Partners LANDPRO Solar Project Mitigated Negative Declaration (2013; 11 pp);
- Declaration in opposition to BLM fracking (2013; 5 pp);
- Rosamond Solar Project Addendum EIR (2013; 13 pp);
- Pioneer Green Solar Project EIR (2013; 13 pp);
- Reply to Staff Responses to Comments on Soccer Center Solar Project Mitigated Negative Declaration (2013; 6 pp);
- Soccer Center Solar Project Mitigated Negative Declaration (2013; 10 pp);
- Plainview Solar Works Mitigated Negative Declaration (2013; 10 pp);
- Reply to the County Staff's Responses on comments to Imperial Valley Solar Company 2 Project (2013; 10 pp);
- Imperial Valley Solar Company 2 Project (2013; 13 pp);
- FRV Orion Solar Project DEIR (PP12232) (2013; 9 pp);
- Casa Diablo IV Geothermal Development Project (3013; 6 pp);
- Reply to Staff Responses to Comments on Casa Diablo IV Geothermal Development Project (2013; 8 pp);
- FEIS prepared for Alta East Wind Project (2013; 23 pp);

- Metropolitan Air Park DEIR, City of San Diego (2013;);
- Davidon Homes Tentative Subdivision Map and Rezoning Project DEIR (2013; 9 pp);
- Analysis of Biological Assessment of Oakland Zoo Expansion Impacts on Alameda Whipsnake (2013; 10 pp);
- Declaration on Campo Verde Solar project FEIR (2013; 11pp);
- Neg Dec comments on Davis Sewer Trunk Rehabilitation (2013; 8 pp);
- Declaration on North Steens Transmission Line FEIS (2012; 62 pp);
- City of Lancaster Revised Initial Study for Conditional Use Permits 12-08 and 12-09, Summer Solar and Springtime Solar Projects (2012; 8 pp);
- J&J Ranch, 24 Adobe Lane Environmental Review (2012; 14 pp);
- Reply to the County Staff's Responses on comments to Hudson Ranch Power II Geothermal Project and the Simbol Calipatria Plant II (2012; 8 pp);
- Hudson Ranch Power II Geothermal Project and the Simbol Calipatria Plant II (2012; 9 pp);
- Desert Harvest Solar Project EIS (2012; 15 pp);
- Solar Gen 2 Array Project DEIR (2012; 16 pp);
- Ocotillo Sol Project EIS (2012; 4 pp);
- Beacon Photovoltaic Project DEIR (2012; 5 pp);
- Declaration on Initial Study and Proposed Negative Declaration for the Butte Water District 2012 Water Transfer Program (2012; 11 pp);
- Mount Signal and Calexico Solar Farm Projects DEIR (2011; 16 pp);
- City of Elk Grove Sphere of Influence EIR (2011; 28 pp);
- Comment on Sutter Landing Park Solar Photovoltaic Project MND (2011; 9 pp);
- Statement of Shawn Smallwood, Ph.D. Regarding Proposed Rabik/Gudath Project, 22611 Coleman Valley Road, Bodega Bay (CPN 10-0002) (2011; 4 pp);
- Declaration of K. Shawn Smallwood on Biological Impacts of the Ivanpah Solar Electric Generating System (ISEGS) (2011; 9 pp);
- Comments on Draft Eagle Conservation Plan Guidance (2011; 13 pp);
- Comments on Draft EIR/EA for Niles Canyon Safety Improvement Project (2011; 16 pp);
- Declaration of K. Shawn Smallwood, Ph.D., on Biological Impacts of the Route 84 Safety Improvement Project (2011; 7 pp);
- Rebuttal Testimony of Witness #22, K. Shawn Smallwood, Ph.D, on Behalf of Intervenors Friends of The Columbia Gorge & Save Our Scenic Area (2010; 6 pp);
- Prefiled Direct Testimony of Witness #22, K. Shawn Smallwood, Ph.D, on Behalf of Intervenors Friends of the Columbia Gorge & Save Our Scenic Area. Comments on Whistling Ridge Wind Energy Power Project DEIS, Skamania County, Washington (2010; 41 pp);
- Evaluation of Klickitat County's Decisions on the Windy Flats West Wind Energy Project (2010; 17 pp);
- St. John's Church Project Draft Environmental Impact Report (2010; 14 pp.);
- Initial Study/Mitigated Negative Declaration for Results Radio Zone File #2009-001 (2010; 20 pp);
- Rio del Oro Specific Plan Project Final Environmental Impact Report (2010;12 pp);
- Answers to Questions on 33% RPS Implementation Analysis Preliminary Results Report (2009: 9 pp);
- SEPA Determination of Non-significance regarding zoning adjustments for Skamania

County, Washington. Second Declaration to Friends of the Columbia Gorge, Inc. and Save Our Scenic Area (Dec 2008; 17 pp);

- Comments on Draft 1A Summary Report to CAISO (2008; 10 pp);
- County of Placer's Categorical Exemption of Hilton Manor Project (2009; 9 pp);
- Protest of CARE to Amendment to the Power Purchase and Sale Agreement for Procurement of Eligible Renewable Energy Resources Between Hatchet Ridge Wind LLC and PG&E (2009; 3 pp);
- Tehachapi Renewable Transmission Project EIR/EIS (2009; 142 pp);
- Delta Shores Project EIR, south Sacramento (2009; 11 pp + addendum 2 pp);
- Declaration of Shawn Smallwood in Support of Care's Petition to Modify D.07-09-040 (2008; 3 pp);
- The Public Utility Commission's Implementation Analysis December 16 Workshop for the Governor's Executive Order S-14-08 to implement a 33% Renewable Portfolio Standard by 2020 (2008; 9 pp);
- The Public Utility Commission's Implementation Analysis Draft Work Plan for the Governor's Executive Order S-14-08 to implement a 33% Renewable Portfolio Standard by 2020 (2008; 11 pp);
- Draft 1A Summary Report to California Independent System Operator for Planning Reserve Margins (PRM) Study (2008; 7 pp.);
- SEPA Determination of Non-significance regarding zoning adjustments for Skamania County, Washington. Declaration to Friends of the Columbia Gorge, Inc. and Save Our Scenic Area (Sep 2008; 16 pp);
- California Energy Commission's Preliminary Staff Assessment of the Colusa Generating Station (2007; 24 pp);
- Rio del Oro Specific Plan Project Recirculated Draft Environmental Impact Report (2008: 66 pp);
- Replies to Response to Comments Re: Regional University Specific Plan Environmental Impact Report (2008; 20 pp);
- Regional University Specific Plan Environmental Impact Report (2008: 33 pp.);
- Clark Precast, LLC's "Sugarland" project, Negative Declaration (2008: 15 pp.);
- Cape Wind Project Draft Environmental Impact Statement (2008; 157 pp.);
- Yuba Highlands Specific Plan (or Area Plan) Environmental Impact Report (2006; 37 pp.);
- Replies to responses to comments on Mitigated Negative Declaration of the proposed Mining Permit (MIN 04-01) and Modification of Use Permit 96-02 at North Table Mountain (2006; 5 pp);
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- Windy Point Wind Farm Environmental Review and EIS (2006; 14 pp and 36 Powerpoint slides in reply to responses to comments);
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- Negative Declaration of the proposed Callahan Estates Subdivision (2004; 11 pp);
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pp);

- On the petition California Fish and Game Commission to list the Burrowing Owl as threatened or endangered (2003; 10 pp);
- Conditional Use Permit renewals from Alameda County for wind turbine operations in the Altamont Pass Wind Resource Area (2003; 41 pp);
- UC Davis Long Range Development Plan of 2003, particularly with regard to the Neighborhood Master Plan (2003; 23 pp);
- Anderson Marketplace Draft Environmental Impact Report (2003: 18 pp + 3 plates of photos);
- Negative Declaration of the proposed expansion of Temple B'nai Tikyah (2003: 6 pp);
- Antonio Mountain Ranch Specific Plan Public Draft EIR (2002: 23 pp);
- Response to testimony of experts at the East Altamont Energy Center evidentiary hearing on biological resources (2002: 9 pp);
- Revised Draft Environmental Impact Report, The Promenade (2002: 7 pp);
- Recirculated Initial Study for Calpine's proposed Pajaro Valley Energy Center (2002: 3 pp);
- UC Merced -- Declaration of Dr. Shawn Smallwood in support of petitioner's application for temporary restraining order and preliminary injunction (2002: 5 pp);
- Replies to response to comments in Final Environmental Impact Report, Atwood Ranch Unit III Subdivision (2003: 22 pp);
- Draft Environmental Impact Report, Atwood Ranch Unit III Subdivision (2002: 19 pp + 8 photos on 4 plates);
- California Energy Commission Staff Report on GWF Tracy Peaker Project (2002: 17 pp + 3 photos; follow-up report of 3 pp);
- Initial Study and Negative Declaration, Silver Bend Apartments, Placer County (2002: 13 pp);
- UC Merced Long-range Development Plan DEIR and UC Merced Community Plan DEIR (2001: 26 pp);
- Initial Study, Colusa County Power Plant (2001: 6 pp);
- Comments on Proposed Dog Park at Catlin Park, Folsom, California (2001: 5 pp + 4 photos);
- Pacific Lumber Co. (Headwaters) Habitat Conservation Plan and Environmental Impact Report (1998: 28 pp);
- Final Environmental Impact Report/Statement for Issuance of Take authorization for listed species within the MSCP planning area in San Diego County, California (Fed. Reg. 62 (60): 14938, San Diego Multi-Species Conservation Program) (1997: 10 pp);
- Permit (PRT-823773) Amendment for the Natomas Basin Habitat Conservation Plan, Sacramento, CA (Fed. Reg. 63 (101): 29020-29021) (1998);
- Draft Recovery Plan for the Giant Garter Snake (*Thamnophis gigas*). (Fed. Reg. 64(176): 49497-49498) (1999: 8 pp);
- Review of the Draft Recovery Plan for the Arroyo Southwestern Toad (*Bufo microscaphus californicus*) (1998);
- Ballona West Bluffs Project Environmental Impact Report (1999: oral presentation);
- California Board of Forestry's proposed amended Forest Practices Rules (1999);
- Negative Declaration for the Sunset Skyranch Airport Use Permit (1999);
- Calpine and Bechtel Corporations' Biological Resources Implementation and Monitoring

Program (BRMIMP) for the Metcalf Energy Center (2000: 10 pp);

- California Energy Commission's Final Staff Assessment of the proposed Metcalf Energy Center (2000);
- US Fish and Wildlife Service Section 7 consultation with the California Energy Commission regarding Calpine and Bechtel Corporations' Metcalf Energy Center (2000: 4 pp);
- California Energy Commission's Preliminary Staff Assessment of the proposed Metcalf Energy Center (2000: 11 pp);
- Site-specific management plans for the Natomas Basin Conservancy's mitigation lands, prepared by Wildlands, Inc. (2000: 7 pp);
- Affidavit of K. Shawn Smallwood in Spirit of the Sage Council, et al. (Plaintiffs) vs. Bruce Babbitt, Secretary, U.S. Department of the Interior, et al. (Defendants), Injuries caused by the No Surprises policy and final rule which codifies that policy (1999: 9 pp).

Comments on other Environmental Review Documents:

- Proposed Regulation for California Fish and Game Code Section 3503.5 (2015: 12 pp);
- Statement of Overriding Considerations related to extending Altamont Winds, Inc.'s Conditional Use Permit PLN2014-00028 (2015; 8 pp);
- Draft Program Level EIR for Covell Village (2005; 19 pp);
- Bureau of Land Management Wind Energy Programmatic EIS Scoping document (2003: 7 pp.);
- NEPA Environmental Analysis for Biosafety Level 4 National Biocontainment Laboratory (NBL) at UC Davis (2003: 7 pp);
- Notice of Preparation of UC Merced Community and Area Plan EIR, on behalf of The Wildlife Society—Western Section (2001: 8 pp.);
- Preliminary Draft Yolo County Habitat Conservation Plan (2001; 2 letters totaling 35 pp.);
- Merced County General Plan Revision, notice of Negative Declaration (2001: 2 pp.);
- Notice of Preparation of Campus Parkway EIR/EIS (2001: 7 pp.);
- Draft Recovery Plan for the bighorn sheep in the Peninsular Range (*Ovis candensis*) (2000);
- Draft Recovery Plan for the California Red-legged Frog (*Rana aurora draytonii*), on behalf of The Wildlife Society—Western Section (2000: 10 pp.);
- Sierra Nevada Forest Plan Amendment Draft Environmental Impact Statement, on behalf of The Wildlife Society—Western Section (2000: 7 pp.);
- State Water Project Supplemental Water Purchase Program, Draft Program EIR (1997);
- Davis General Plan Update EIR (2000);
- Turn of the Century EIR (1999: 10 pp);
- Proposed termination of Critical Habitat Designation under the Endangered Species Act (Fed. Reg. 64(113): 31871-31874) (1999);
- NOA Draft Addendum to the Final Handbook for Habitat Conservation Planning and Incidental Take Permitting Process, termed the HCP 5-Point Policy Plan (Fed. Reg. 64(45): 11485 - 11490) (1999; 2 pp + attachments);
- Covell Center Project EIR and EIR Supplement (1997).

Position Statements I prepared the following position statements for the Western Section of The Wildlife Society, and one for nearly 200 scientists:

- Recommended that the California Department of Fish and Game prioritize the extermination of the introduced southern water snake in northern California. The Wildlife Society--Western Section (2001);
- Recommended that The Wildlife Society—Western Section appoint or recommend members of the independent scientific review panel for the UC Merced environmental review process (2001);
- Opposed the siting of the University of California's 10th campus on a sensitive vernal pool/grassland complex east of Merced. The Wildlife Society--Western Section (2000);
- Opposed the legalization of ferret ownership in California. The Wildlife Society--Western Section (2000);
- Opposed the Proposed "No Surprises," "Safe Harbor," and "Candidate Conservation Agreement" rules, including permit-shield protection provisions (Fed. Reg. Vol. 62, No. 103, pp. 29091-29098 and No. 113, pp. 32189-32194). This statement was signed by 188 scientists and went to the responsible federal agencies, as well as to the U.S. Senate and House of Representatives.

Posters at Professional Meetings

Leyvas, E. and K. S. Smallwood. 2015. Rehabilitating injured animals to offset and rectify wind project impacts. Conference on Wind Energy and Wildlife Impacts, Berlin, Germany, 9-12 March 2015.

Smallwood, K. S., J. Mount, S. Standish, E. Leyvas, D. Bell, E. Walther, B. Karas. 2015. Integrated detection trials to improve the accuracy of fatality rate estimates at wind projects. Conference on Wind Energy and Wildlife Impacts, Berlin, Germany, 9-12 March 2015.

Smallwood, K. S. and C. G. Thelander. 2005. Lessons learned from five years of avian mortality research in the Altamont Pass WRA. AWEA conference, Denver, May 2005.

Neher, L., L. Wilder, J. Woo, L. Spiegel, D. Yen-Nakafugi, and K.S. Smallwood. 2005. Bird's eye view on California wind. AWEA conference, Denver, May 2005.

Smallwood, K. S., C. G. Thelander and L. Spiegel. 2003. Toward a predictive model of avian fatalities in the Altamont Pass Wind Resource Area. Windpower 2003 Conference and Convention, Austin, Texas.

Smallwood, K.S. and Eva Butler. 2002. Pocket Gopher Response to Yellow Star-thistle Eradication as part of Grassland Restoration at Decommissioned Mather Air Force Base, Sacramento County, California. White Mountain Research Station Open House, Barcroft Station.

Smallwood, K.S. and Michael L. Morrison. 2002. Fresno kangaroo rat (*Dipodomys nitratoides*) Conservation Research at Resources Management Area 5, Lemoore Naval Air Station. White Mountain Research Station Open House, Barcroft Station.

Smallwood, K.S. and E.L. Fitzhugh. 1989. Differentiating mountain lion and dog tracks. Third Mountain Lion Workshop, Prescott, AZ.

Smith, T. R. and K. S. Smallwood. 2000. Effects of study area size, location, season, and allometry on reported *Sorex* shrew densities. Annual Meeting of the Western Section of The Wildlife Society.

Presentations at Professional Meetings and Seminars

Mitigation of Raptor Fatalities in the Altamont Pass Wind Resource Area. Raptor Research Foundation Meeting, Sacramento, California, 6 November 2015.

From burrows to behavior: Research and management for burrowing owls in a diverse landscape. California Burrowing Owl Consortium meeting, 24 October 2015, San Jose, California.

The Challenges of repowering. Keynote presentation at Conference on Wind Energy and Wildlife Impacts, Berlin, Germany, 10 March 2015.

Research Highlights Altamont Pass 2011-2015. Scientific Review Committee, Oakland, California, 8 July 2015.

Siting wind turbines to minimize raptor collisions: Altamont Pass Wind Resource Area. US Fish and Wildlife Service Golden Eagle Working Group, Sacramento, California, 8 January 2015.

Evaluation of nest boxes as a burrowing owl conservation strategy. Sacramento Chapter of the Western Section, The Wildlife Society. Sacramento, California, 26 August 2013.

Predicting collision hazard zones to guide repowering of the Altamont Pass. Conference on wind power and environmental impacts. Stockholm, Sweden, 5-7 February 2013.

Impacts of Wind Turbines on Wildlife. California Council for Wildlife Rehabilitators, Yosemite, California, 12 November 2012.

Impacts of Wind Turbines on Birds and Bats. Madrone Audubon Society, Santa Rosa, California, 20 February 2012.

Comparing Wind Turbine Impacts across North America. California Energy Commission Staff Workshop: Reducing the Impacts of Energy Infrastructure on Wildlife, 20 July 2011.

Siting Repowered Wind Turbines to Minimize Raptor Collisions. California Energy Commission Staff Workshop: Reducing the Impacts of Energy Infrastructure on Wildlife, 20 July 2011.

Siting Repowered Wind Turbines to Minimize Raptor Collisions. Alameda County Scientific Review Committee meeting, 17 February 2011

Comparing Wind Turbine Impacts across North America. Conference on Wind energy and Wildlife impacts, Trondheim, Norway, 3 May 2011.

Update on Wildlife Impacts in the Altamont Pass Wind Resource Area. Raptor Symposium, The Wildlife Society—Western Section, Riverside, California, February 2011.

Siting Repowered Wind Turbines to Minimize Raptor Collisions. Raptor Symposium, The Wildlife

Society - Western Section, Riverside, California, February 2011.

Wildlife mortality caused by wind turbine collisions. Ecological Society of America, Pittsburgh, Pennsylvania, 6 August 2010.

Map-based repowering and reorganization of a wind farm to minimize burrowing owl fatalities. California burrowing Owl Consortium Meeting, Livermore, California, 6 February 2010.

Environmental barriers to wind power. Getting Real About Renewables: Economic and Environmental Barriers to Biofuels and Wind Energy. A symposium sponsored by the Environmental & Energy Law & Policy Journal, University of Houston Law Center, Houston, 23 February 2007.

Lessons learned about bird collisions with wind turbines in the Altamont Pass and other US wind farms. Meeting with Japan Ministry of the Environment and Japan Ministry of the Economy, Wild Bird Society of Japan, and other NGOs Tokyo, Japan, 9 November 2006.

Lessons learned about bird collisions with wind turbines in the Altamont Pass and other US wind farms. Symposium on bird collisions with wind turbines. Wild Bird Society of Japan, Tokyo, Japan, 4 November 2006.

Responses of Fresno kangaroo rats to habitat improvements in an adaptive management framework. California Society for Ecological Restoration (SERCAL) 13th Annual Conference, UC Santa Barbara, 27 October 2006.

Fatality associations as the basis for predictive models of fatalities in the Altamont Pass Wind Resource Area. EEI/APLIC/PIER Workshop, 2006 Biologist Task Force and Avian Interaction with Electric Facilities Meeting, Pleasanton, California, 28 April 2006.

Burrowing owl burrows and wind turbine collisions in the Altamont Pass Wind Resource Area. The Wildlife Society - Western Section Annual Meeting, Sacramento, California, February 8, 2006.

Mitigation at wind farms. Workshop: Understanding and resolving bird and bat impacts. American Wind Energy Association and Audubon Society. Los Angeles, CA. January 10 and 11, 2006.

Incorporating data from the California Wildlife Habitat Relationships (CWHR) system into an impact assessment tool for birds near wind farms. Shawn Smallwood, Kevin Hunting, Marcus Yee, Linda Spiegel, Monica Parisi. Workshop: Understanding and resolving bird and bat impacts. American Wind Energy Association and Audubon Society. Los Angeles, CA. January 10 and 11, 2006.

Toward indicating threats to birds by California's new wind farms. California Energy Commission, Sacramento, May 26, 2005.

Avian collisions in the Altamont Pass. California Energy Commission, Sacramento, May 26, 2005.

Ecological solutions for avian collisions with wind turbines in the Altamont Pass Wind Resource Area. EPRI Environmental Sector Council, Monterey, California, February 17, 2005.

Ecological solutions for avian collisions with wind turbines in the Altamont Pass Wind Resource Area. The Wildlife Society—Western Section Annual Meeting, Sacramento, California, January 19, 2005.

Associations between avian fatalities and attributes of electric distribution poles in California. The Wildlife Society - Western Section Annual Meeting, Sacramento, California, January 19, 2005.

Minimizing avian mortality in the Altamont Pass Wind Resources Area. UC Davis Wind Energy Collaborative Forum, Palm Springs, California, December 14, 2004.

Selecting electric distribution poles for priority retrofitting to reduce raptor mortality. Raptor Research Foundation Meeting, Bakersfield, California, November 10, 2004.

Responses of Fresno kangaroo rats to habitat improvements in an adaptive management framework. Annual Meeting of the Society for Ecological Restoration, South Lake Tahoe, California, October 16, 2004.

Lessons learned from five years of avian mortality research at the Altamont Pass Wind Resources Area in California. The Wildlife Society Annual Meeting, Calgary, Canada, September 2004.

The ecology and impacts of power generation at Altamont Pass. Sacramento Petroleum Association, Sacramento, California, August 18, 2004.

Burrowing owl mortality in the Altamont Pass Wind Resource Area. California Burrowing Owl Consortium meeting, Hayward, California, February 7, 2004.

Burrowing owl mortality in the Altamont Pass Wind Resource Area. California Burrowing Owl Symposium, Sacramento, November 2, 2003.

Raptor Mortality at the Altamont Pass Wind Resource Area. National Wind Coordinating Committee, Washington, D.C., November 17, 2003.

Raptor Behavior at the Altamont Pass Wind Resource Area. Annual Meeting of the Raptor Research Foundation, Anchorage, Alaska, September, 2003.

Raptor Mortality at the Altamont Pass Wind Resource Area. Annual Meeting of the Raptor Research Foundation, Anchorage, Alaska, September, 2003.

California mountain lions. Ecological & Environmental Issues Seminar, Department of Biology, California State University, Sacramento, November, 2000.

Intra- and inter-turbine string comparison of fatalities to animal burrow densities at Altamont Pass. National Wind Coordinating Committee, Carmel, California, May, 2000.

Using a Geographic Positioning System (GPS) to map wildlife and habitat. Annual Meeting of the Western Section of The Wildlife Society, Riverside, CA, January, 2000.

Suggested standards for science applied to conservation issues. Annual Meeting of the Western Section of The Wildlife Society, Riverside, CA, January, 2000.

The indicators framework applied to ecological restoration in Yolo County, California. Society for Ecological Restoration, September 25, 1999.

Ecological restoration in the context of animal social units and their habitat areas. Society for Ecological Restoration, September 24, 1999.

Relating Indicators of Ecological Health and Integrity to Assess Risks to Sustainable Agriculture and Native Biota. International Conference on Ecosystem Health, August 16, 1999.

A crosswalk from the Endangered Species Act to the HCP Handbook and real HCPs. Southern California Edison, Co. and California Energy Commission, March 4-5, 1999.

Mountain lion track counts in California: Implications for Management. Ecological & Environmental Issues Seminar, Department of Biological Sciences, California State University, Sacramento, November 4, 1998.

"No Surprises" -- Lack of science in the HCP process. California Native Plant Society Annual Conservation Conference, The Presidio, San Francisco, September 7, 1997.

In Your Interest. A half hour weekly show aired on Channel 10 Television, Sacramento. In this episode, I served on a panel of experts discussing problems with the implementation of the Endangered Species Act. Aired August 31, 1997.

Spatial scaling of pocket gopher (*Geomyidae*) density. Southwestern Association of Naturalists 44th Meeting, Fayetteville, Arkansas, April 10, 1997.

Estimating prairie dog and pocket gopher burrow volume. Southwestern Association of Naturalists 44th Meeting, Fayetteville, Arkansas, April 10, 1997.

Ten years of mountain lion track survey. Fifth Mountain Lion Workshop, San Diego, February 27, 1996.

Study and interpretive design effects on mountain lion density estimates. Fifth Mountain Lion Workshop, San Diego, February 27, 1996.

Small animal control. Session moderator and speaker at the California Farm Conference, Sacramento, California, Feb. 28, 1995.

Small animal control. Ecological Farming Conference, Asylomar, California, Jan. 28, 1995.

Habitat associations of the Swainson's Hawk in the Sacramento Valley's agricultural landscape. 1994 Raptor Research Foundation Meeting, Flagstaff, Arizona.

Alfalfa as wildlife habitat. Seed Industry Conference, Woodland, California, May 4, 1994.

Habitats and vertebrate pests: impacts and management. Managing Farmland to Bring Back Game Birds and Wildlife to the Central Valley. Yolo County Resource Conservation District, U.C. Davis, February 19, 1994.

Management of gophers and alfalfa as wildlife habitat. Orland Alfalfa Production Meeting and Sacramento Valley Alfalfa Production Meeting, February 1 and 2, 1994.

Patterns of wildlife movement in a farming landscape. Wildlife and Fisheries Biology Seminar Series: Recent Advances in Wildlife, Fish, and Conservation Biology, U.C. Davis, Dec. 6, 1993.

Alfalfa as wildlife habitat. California Alfalfa Symposium, Fresno, California, Dec. 9, 1993.

Management of pocket gophers in Sacramento Valley alfalfa. California Alfalfa Symposium, Fresno, California, Dec. 8, 1993.

Association analysis of raptors in a farming landscape. Plenary speaker at Raptor Research Foundation Meeting, Charlotte, North Carolina, Nov. 6, 1993.

Landscape strategies for biological control and IPM. Plenary speaker, International Conference on Integrated Resource Management and Sustainable Agriculture, Beijing, China, Sept. 11, 1993.

Landscape Ecology Study of Pocket Gophers in Alfalfa. Alfalfa Field Day, U.C. Davis, July 1993.

Patterns of wildlife movement in a farming landscape. Spatial Data Analysis Colloquium, U.C. Davis, August 6, 1993.

Sound stewardship of wildlife. Veterinary Medicine Seminar: Ethics of Animal Use, U.C. Davis. May 1993.

Landscape ecology study of pocket gophers in alfalfa. Five County Grower's Meeting, Tracy, California. February 1993.

Turbulence and the community organizers: The role of invading species in ordering a turbulent system, and the factors for invasion success. Ecology Graduate Student Association Colloquium, U.C. Davis. May 1990.

Evaluation of exotic vertebrate pests. Fourteenth Vertebrate Pest Conference, Sacramento, California. March 1990.

Analytical methods for predicting success of mammal introductions to North America. The Western Section of the Wildlife Society, Hilo, Hawaii. February 1988.

A state-wide mountain lion track survey. Sacramento County Dept Parks and Recreation. April 1986.

The mountain lion in California. Davis Chapter of the Audubon Society. October 1985.

Ecology Graduate Student Seminars, U.C. Davis, 1985-1990: Social behavior of the mountain lion;

Mountain lion control; Political status of the mountain lion in California.

Other forms of Participation at Professional Meetings

- Scientific Committee, Conference on Wind energy and Wildlife impacts, Berlin, Germany, March 2015.

- Scientific Committee, Conference on Wind energy and Wildlife impacts, Stockholm, Sweden, February 2013.

- Workshop co-presenter at Birds & Wind Energy Specialist Group (BAWESG) Information sharing week, Bird specialist studies for proposed wind energy facilities in South Africa, Endangered Wildlife Trust, Darling, South Africa, 3-7 October 2011.

- Scientific Committee, Conference on Wind energy and Wildlife impacts, Trondheim, Norway, 2-5 May 2011.

- Chair of Animal Damage Management Session, The Wildlife Society, Annual Meeting, Reno, Nevada, September 26, 2001.

- Chair of Technical Session: Human communities and ecosystem health: Comparing perspectives and making connection. Managing for Ecosystem Health, International Congress on Ecosystem Health, Sacramento, CA August 15-20, 1999.

- Student Awards Committee, Annual Meeting of the Western Section of The Wildlife Society, Riverside, CA, January, 2000.

- Student Mentor, Annual Meeting of the Western Section of The Wildlife Society, Riverside, CA, January, 2000.

Printed Mass Media

Smallwood, K.S., D. Mooney, and M. McGuinness. 2003. We must stop the UCD biolab now. Op-Ed to the Davis Enterprise.

Smallwood, K.S. 2002. Spring Lake threatens Davis. Op-Ed to the Davis Enterprise.

Smallwood, K.S. Summer, 2001. Mitigation of habitation. The Flatlander, Davis, California.

Entrikan, R.K. and K.S. Smallwood. 2000. Measure O: Flawed law would lock in new taxes. Op-Ed to the Davis Enterprise.

Smallwood, K.S. 2000. Davis delegation lobbies Congress for Wildlife conservation. Op-Ed to the Davis Enterprise.

Smallwood, K.S. 1998. Davis Visions. The Flatlander, Davis, California.

Smallwood, K.S. 1997. Last grab for Yolo's land and water. The Flatlander, Davis, California.

Smallwood, K.S. 1997. The Yolo County HCP. Op-Ed to the Davis Enterprise.

Radio/Television

PBS News Hour,

FOX News, Energy in America: Dead Birds Unintended Consequence of Wind Power Development, August 2011.

KXJZ Capital Public Radio -- Insight (Host Jeffrey Callison). Mountain lion attacks (with guest Professor Richard Coss). 23 April 2009;

KXJZ Capital Public Radio -- Insight (Host Jeffrey Callison). Wind farm Rio Vista Renewable Power. 4 September 2008;

KQED QUEST Episode #111. Bird collisions with wind turbines. 2007;

KDVS Speaking in Tongues (host Ron Glick), Yolo County HCP: 1 hour. December 27, 2001;

KDVS Speaking in Tongues (host Ron Glick), Yolo County HCP: 1 hour. May 3, 2001;

KDVS Speaking in Tongues (host Ron Glick), Yolo County HCP: 1 hour. February 8, 2001;

KDVS Speaking in Tongues (host Ron Glick & Shawn Smallwood), California Energy Crisis: 1 hour. Jan. 25, 2001;

KDVS Speaking in Tongues (host Ron Glick), Headwaters Forest HCP: 1 hour. 1998;

Davis Cable Channel (host Gerald Heffernon), Burrowing owls in Davis: half hour. June, 2000;

Davis Cable Channel (hosted by Davis League of Women Voters), Measure O debate: 1 hour. October, 2000;

KXTV 10, In Your Interest, The Endangered Species Act: half hour. 1997.

Reviews of Journal Papers (Scientific journals for whom I've provided peer review)

Journal	**Journal**
American Naturalist	Journal of Animal Ecology
Journal of Wildlife Management	Western North American Naturalist
Auk	Journal of Raptor Research
Biological Conservation	National Renewable Energy Lab reports
Canadian Journal of Zoology	Oikos
Ecosystem Health	The Prairie Naturalist
Environmental Conservation	Restoration Ecology
Environmental Management	Southwestern Naturalist
Functional Ecology	The Wildlife Society--Western Section Trans.
Journal of Zoology (London)	Proc. Int. Congress on Managing for Ecosystem Health
Journal of Applied Ecology	Transactions in GIS
Ecology	Tropical Ecology
Biological Control	The Condor

Committees

- Scientific Review Committee, Alameda County, Altamont Pass Wind Resource Area
- Ph.D. Thesis Committee, Steve Anderson, University of California, Davis
- MS Thesis Committee, Marcus Yee, California State University, Sacramento

Other Professional Activities or Products

Testified in Federal Court in Denver during 2005 over the fate of radio-nuclides in the soil at Rocky Flats Plant after exposure to burrowing animals. My clients won a judgment of $553,000,000. I have also testified in many other cases of litigation under CEQA, NEPA, the Warren-Alquist Act, and other environmental laws. My clients won most of the cases for which I testified.

Testified before Environmental Review Tribunals in Ontario, Canada regarding proposed White Pines and Amherst Island Wind Energy projects.

Testified in Skamania County Hearing in 2009 on the potential impacts of zoning the County for development of wind farms and hazardous waste facilities.

Testified in deposition in 2007 in the case of O'Dell et al. vs. FPL Energy in Houston, Texas.

Testified in Klickitat County Hearing in 2006 on the potential impacts of the Windy Point Wind Farm.

Memberships in Professional Societies

The Wildlife Society
Raptor Research Foundation

Honors and Awards

Fulbright Research Fellowship to Indonesia, 1987
J.G. Boswell Full Academic Scholarship, 1981 college of choice
Certificate of Appreciation, The Wildlife Society—Western Section, 2000, 2001
Northern California Athletic Association Most Valuable Cross Country Runner, 1984
American Legion Award, Corcoran High School, 1981, and John Muir Junior High, 1977
CIF Section Champion, Cross Country in 1978
CIF Section Champion, Track & Field 2 mile run in 1981
National Junior Record, 20 kilometer run, 1982
National Age Group Record, 1500 meter run, 1978

Community Activities

District 64 Little League Umpire, 2003-2007
Dixon Little League Umpire, 2006-07
Davis Little League Chief Umpire and Board member, 2004-2005
Davis Little League Safety Officer, 2004-2005
Davis Little League Certified Umpire, 2002-2004
Davis Little League Scorekeeper, 2002
Davis Visioning Group member
Petitioner for Writ of Mandate under the California Environmental Quality Act against City of Woodland decision to approve the Spring Lake Specific Plan, 2002
Served on campaign committees for City Council candidates