

Maryanne Cronin

From: Jewelle Kennedy <jkennedy@ensemble.net>
Sent: Monday, October 14, 2019 4:24 PM
To: Maryanne Cronin
Cc: Tyson Sayles; Derek Burnham; Amy Harbin; Jonathan Iniesta; Alexis Oropeza; Christopher Koontz
Subject: 3rd and Pacific Response Letter
Attachments: 1115-7_Bird Strike Memo with Attachments.pdf; Ramboll response IAQ Lozeau 191002.pdf; 3rd and Pacific - Response to Public Comments 10-14-19.docx

Hi Maryanne,

As discussed, please find attached response letter to the public comments and memos from biological and air quality experts to incorporate in the staff report for the 11/12 City Council hearing.

Thank you,

Jewelle



Jewelle Kennedy
Development Associate
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Responses to Public Comments Presented to the Planning Commission and in the Appeal

The following are brief responses to the appeal of the Planning Commission's approval of the proposed 3rd and Pacific project ("Project") filed by SAFER ("Appellant"), as well as responses to the main comments by the public to the Planning Commission.

1. Tiered EIR vs. Addendum.

The Appellant maintains that the City was required to prepare a tiered EIR for the Project. As set forth below, the City's determination not to prepare an EIR is correct and supported by substantial evidence.

In January 2012, the City certified the Downtown Plan Program Environmental Impact Report (PEIR) and adopted the Downtown Plan. The PEIR analyzed the potential environmental impacts that may result from the implementation of the Downtown Plan, which covers an area of approximately 719 acres, including the Project site. The PEIR assumed that full implementation of the Downtown Plan could increase the density and intensity of existing Downtown land uses by adding up to (1) approximately 5,000 new residential units; (2) 1.5 million square feet (sf) of new office, civic, cultural, and similar uses; (3) 384,000 sf of new retail; (4) 96,000 sf of restaurants; and (5) 800 new hotel rooms.

CEQA establishes the type of environmental documentation required when changes to a project occur after an EIR is certified. Specifically, CEQA Guidelines Section 15164(a) states that:

The lead agency or responsible agency shall prepare an addendum to a previously certified EIR if some changes or additions are necessary but none of the conditions described in Section 15162 calling for preparation of a subsequent EIR have occurred.

CEQA Guidelines Section 15162 requires a subsequent EIR when an EIR has been certified or mitigated negative declaration adopted and one or more of the following circumstances exist:

1. Substantial changes are proposed in the project which will require major revisions of the previous EIR or negative declaration due to the involvement of new significant environmental effects or a substantial increase in the severity of previously identified significant effects;
2. Substantial changes occur with respect to the circumstances under which the project is undertaken, which will require major revisions of the previous EIR or negative declaration due to the involvement of new significant environmental effects or a substantial increase in the severity of previously identified significant effects; or
3. New information of substantial importance, which was not known and could not have been known with the exercise of reasonable diligence at the time the previous EIR was certified as complete or the negative declaration was adopted, shows any of the following:
 - a. The project will have one or more significant effects not discussed in the previous EIR or negative declaration;
 - b. Significant effects previously examined will be substantially more severe than shown in the previous EIR;

c. Mitigation measures or alternatives previously found not to be feasible would in fact be feasible, and would substantially reduce one or more significant effects of the project, but the project proponents decline to adopt the mitigation measure or alternative; or

d. Mitigation measures or alternatives which are considerably different from those analyzed in the previous EIR would substantially reduce one or more significant effects on the environment, but the project proponents decline to adopt the mitigation measure or alternative.

As set forth in Response 2 below, consistent with CEQA, the City prepared an Addendum to determine whether the Project would result in any new or increased significant impacts beyond those disclosed in the PEIR. The Addendum and its supporting expert technical reports provide substantial evidence showing that the Project would not result in any such new or increased significant impacts or would otherwise require preparation of a subsequent or supplemental EIR.

CEQA Guidelines Section 15168(a) provides:

A program EIR is an EIR which may be prepared on a series of actions that can be characterized as one large project and are related either:

- (1) Geographically,
- (2) A logical parts [sic] in the chain of contemplated actions,
- (3) In connection with issuance of rules, regulations, plans, or other general criteria to govern the conduct of a continuing program, or
- (4) As individual activities carried out under the same authorizing statutory or regulatory authority and having generally similar environmental effects which can be mitigated in similar ways.

The PEIR meets each of the forgoing criteria. First, the Downtown Plan covers the development of a number of contiguous properties within a specific geographic area, Downtown. Further, the development of individual projects pursuant to the Downtown Plan are logical parts of that plan, which is intended to regulate development in Downtown. Moreover, the PEIR was prepared in connection with the adoption of the Downtown Plan, which is a plan that includes rules, regulations, and other criteria to govern Downtown development. Finally, the type of urban infill development projects permitted under the Downtown Plan would have generally similar environmental effects that can be mitigated in similar ways.

One of the benefits of program EIRs is to avoid having to prepare EIRs for subsequent related activities. CEQA Guidelines Section 15168(c) provides:

Use with Later Activities. Subsequent activities in the program must be examined in the light of the program EIR to determine whether an additional environmental document must be prepared.

- (1) If a later activity would have effects that were not examined in the program EIR, a new Initial Study would need to be prepared leading to either an EIR or a negative declaration.

(2) If the agency finds that pursuant to Section 15162, no new effects could occur or no new mitigation measures would be required, the agency can approve the activity as being within the scope of the project covered by the program EIR, and no new environmental document would be required.

(3) An agency shall incorporate feasible mitigation measures and alternatives developed in the program EIR into subsequent actions in the program.

(4) Where the subsequent activities involve site specific operations, the agency should use a written checklist or similar device to document the evaluation of the site and the activity to determine whether the environmental effects of the operation were covered in the program EIR.

As set forth in Response 2 below, the Project was addressed in the PEIR. The Addendum assessed potential impacts of the Project and determined that it would not have effects that were not analyzed in the PEIR. Further, the Mitigation Monitoring and Reporting Program for the Project includes all applicable mitigation measures from the PEIR. Therefore, contrary to the comment, a tiered EIR is not required for the Project.

Pursuant to Section 1.3 of the PEIR, the PEIR serves “as a basis for streamlined environmental review of all subsequent public and private actions that may be subject to CEQA review for land development projects, infrastructure improvements, and other ordinances, programs, and actions that the Lead Agency determines to be necessary to implement the Downtown Plan.” Furthermore, the PEIR states:

Because the Project is an adoption of a plan, not an individual or series of development projects, subsequent environmental review will be subject to the provisions of Section 15183 of the State CEQA Guidelines, under which projects that are consistent with the development density or intensity of the plan “shall not be subject to additional environmental review, except as might be necessary to examine whether there are project-specific significant effects which are peculiar to the project or its site.” Section 15183 provides additional guidance for preparation of an Initial Study for subsequent projects to determine whether there are project- or site-specific impacts; environmental effects that were not analyzed as significant effects in the PEIR; as offsite or cumulative impacts; or as more severe impacts than were identified in the PEIR.

The mitigation measures to the PEIR require, where appropriate, preparation of specific additional studies and analyses to determine whether an individual project would result in project-specific new or increased significant effects that are peculiar to the project or its site. The Addendum includes all of the required studies and provides substantial evidence that the Project would not result in Project-specific new or increased significant effects that are peculiar to the Project or its site. Therefore, the Project is also exempt from further CEQA review under CEQA Guidelines Section 15183.

2. Project Addressed in PEIR.

The Appellant’s claim that the Project was not addressed in the PEIR is incorrect. The PEIR analyzed the adoption and implementation of the Downtown Plan that would replace, and in fact did replace, the existing land use, zoning, and planned development districts as the land use and design document for all future development in the Downtown Plan area. The PEIR assessed the maximum development under the Downtown Plan, consisting of (1) approximately 5,000 new residential units, (2) 1.5 million sf of new

office, civic, cultural, and similar uses, (3) 384,000 sf of new retail, (4) 96,000 sf of restaurants, and (5) 800 new hotel rooms.

The Project would be developed on a site located within boundaries of the Downtown Plan area, which is the Project site identified in the PEIR. Specifically, it is located in the Plan's Business and Entertainment District. The Project would replace two existing surface parking lots on a 1.2-acre site with an 8-story building and a 23-story high rise building. A pedestrian-focused paseo would be constructed between the two proposed buildings. The Project would include a total of 345 residential units and 14,481 sf of ground floor retail commercial space. Thus, the Project is well within the development envelope analyzed in the PEIR.

Moreover, the Project is consistent with all of the applicable standards of the Downtown Plan, including the following:

Use. The Project's residential and retail uses are permitted in Business and Entertainment District (Downtown Plan Table 3-1).

Density. Density is regulated through height and floor area ratio (FAR). (See below.)

Height. The Project is located in the Height Incentive Area (Downtown Plan Figure 3-2), which provides a base height of 240 feet and a height of up to 500 feet by providing development incentives (Downtown Plan Table 3-3). As the Project would provide green roofs, achieve LEED Silver certification or equivalent, and have 10 percent of the site dedicated as public open space, it is entitled to the increased height bonus (Downtown Plan Table 3-4). Therefore, the Project's maximum height of 269 feet is consistent with the Downtown Plan and well below the maximum permitted.

FAR. The base FAR in the Height Incentive Area is 8.0 to 1, with a maximum FAR of 11.0 to 1 permitted with incentives (Downtown Plan Table 3-3). By providing the above incentives, the Project is entitled to an additional FAR of 1.5 to 1, for a total of 9.5 to 1. With an FAR of 9.48 to 1, the Project is consistent with the Downtown Plan standards.

Parking. The Project would be required to provide 447 parking spaces at the ratios set forth in Downtown Plan Tables 3-5 and 3-6. The Project would exceed this requirement by providing 563 spaces.

Open Space. The Downtown Plan requires the Project to provide 10,454 square feet of common outdoor open space, 500 square feet of common indoor open space, and 6,288 square feet of private open space (Downtown Plan Table 3-10). The Project would exceed these requirements by providing 13,944 square feet of common outdoor open space, 11,688 square feet of common indoor open space, and 11,340 square feet of private open space.

Thus, contrary to the comment, the Project was in fact addressed in the PEIR.

3. Indoor Air Quality

The Appellant maintains that the Project would have a significant impact on indoor air quality due to formaldehyde. However, the Appellant provides no credible evidence that the Project will be constructed with building materials with significant amounts of formaldehyde, citing only an unsubstantiated, general article. As set forth in the attached memorandum from air quality expert Eric Lu of Ramboll, “the unsubstantiated comments regarding the indoor air quality risk levels have no merit, as there is no analysis to assess any risk level as stated in the comment.” Moreover, “the existing rules and regulations are robust and adequate to ensure that issues related to formaldehyde from building materials will not be an issue for indoor air quality at the project.”

4. Biological Resources

The Appellant claims that the Project may have a significant impact on biological resources as a result of avian window collisions, but again fails to provide credible evidence to support its claim. As set forth in the attached memorandum from biological expert Tony Bomkamp of Glenn Lukos Associates, according to the United States Fish & Wildlife Service less than one percent of bird strikes occur with high rises such as the Project. Moreover, the Project would implement Condition 3, which incorporates the most up-to-date “Best Practices” that will significantly reduce the Project’s potential for avian window collisions. Thus, the memorandum concludes that “there is no potential for significant impacts on avian species due to window collisions associated with the project.”

5. Significant and Unavoidable Impacts in the PEIR

The Appellant asserts that the City must prepare an EIR because the PEIR finds significant and unavoidable impacts. However, the portion of the case cited by the Appellant relates to a challenge to a CEQA Guideline Section that has since been rescinded. Therefore, that case has no relevance to the Project. The question is not whether the PEIR discloses significant and unavoidable impacts, but whether the Project will result in any new or materially increased significant impacts not assessed in the PEIR. The Addendum and its supporting expert technical reports provides substantial evidence that the Project will not result in such new or increased impacts.

6. Affordable housing

Commenters contend that the Project should not be approved as it does not include any affordable housing. However, there is no applicable law, regulation or policy that requires the Project to include affordable housing. In addition, the Project site has never been identified as an affordable housing site. While increasing affordable housing in the City is an important public policy goal, it is not the only one. The Project will further several other important public policy goals, including increasing the City’s housing stock without displacing any existing homes, adding housing within walking distance to transit, jobs, and retail and entertainment uses to reduce dependence on automobiles, thereby reducing vehicle miles travelled and associated pollutant and greenhouse gas emissions, and promoting sustainability and water and energy conservation by including a green roof and achieving LEED Silver certification or equivalence.

7. Merger of Parcels

Commenters have stated their opinion that the proposed merger of the Project site parcels should not be approved. One of the Project approvals is a Vesting Tentative Tract Map. Recordation of the final map will automatically merge the six existing parcels into a single ground lot and create six airspace lots. It is not possible to segregate out certain parcels. Nor is it desirable, as the consolidation to the parcels is necessary to provide for the public paseo across the existing parcels and to enable the Project to obtain financing.

8. Tower Height

Commenters state their opinions that the 23-story high-rise tower is out of scale. However, at 269 feet, the Project would be consistent with the Downtown Plan's height standards, and in fact would be well below the 500-foot maximum allowed in the Height Incentive Area (PD-30 Plan area). As stated in the Addendum, the Project would be required to comply with the Downtown Plan's Design Guidelines and subject to the City's Design Review process; thus, it would contribute to the overall goal of promoting the development of a distinctive Downtown skyline, while enhancing the visual environment of Downtown.

Public Resources Code Section 21099(d) states: "Aesthetic and parking impacts of a residential, mixed-use residential, or employment center project on an infill site within a transit priority area (TPA) shall not be considered significant impacts on the environment." Public Resources Code Section 21099 defines a "transit priority area" as an area within 0.5 mile of a major transit stop. Public Resources Code Section 21064.3 defines "major transit stop" as "a site containing an existing rail transit station, a ferry terminal served by either a bus or rail transit service, or the intersection of two or more major bus routes with a frequency of service interval of 15 minutes or less during the morning and afternoon peak commute periods." Public Resources Code Section 21099 defines an infill site as a lot located within an urban area that has been previously developed, or on a vacant site where at least 75 percent of the perimeter of the site adjoins, or is separated only by an improved public right-of-way from, parcels that are developed with qualified urban uses.

The Project is a mixed-use residential project located on an infill site in an urbanized area that is within less than ½ mile from the Blue Line. Therefore, the Project's aesthetic impacts, including impacts related to height, scale, and massing, are less than significant under Public Resources Code Section 21099(d).

9. Traffic and parking

Commenters maintain that the Project will result in traffic and parking impacts. As set forth in the Addendum and the supporting Traffic Impact Analysis, the impact of traffic generated by construction and operation of the Project at the 14 study intersections would be less than significant. In addition, the Project's parking would be more than adequate as it would provide 116 parking spaces beyond the Downtown Plan's requirements.

9. Sidewalk closures.

A commenter expressed concern that Project construction would require closures of sidewalks that would inconvenience seniors and the disabled. Project construction may require temporary and intermittent sidewalk closures, no long-term closures are anticipated.

11. Utilities

A commenter maintains that the existing electrical infrastructure is inadequate to service the Project. The Project is located in an urbanized area that is well served by utilities. The PEIR determined that there was adequate utility and service systems infrastructure for the Downtown Plan (i.e. less than significant impacts) for which the Project is a part of, except for solid waste disposal and treatment, which is subject to mitigation measures which the Project will comply with as appropriate. As part of the building permit process, the Project would be required to upgrade any infrastructure as needed to serve the Project.

12. Flooding

A commenter expressed concern regarding flooding due to the pervious nature of the Project's buildings and adjoining sidewalks and roads. As set forth in the Addendum:

The project site is currently developed with two paved surface parking lots. As such, the site is almost entirely impervious to drainage. Adjacent areas are also predominately built-out and there are no nearby or adjacent streams or rivers. However, as stated in the Hydrology and Water Quality Technical Report, the project would improve the project site's hydrologic function. The project design would likely include the implementation of either a capture and use system or planter boxes that would comply with the City's LID requirements. Whereas runoff water from the project site currently sheet flows without treatment into the underground storm drain network that ultimately discharges to the Los Angeles River Reach 1, the proposed capture and use system would capture the water runoff for irrigation. The Hydrology and Water Quality Technical Report concluded that the surface water hydrology, water quality and groundwater impacts would be less than significant.

In addition, the Project would implement Mitigation Measure Hydro-3, which provides:

Prior to issuance of a building permit, the City Stormwater Management Division shall determine the need for the developer to conduct an analysis of the existing stormwater drainage system and to identify improvements needed to accommodate any projected increased runoff that would result from the proposed Project. The evaluation conducted by the developer shall include a determination of whether Low Impact Development (LID) practices and strategies should be incorporated into the project to reduce post-development peak stormwater runoff discharge rates to not exceed the estimated pre-development discharge rates.

Therefore, the Project would not cause or contribute to flooding.

Via Electronic Mail

Ms. Jewelle Kennedy
 Development Associate
 Ensemble Real Estate Investments
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 Long Beach, CA
jkennedy@ensemble.net

**RE: REVIEW OF THE COMMENT ON INDOOR AIR QUALITY SUBMITTED BY
 LOZEAU DRURY LLP FOR THE W 3RD AND PACIFIC AVENUE PROJECT
 LONG BEACH, CALIFORNIA**

Dear Ms. Kennedy:

October 2, 2019

Per your request, we have reviewed the indoor air quality comment submitted by Lozeau Drury LLP in a letter dated September 19, 2019 (Lozeau Letter). The comment is under section III.A. (begins on page 4) and references Exhibit A of the Lozeau Letter ("the comment").

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The comment makes an unfounded assertions on the Project indoor quality. The comment provides no substantial evidence that the Project may have a significant Impact on indoor air quality, and there is no analysis or information to support the comment's claim "*there is a significant likelihood that the Project's emissions of formaldehyde to air will result in very significant cancer risks to future residents and workers in the buildings*". These comments are speculative and made without any evidence (and thus without substantial evidence). The comment only attaches a published paper by Chan¹, and the primary conclusion by Chan is: "...contaminant levels are lower than measured from about 10 years ago." Thus, the unsubstantiated comments regarding the indoor air quality risk levels have no merit, as there is no analysis to assess any risk level as stated in the comment. The comment refers to expert comments from "other projects", however, it provides no reference to those projects, and thus there is no evidence on what these comments were, nor where they can be found.

We are not aware of credible or peer-reviewed studies which assessed long-term indoor concentrations and associated lifetime exposure to formaldehyde in new homes and commercial spaces in California that suggest the existing rules and regulations on formaldehyde in building materials is a concern. As further highlighted below, the existing rules and regulations are robust and adequate to ensure that issues related to formaldehyde from building materials will not be an issue for indoor air quality at the Project. Thus, in the context of the Addendum for the Project, the City is not required to further analyze indoor air quality at the Project as there is no information to suggest that there would be a potentially significant impact. And contrary to the comment (see Comment page 5), the City has not failed to investigate potential impacts from formaldehyde exposure.

¹ Exhibit A of the September 19, 2019 Lozeau and Drury LLP comment letter. Article by Chan et al.

Existing regulations and guidance establish the necessary actions to address indoor air quality issues from building material usage. There are no requirements or guidance from SCAQMD or relevant agencies to evaluate such risk and the project does not represent a unique or special development that needs addressing in CEQA, therefore no special analysis or mitigation is required. The project will be compliant with the existing codes and regulations in California, which adequately address potential emissions and risks from building materials to ensure safe practices and healthy indoor air. These codes include:

- a. **Title 24²:** The Building Energy Efficiency Standards (Energy Standards) already address the “energy and water efficiency requirements (and indoor air quality requirements) for newly constructed buildings, and alterations to existing buildings”. The Standards are applicable to Mechanical Systems whose one of the primary functions is “indoor air quality for occupant comfort and health”. These Standards addresses ventilation, indoor air quality, and air filtration requirements (including the use of high efficiency filters), the checks and balances and need to be performed, and the acceptance test requirements. One of the General Envelope Requirements is that manufacturers must certify that insulating materials comply with the California Quality Standards for Insulating Materials to assure that “insulation sold or installed in the state performs according to the stated R-value and meets minimum quality, health, and safety standards.”
- b. **CALGreen³:** The California Green Building Standards Code (CALGreen Code), applicable to new commercial and industrial buildings, is designed to promote “*environmentally responsible, cost-effective, healthier places to live and work*”. “*CALGreen includes both required measures and voluntary measures, a number of which help assure healthful indoor air quality, such as those addressing chemical emissions from composite wood products, carpets, resilient flooring materials, paints, adhesives, sealants, and insulation, and also ventilation.*”


More specifically, Section 4.5, Environmental Quality, of the CALGreen Code provides mandatory residential measures to reduce the quantity of air contaminants that are odorous, irritating and/or harmful to the comfort and wellbeing of a building’s installers, occupants and neighbors. It includes VOC limits for paints, coatings, adhesives, adhesive bonding primers, sealants, sealant primers, and caulk. Section 4.504.3, Carpet Systems, of the CALGreen Code establishes product requirements to meet one of the following: (1) Carpet and Rug Institute’s Green Label Plus Program; (2) California Department of Public Health, “Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers,” Version 1.1; (3) NSF/ANSI 140 at the Gold Level; or (4) Scientific Certifications Systems Indoor Advantage Gold. Furthermore, Section 4.504.5, Composite Wood Products, of the CALGreen Code establishes limits for formaldehyde as specified in ARBS’s Air Toxics Control Measure for Composite Wood (e.g., particle board). These measures have been established through the CALGreen Code and are designed to reduce the quantity of air contaminants to acceptable levels.

² 2019 Building Energy Efficiency Standards: Available at: <https://www.energy.ca.gov/programs-and-topics/programs/building-energy-efficiency-standards/2019-building-energy-efficiency>. Accessed: October, 2019.

³ California Green Building Standard Code: Available at: <https://ww3.arb.ca.gov/research/indoor/greenbuildings.htm>. Accessed: October, 2019.

- c. **CARB ATCM (Airborne Toxic Control Measure to Reduce Formaldehyde Emissions from Composite Wood Products)⁴:** The purpose of this airborne toxic control measure is to “reduce formaldehyde emissions from composite wood products, and finished goods that contain composite wood products, that are sold, offered for sale, supplied, used, or manufactured for sale in California. The composite wood products covered by this regulation are hardwood plywood, particleboard, and medium density fiberboard.” The measure applies to manufacturers, distributors, importers, fabricators (that use such materials to make other goods), retailers, third party certifiers who manufacture, offer for sale or supply these goods in California. The control measure assures that all building materials and furnishings manufactured, distributed, imported and used in new construction in California meet the maximum allowable concentrations that assure healthful indoor air quality.

Sincerely,



Eric C. Lu, MS, PE
Principal

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cc: Sarah Manzano, Ramboll
Biljana Cosic, Ramboll

⁴ CARB Airborne Toxic Control Measure: Available at: https://ww3.arb.ca.gov/regact/2007/compwood07/fro-final.pdf?_ga=2.6233904.2078388042.1564574457-610727980.1563828547. Accessed: October, 2019.

MEMORANDUM

GLENN LUKOS ASSOCIATES

Regulatory Services



PROJECT NUMBER: 11150007LONG
TO: Jewelle Kennedy
FROM: Tony Bomkamp
DATE: October 2, 2019
SUBJECT: Potential Bird Strike Impacts and Associated Conditions of Approval to Minimize Potential Bird Strike Impacts, 131 West 3rd Street Application No. 1807-11 (SPR18-038, TTM18-008, GPC18-004), Long Beach, California

In a September 19, 2019 letter to the Long Beach Planning Commission referencing the above-mentioned project, Lozeau Drury LLP makes the following assertion regarding potential impacts to avifauna due to collisions with windows:

The Project as planned would contribute to an ongoing national catastrophe in bird collision deaths caused by poorly planned incorporation of windows into building designs. Constructing 8- and 23-story buildings, as the Project proposes to do, will not only take aerial habitat from birds, but it will also interfere with the movement of birds in the region and it will result in large numbers of annual window collision fatalities.

The letter continues with detailed support for the assertion:

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)¹ and Dunn's (1993)² estimates of about 100 million to 1 billion bird fatalities in the USA, or more recently Loss et al.'s (2014)³ estimate of 365-988 million bird fatalities in the USA

¹ Klem, D., Jr. 1990. Collisions between birds and windows: mortality and prevention. *Journal of Field Ornithology* 61:120-128.

² Dunn, E. H. 1993. Bird mortality from striking residential windows in winter. *Journal of Field Ornithology* 64:302-309.

³ Loss, S. R., T. Will, S. S. Loss, and P. P. Marra. 2014. Bird–building collisions in the United States: Estimates of annual mortality and species vulnerability. *The Condor: Ornithological Applications* 116:8-23. DOI: 10.1650/CONDOR-13-090.1

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or Calvert et al.'s (2013)⁴ and Machtans et al.'s (2013)⁵ estimates of 22.4 million and 25 million bird fatalities in Canada, respectively.

Gelb and Delacretaz (2009)⁶ 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)⁷ monitored 73 building façades in New York City during 114 days of two migratory periods, tallying 549 collision victims, nearly 5 birds per day. Borden et al. (2010)⁸ 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)⁹ found 35 bird fatalities of 16 species within only 45 days of monitoring under 4 building façades. In San Francisco, Kahle et al. (2016)¹⁰ found 355 collision victims within 1,762 days under a 5-story building. Ocampo-Peñuela et al. (2016)¹¹ 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.

The commenter is correct that there is substantial evidence that avian collisions with glass that has not been designed or treated to reduce or eliminate avian collisions is a cause of avian mortality. Nevertheless, citing some of the same reports, the U.S. Fish and Wildlife Service (USFWS) provides additional clarification regarding the effects of tall buildings versus other buildings:

Annual bird mortality resulting from window collisions in the U.S. is estimated to be between 365-988 million birds (Loss et al. 2014). While most people consider bird/glass collisions an urban phenomenon involving tall, mirrored-

⁴ Calvert, A. M., C. A. Bishop, R. D. Elliot, E. A. Krebs, T. M. Kydd, C. S. Machtans, and G. J. Robertson. 2013. A synthesis of human-related avian mortality in Canada. *Avian Conservation and Ecology* 8(2): 11.

<http://dx.doi.org/10.5751/ACE-00581-080211>

⁵ Machtans, C. S., C. H. R. Wedeles, and E. M. Bayne. 2013. A first estimate for Canada of the number of birds killed by colliding with building windows. *Avian Conservation and Ecology* 8(2):6. <http://dx.doi.org/10.5751/ACE-00568-080206>

⁶ Gelb, Y. and N. Delacretaz. 2009. Windows and vegetation: Primary factors in Manhattan bird collisions. *Northeastern Naturalist* 16:455-470.

⁷ Klem, D., Jr. 2009. Preventing bird-window collisions. *The Wilson Journal of Ornithology* 121:314-321.

⁸ Borden, W. C., O. M. Lockhart, A. W. Jones, and M. S. Lyons. 2010. Seasonal, taxonomic, and local habitat components of bird-window collisions on an urban university campus in Cleveland, OH. *Ohio Journal of Science* 110(3):44-52.

⁹ Parkins, K. L., S. B. Elbin, and E. Barnes. 2015. Light, Glass, and Bird–building Collisions in an Urban Park. *Northeastern Naturalist* 22:84-94.

¹⁰ Kahle, L. Q., M. E. Flannery, and J. P. Dumbacher. 2016. Bird-window collisions at a westcoast urban park museum: analyses of bird biology and window attributes from Golden Gate Park, San Francisco. *PLoS ONE* 11(1):e144600 DOI 10.1371/journal.pone.0144600.

¹¹ Ocampo-Peñuela, N., R. S. Winton, C. J. Wu, E. Zambello, T. W. Wittig and N. L. Cagle. 2016. Patterns of bird-window collisions inform mitigation on a university campus. *PeerJ*:e1652;DOI10.7717/peerj.1652

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glass skyscrapers, the reality is that 56% of collision mortality occurs at low-rise (i.e., one to three story) buildings, 44% at urban and rural residences, and <1% at high-rises (Loss et al. 2014).¹²

The USFWS document *Reducing Bird Collisions with Buildings and Building Glass: Best Practices* (“Reducing Collisions”) [Attached], provides a variety of best practices that can greatly reduce the potential for collisions as noted by the commenter: “another building with collision-deterrent glass caused only 2 of the fatalities.” Among the best practices cited by USFWS are the following:

- Patterns on the glass clearly visible to avifauna with suitable spacing
 - Stripped patterns
 - Dotted patterns
- Installation of special film, glass or covering
 - Application of special films (usually a “retrofit” option)
 - Fritted glass
 - Ultraviolet patterned glass
 - Screens and netting
 - Architectural features (e.g., shading to reduce glare)
- Lighting Options (of which there are a variety of suggestions)
- Landscaping options
 - Exterior landscaping approaches
 - Placement of indoor plants

The USFWS’s *Reducing Collisions* document includes a variety of measures for new buildings that include both building design and glass design and patterns. Condition 3 of the project’s conditions of approval incorporates a suite of “Best Practices” for the new buildings that will reduce the already limited (less than one-percent) mortality rate associated with avian window collisions. Specifically, Condition 3 incorporates best practices consistent with the best practices in *Reducing Collisions* and/or other sources that address best practices to reduce avian glass collisions.¹³

¹² U.S. Fish and Wildlife Service, Division of Migratory Bird Management. January 2016. *Reducing Bird Collisions with Buildings and Building Glass: Best Practices*.

¹³ See for example:

[LEED Pilot Credit 55: Bird Collision Deterrence](#)

<http://www.birdsafeglassfoundation.org/contact-us/resources/>

<https://www.audubon.org/conservation/existing-lights-out-programs>

MEMORANDUM

October 2, 2019

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3. *The applicant shall provide for "bird-safe" glazing on all buildings as follows:*

a. Fritting, permanent stencils, frosted, nonreflective or angled glass, exterior screens, decorative latticework or grills, physical grids placed on the exterior of glazing, or UV patterns visible to birds shall be used to reduce the amount of untreated glass or glazing to less than thirty-five percent (35%) of the building facade.

b. Where applicable, vertical elements within the treatment pattern should be at least one-quarter inch (1/4") wide at a maximum spacing of four inches (4") and horizontal elements should be at least one-eighth inch (1/8") wide at a maximum spacing of two inches (2").

c. No glazing shall have a "Reflectivity Out" coefficient exceeding thirty percent (30%). That is, the fraction of radiant energy that is reflected from glass or glazed surfaces shall not exceed thirty percent (30%).

d. The building owners and operators shall participate in "Lights Out for Birds" programs or similar initiatives by turning off lighting at night, particularly during bird migration periods.

CONCLUSIONS

Condition 3 incorporates the most up-to-date "Best Practices" which, when implemented, will significantly reduce the potential for avian window collisions for the proposed buildings. As already noted, based on the USFWS clarification (Loss et al. 2014) that high rises account for less than one-percent of avian collisions, the project would not have a significant impact on birds and Condition 3 reduces any potential impacts well below the level of significance.

Finally, if there were to be a bird strike that resulted in a mortality, which would be uncommon given USFWS's observation that less than one percent occur with high rises and the project includes Condition 3, which further reduces the impact likelihood, such an uncommon isolated mortality would need to occur to a sensitive species to be considered "potentially significant". However, in accordance with the Appendix G threshold (which is incorporated into the Addendum – page 68, IV Biological Resources), an isolated death of a sensitive species would not be sufficient to "have a substantial adverse effect . . . on any species identified as a candidate, sensitive, or special-status species . . ." And there is no evidence of sensitive avian species: Addendum (page 68) "[T]he Downtown Plan (which includes the project site) is located within an urbanized area with no sensitive habitat or animal species present." Thus, there is no potential for significant impacts on avian species due to window collisions associated with the project.



Photo by crocsid / Wikimedia CC:BY

REDUCING BIRD COLLISIONS WITH BUILDINGS AND BUILDING GLASS BEST PRACTICES

US FISH AND WILDLIFE SERVICE
DIVISION OF MIGRATORY BIRD MANAGEMENT
FALLS CHURCH, VIRGINIA

JANUARY 2016

**A Special Thanks to
Our Contributors!**

U.S. Fish & Wildlife Service would like to extend a special note of appreciation to the number of highly knowledgeable experts and authorities on bird interactions with building, glass and lighting infrastructure that contributed to the content and review of this document. This product is a true representation of the power of partnerships and coordination across agencies and institutions. This document will continue to be updated with the best available information, and our partnerships with experts in the field will be critical in making that happen. Thanks to all of you for the important work you do for bird conservation!

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OVERVIEW

The U.S. Fish and Wildlife Service (Service) has responsibility to protect and conserve migratory birds as part of four international treaties (Mexico, Japan, Canada, and Russia) and the Migratory Bird Treaty Act. As part of this mission, the Service is working to address human-caused sources of mortality by developing and providing information on options for reducing hazards to migratory birds. Bird collisions associated with building glass and building lighting are hazards where a variety of potential avoidance and minimization options exist. This document is intended to provide straight-forward options for reducing bird collisions with buildings by offering recommendations for simple, no cost building occupant best practices; low cost avoidance and minimization actions; and strategies for new buildings, building renovations, and building retro-fits.

THE ISSUE

Birds generally do not see clear or reflective glass (Klem and Saenger 2013). Glass reflectivity and transparency create a lethal illusion of clear airspace that birds do not see as a barrier. During the daytime, birds collide with windows because they see reflections of the landscape in the glass (e.g., clouds, sky, vegetation, or the ground); or they see through glass to perceived habitat (including potted plants or vegetation inside buildings) or to the sky on the other side. At night, during spring and fall bird migrations when inclement weather occurs, birds can be attracted to lighted structures resulting in collisions, entrapment, excess energy expenditure, and exhaustion (Manville 2009). This phenomenon has resulted in a number of concentrated avian mortality events. These mass events are less common at city, office or residential buildings, but still a possibility under the right weather and lighting conditions. The majority of collisions with both residential and urban buildings happen during the day, as birds fly around looking for food. Large avian mortalities at night more frequently occur at communication towers, offshore drilling platforms and in other situations where there is a bright light source in a dark area, especially during inclement weather.

Annual bird mortality resulting from window collisions in the U.S. is estimated to be between 365-988 million birds (Loss et al. 2014). While most people consider bird/glass collisions an urban phenomenon involving tall, mirrored-glass skyscrapers, the reality is that 56% of collision mortality occurs at low-rise (i.e., one to three story) buildings, 44% at urban and rural residences, and <1% at high-rises (Loss et al. 2014).

In an effort to reduce bird collisions with building glass, the Service's Division of Migratory Bird Management has compiled the following list of best practices and best available technologies. These best practices are grouped into measures that can be implemented at residences and office buildings, and provides options for both new buildings, and for existing building renovations and retro-fits. Many of these measures not only provide protection to birds, but also provide energy and cost savings to building owners.

THE AVOIDANCE/MINIMIZATION OPTIONS

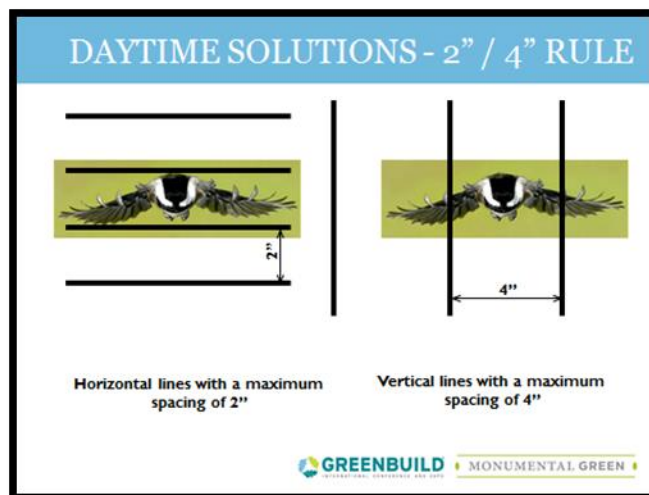
The Service recommends the following options to avoid and minimize bird/glass collisions. Any mention of trade names or commercial products in this document or the documents or websites referenced within does not constitute endorsement or recommendation by the Federal government. Readers should be aware that each product has benefits and limitations. Users of these products should work with technical experts to determine which specific product may work best for a particular application.

GLASS OPTIONS

There are a variety of glass and window design options that can be integrated into building designs to reduce mortality from bird collisions. The goal of these glass options is to create a visual signal or cue to help birds detect and avoid glass. To make an effective virtual cue, all window treatment should be applied to at least the first two to three stories or the height of the adjacent vegetation. However, applying treatments to just the first story windows or known problem windows can be helpful as well.

Create Your Own Pattern

The key to creating bird-friendly glass is to increase visual noise on the surface of the glass. Visual noise is a visible pattern that breaks up transparent or reflective areas of glass enough that birds perceive they cannot fit through the transparent or reflective areas. There is still research needed to determine the most effective dimensions of various visual patterns on glass for bird strike prevention. However, in general, vertical stripes that are at least 1/4 inch wide with a maximum spacing of 4 inches, and horizontal stripes that are at least 1/4 inch wide with a maximum spacing of 2 inches have been effective at preventing strikes of most birds (Sheppard 2011; Klem 2009). Because hummingbirds are so much smaller than other birds, closer spacing of the elements of any pattern (striped or otherwise) will be necessary. Also, when using patterns other than stripes, closer spacing of elements is recommended because a series of smaller images like dots will not break up the glass as much as stripes using the 2" X 4" spacing rules.



The image shows how pattern spacing on glass can work to deter birds. Images by ABC and Roy Hancliff

Pattern color contrast is important as well. Use colors that contrast well against the background or reflections (e.g., white stripes may be more effective than black stripes if there is a consistent reflection of dark color on the glass surface). The image to the right depicts the importance of the contrast between the color of the window pattern and the background. Notice that the white stripes are significantly more visible than the black stripes with the dark reflections on this window.



Applying a product to the outer surface (surface #1) of the glass is always most effective. Applying a product to surface #2 or #3 (inner surfaces) can be effective if surface #1 is not so reflective that the pattern beneath is not visible to birds(see Fig. 1).

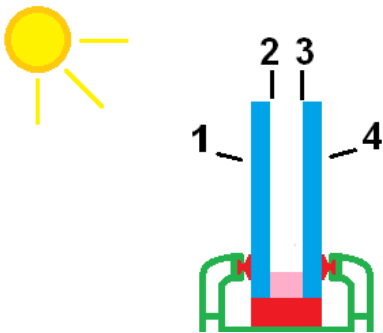


Image by NcLean/CC BY

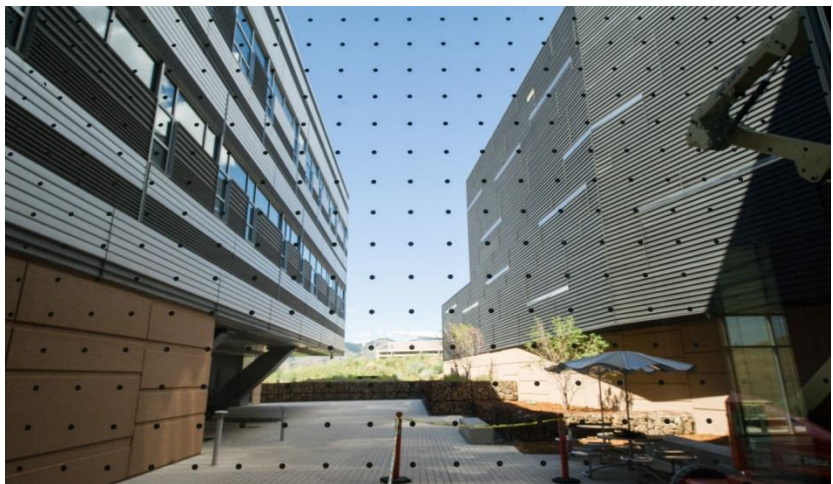
Fig 1: Window Surface Diagram – Depicts surface #1 (outside facing pane), surface #2 (inside of outside facing pane), surface #3 (inside of inside facing pane and) and surface #4 (inside facing pane).

This image shows an example of a striped glass pattern that can be effective for preventing strikes of most birds (smaller spacing may be needed for hummingbirds). This particular pattern has been applied to the exterior surface (surface #1) of the window.



Striped glass pattern. Photo by Christine Sheppard, ABC

This image shows an example of non-striped pattern that can be effective for preventing strikes of most birds (smaller spacing may be needed for hummingbirds). This pattern has also been applied to the exterior surface (surface #1) of the window.



Dot pattern applied to the exterior of a National Renewable Energy Laboratory (NREL) building to help prevent bird collisions. Dots are approximately 1/2" in diameter spaced 2" vertically and horizontally. Photo by Dennis Schroeder, NREL 31193

There are several ways you can create your own patterns on glass. To see recommendations for creating your own patterns on glass, visit the ***Solutions and Materials*** section of the [Bird-Safe Glass Foundation resources webpage](http://www.birdsafeglassfoundation.org/contact-us/resources/) (<http://www.birdsafeglassfoundation.org/contact-us/resources/>).

Install a Special Film, Glass or Covering

External Films and Coverings

There are several effective external film and glass covering options. Some options are more expensive, but are highly effective. Films are good for retrofit applications. A drawback, however, is that they only have a guarantee lifetime of 5 to 7 years, although they may last longer. To see a list of the latest recommendations in external films and covering products, visit the ***Solutions and Materials*** section of the [Bird-Safe Glass Foundation resources webpage](http://www.birdsafeglassfoundation.org/contact-us/resources/) (<http://www.birdsafeglassfoundation.org/contact-us/resources/>).



A bird friendly film was applied at the entrance of the Ding Darling Education Center at the J. N. "Ding" Darling National Wildlife Refuge. Photo shows entrance before (left) and after (right) application. Photos by USFWS

Fritted Glass

Fritting is the use of ceramic lines, dots or patterns that are most often placed on the #1 surface (outside-facing pane) or #2 or #3 (interior panes) (see [Fig. 1](#)) of insulated glass. Fritting is a commonly used measure, but is more expensive than other types of window coverings. This technique allows humans to see through the glass while reducing the transparency of the glass. It also provides energy savings by reducing heat gain, while still allowing day-lighting of buildings (Sheppard 2011). To see a list of the latest recommendations in fritted glass products, visit the ***Solutions and Materials*** section of the [Bird-Safe Glass Foundation resources webpage](http://www.birdsafeglassfoundation.org/contact-us/resources/)



Fritted glass on window. Photo by Christine Sheppard, ABC

(<http://www.birdsafeglassfoundation.org/contact-us/resources/>).

Ultraviolet Patterned Glass

Birds see in the ultraviolet (UV) spectrum so using glass that reflects UV light in a pattern can reduce bird collisions. While this glass is typically more expensive than other treatments, it is comparable in price to other energy-efficient glass (Eisenberg 2010). As of 2015, few UV patterned products are available. However, this option may be desired when seeking a product that is generally not visible to humans, but provides some benefit to birds. To see a list of the latest recommendations in ultraviolet patterned glass products, visit the ***Solutions and Materials*** section of the [Bird-Safe Glass Foundation resources webpage](http://www.birdsafeglassfoundation.org/contact-us/resources/) (<http://www.birdsafeglassfoundation.org/contact-us/resources/>).

Screens and Netting

Installing external screens or netting on windows is an effective and relatively inexpensive treatment. Screens reduce reflection and injury by providing a cushion between the bird and the window. This treatment can be installed on individual panes or attached to a façade. To be effective, the netting must be placed far enough in front of the window that a bird hitting it will not collide into the glass behind. The netting should have openings no larger than ½ inch. Several companies sell screens or other barriers that can be attached with suction cups or eye hooks. These treatments can be used on new construction, renovations, and retro-fits. To see a list of the latest recommendations in screen and netting products, visit the ***Solutions and Materials*** section of the [Bird-Safe Glass Foundation resources webpage](http://www.birdsafeglassfoundation.org/contact-us/resources/) (<http://www.birdsafeglassfoundation.org/contact-us/resources/>).



Basic home window screen. Photo by Christine Sheppard, ABC



Window netting installed feet from window on slanted wooden beams. Photo by USFWS

Architectural Features

Building designers can use features such as overhangs, shutters, louvers, mesh and awnings to reduce glass reflections or reduce visibility into transparent areas.



Shading was applied around the windows on the exterior of the Research Support Facility (RSF) at the National Renewable Energy Laboratory (NREL) to reduce glare and overheating of the building interior. These windows are also bird friendly. Photo by Dennis Schroeder, NREL 19798



Shutters overhang windows at a facility at the San Diego Zoo. Photo by Christine Sheppard, ABC

LIGHTING OPTIONS

Eliminating or reducing unnecessary lighting is one of the easiest ways to reduce collisions while also saving energy and reducing costs to building owners. Note that these measures will not eliminate collisions, and their effectiveness is highly dependent on local conditions, including the degree of bird friendly design and practices of neighboring buildings.



Lighting Design

- a. Avoid unnecessary lighting, including perimeter lighting.
- b. Install motion sensors on all lights (both interior and exterior) that activate only when people are present. Motion sensors are fairly inexpensive and save energy. This is especially important during the bird migration periods (early April through late May and mid-August through early November), and periods of inclement weather.
- c. Ensure all exterior lighting is “fully shielded” so that light is prevented from being directed skyward. “Fully shielded” light fixtures are defined as those with an opaque shield so that all light is emitted below the lowest light emitting part of the fixture. “Fully shielded” is the same as “zero up light” and “dark sky compliant”. See [Appendix A](#) for examples of acceptable fixtures.
- d. Comply with all Federal Aviation Administration obstruction and marking guidelines by ensuring that required obstruction lighting is comprised of only L-864 strobe lights with appropriate flash rates and extinguish all steady burning L-810 lights ([FAA 2007](#), Patterson 2012).

Lighting Operation

- a. Ensure that any lights that are not motion-activated are turned off at night; especially architectural lighting, upper story interior lighting, and lobby or atrium lighting.
- b. Eliminate the use of decorative/vanity lighting during the bird migration periods (early-April through late May and mid-August through early November). This includes upward directed spot- and flood-lights, and roof-top lighting.
- c. “Lights Out” programs exist throughout major cities across the country to encourage buildings to reduce light pollution during migration. For more information visit Audubon’s [Existing Lights Outs Programs](#) webpage (<https://www.audubon.org/conservation/existing-lights-out-programs>).
- d. Install window coverings to prevent light spill.

LANDSCAPING OPTIONS

Exterior

- Where habitat is adjacent to, seen through or reflected in any glass structures (e.g., windows, bus shelters, guard rails, glass walls, etc.), treat the glass using one of the [Glass Options](#) listed above. Avoid creating an effect where landscaping funnels birds towards glass panes (e.g., walkways, passageways, edges) or where approaches to a building (vehicles or people) flush birds towards windows.



An example of where trees and shrubs are reflected in the glass and create a type of funnel effect near the entrance of a building. Photo by USFWS

- Avoid using glass in supplemental structures (e.g., bus shelters, guard rails, glass walls, etc.). When it is not possible to avoid using glass for these structures, use only highly effective [Glass Options](#) to treat these structures (see the Birdsafe Glass Foundation website's (<http://www.birdsafeglassfoundation.org/contact-us/resources/>) list of tested materials for information on product effectiveness).

Interior

- If you have indoor plants, trees or shrubs, either treat the adjacent glass or move all plants away from clear glass windows far enough that they can't be seen from the outside by birds. If you were at window level looking in, could you see the plant? If the answer is "yes", then birds can probably see it too.



An example of where a potential bird hazard has been created by placing plants inside of a building near the window. Photo by USFWS

IMPLEMENTATION

Measures for a Residence

Assess your home's risk for bird collisions

Not all windows are equally hazardous. The most hazardous windows are likely those that are most reflective of bird habitat (e.g., trees, shrubs, flowers, sky), and closest to areas where you see birds when they are active.

Professional assistance is available to assess your home's risk for bird impacts, and to identify specific problem areas and apply avoidance/minimization measures. However, these services are likely at a cost to the homeowner. One example of this type of service is the Fatal Light Awareness Program (FLAP), which offers a risk assessment service for this purpose. To learn more about this service, visit the [FLAP BirdSafe Building Risk Assessment website \(http://www.flap.org/bird-safe-consulting.php\)](http://www.flap.org/bird-safe-consulting.php) and contact their assessment team to see if a local assessment can be arranged. You can also pinpoint problem areas by conducting regular monitoring around your home for dead or injured birds, or noting where you observe collisions.

You can also do your own assessment by conducting regular monitoring around your home, especially in areas that are potentially problematic. Monitoring can identify problem areas and tell you how frequent collisions occur. Monitoring is recommended even after collision prevention measures have been applied to ensure treatments are working. To monitor around your house, follow these basic steps in the early morning (around 8am or before) at least a few times a week and daily, if possible, during bird migration periods (early April through late May and mid-August through early November):

1. Walk around your house looking at the ground below windows for dead birds;
2. Inspect each window for feather spots or bird imprints; inspect windows daily when bird feeders are in use;
3. If you find a dead or injured bird, per 50CFR 21.31(a), you may pick it up only if you intent to take it immediately to a rehabilitator. If you do not intend to take the bird to a rehabilitator, you should not attempt to handle the bird, unless you are permitted to do so. If the bird is still alive and you would like to try to help it and/or you need to move the bird, locate a licensed wildlife rehabilitator where you can take the bird, or contact a wildlife official or agency or local licensed wildlife pest control company that is permitted for the possession, handling, transport, and disposal of migratory birds.
4. If helpful, maintain a personal log of information about any dead or injured birds you find during your searches including the species and locations where the birds were found. Logs can be useful for helping you remember where collisions occur and revealing recurring problem areas over time.

Basic guidance for monitoring can be found in the **Monitoring** section of the [Bird Safe Glass Foundation resources webpage](http://www.birdsafeglassfoundation.org/contact-us/resources/) (http://www.birdsafeglassfoundation.org/contact-us/resources/).

Implement Measures

After you have identified which windows may be causing bird collisions, you should follow the steps below to reduce the risk of collision.

1. Ensure proper operation of window covers

Proper operation of window covers can help reduce bird collisions, but should be paired with a window treatment using one of the [Glass Options](#) listed above for optimal results.

- **If you have blinds**, keep them partially opened during the daytime when birds are concentrated, especially during bird migration periods (early April through late May and mid-August through early November), and closed completely at night. A partially open blind during the day will appear as a striped pattern that can break up reflections.
- If, during the day, you notice birds are still colliding, it may mean a reflection is still occurring, and you should consider an exterior window treatment.
- **If you have shades**, apply a pattern to the shade on the window side and keep them closed as much as possible during the day, particularly when the room is not in use. Use strong contrasting colors in the design so the bird can see it through the window and any reflection. At night, close them completely to keep the escape of indoor lighting to a minimum.



[Photo](#) by Elf/ [WC PD](#)

2. Apply a window treatment

Exterior treatments applied on the outside of see-through windows and reflective glass is the most effective action to prevent bird-glass collisions. However, applying treatments on the inside can also be helpful. If you can see the markings from the outside of the window from window level, birds probably can too. Check this several times during the day, as reflections may only occur during certain light conditions. See options under [Glass Options](#) for a list of window treatment options for existing structures.

3. Distance bird feeders appropriately

Once you have treated your glass, be sure to place your bird feeder 3-feet or less from your windows; the closer, the better. If your feeders cannot be placed within 3 feet of a window, they should be placed at least 30 feet away.

4. Reduce light trespass

You can reduce light trespass into the environment with appropriate lighting structures and operation (refer to items under [Lighting Options](#)).

5. Follow landscaping best practices

Following landscaping best practices will ensure a hazardous condition is not created (refer to items under [Landscaping Options](#)).

Measures for Commercial and Institutional Buildings

Avoiding or reducing bird collisions with windows for commercial and institutional buildings can be challenging. First, office buildings have a wide range of architectural styles, floor levels, size, type and configuration of windows. All of these factors influence the risk of bird collisions. Second, occupants of commercial and institutional buildings may not own the building, making actions to reduce collisions more difficult. However, whether you own the building or are simply a building occupant, there are a number of measures you can take to make your building more bird friendly.

The following measures will help reduce bird attraction to your building, and many of them will save in overall building maintenance and energy costs.

Assess your building's risk for bird collisions

Professional assessments are available to assess your building's risk for bird impacts and for identifying specific problem areas (note: this is likely at a cost). The Fatal Light Awareness Program (FLAP) offers a risk assessment service for this purpose. To learn more about this service, visit the [FLAP BirdSafe Building Risk Assessment website \(http://www.flap.org/bird-safe-consulting.php\)](http://www.flap.org/bird-safe-consulting.php) and contact their assessment team to see if a local assessment can be arranged. There are also several ways to conduct your own assessment to identify potential problem areas. Not all windows are equally hazardous. Check to see which of your windows are most reflective of bird habitat (e.g., trees, shrubs, flowers, sky), and closest to areas where you see birds when they are active. You can also use direct observations of collisions (e.g., dead birds, feather prints on windows, etc.) to pinpoint problem areas.

An effective and recommended way to identify and verify problem areas is by monitoring regularly around your building for dead or injured birds, especially in areas that are potentially problematic. Monitoring can help you track and confirm where regular collisions are occurring and help you influence changes in these areas (e.g., moving plants away from windows) or open a dialogue with building management for where collision prevention measures may be necessary. Monitoring is recommended even after collision prevention measures are applied to ensure treatments are working properly. When establishing your monitoring program, follow these basic steps:

- Consider establishing a standardized monitoring plan that all employees helping with the monitoring effort can follow. Assign people to certain days and times, and map out the route to follow. It is suggested monitoring be done at least once in the early morning (around 8am or before) a few times a week and daily, if possible, during bird migration periods (early April through late May and mid-August through early November).
- Collect information about any dead or injured birds that employees report or find during building searches in a personal log. Logs can be useful for revealing recurring problem areas over time, and can help communicate and support why and where avoidance and minimization measures may be necessary to those who will need to assist in implementing these measures (e.g. building managers, building tenants).

- If you find a dead or injured bird, per 50CFR 21.31(a), you may pick it up only if you intent to take it immediately to a rehabilitator. If you do not intent to take the bird to a rehabilitator, you should not attempt to handle the bird, unless you are permitted to do s. If the bird is still alive and you would like to try to help it and/or you need to move the bird, locate a licensed wildlife rehabilitator where you can take the bird, or contact a wildlife official or agency or local licensed wildlife pest control company that is permitted for the possession, handling, transport, and disposal of migratory birds.

Basic guidance for monitoring, including suggested fields to be included in a tracking spreadsheet can be found in the **Monitoring** section of the [Bird Safe Glass Foundation resources webpage](http://www.birdsafeglassfoundation.org/contact-us/resources/) (<http://www.birdsafeglassfoundation.org/contact-us/resources/>).

Implement Measures

After you have identified which windows may be causing bird collisions, you should follow the steps below to reduce the risk of collision.

Use Window Covers (Blinds and Shades)

Window covers should be paired with a window treatment using one of the [Glass Options](#) listed above for optimal results in helping reduce bird collisions.

- **If you have blinds**, keep them partially opened during the daytime when birds are concentrated, especially during bird migration periods (early April through late May and mid-August through early November), and close them completely at night. A partially open blind during the day will appear as a striped pattern that can break up reflections. If, during the day you notice birds are still colliding, it may mean reflection is still occurring, and you should consider an outside window treatment.
- **If you have shades (and it is OK with building management to do so)**, apply a pattern to the shade on the window side and keep them closed as much as possible during the day, particularly when the room is not in use. Use strong contrasting colors in the design so the bird can see it through the window and any reflection. At night, close them completely to keep the escape of indoor lighting to a minimum.

Avoid or Minimize Evening Lighting

- **Building Occupants** – If the lights are on when you are leaving for the evening, turn the lights off, especially in windowed offices, and encourage others to do the same.
- **Building Owners** – Conduct building cleaning during the daytime. This will reduce bird incidents at night and provide energy and cost savings. Daytime cleaning may also result in salary savings by eliminating nighttime overtime cleaning costs.

Avoid or Minimize Interior Landscaping

If you have indoor plants, trees and shrubs, move them away from clear glass windows far enough that they can't be seen from outside by birds. If you can see the plant standing at window level and looking in, then birds can probably see it too.

Apply a Window Treatment or Barrier

If you are a building occupant, this is something you will likely have to work with building management to approve and implement since it requires modification of the building windows. However, if it is an option, exterior treatments applied on the outside of see-through windows and reflective glass is the most effective action to prevent bird-glass collisions. If exterior treatments are not an option, applying treatments on the inside can also be helpful. If you can see the markings from the outside of the window at window level, birds probably can too. Check this several times during the day, as reflections may only occur during certain light conditions See items under **Glass Options** for a list of window treatment options for existing structures.

Educate Others

Take steps to educate building owners and occupants about the risk of bird collisions and the simple steps that can be taken to reduce collisions such as turning off lights and closing window coverings at night.

Measures for New Buildings, Building Renovations and Retro-fits

Building Design

- Follow the [LEED Pilot Credit 55: Bird Collision Deterrence](http://www.usgbc.org/Docs/Archive/General/Docs10402.pdf) recommendations for new construction (<http://www.usgbc.org/Docs/Archive/General/Docs10402.pdf>).
- Minimize the number of, or co-locate roof-top antennas. Make all antennas free standing (i.e., no guy wires).
- Use [architectural features](#) to reduce the amount, reflectivity, and transparency of glass.
- If clear glass corridors, skyways, walkways, or courtyards are proposed it is imperative to use bird collision mitigation measures.

Glass Design/Pattern

- Avoid over-use of glass: keep the percentage of total glass below American Society of Heating, Refrigerating, and Air-Conditioning Engineers (ASHRAE) standard of 40% of surface area ([ANSI/ASHRAE/IES Standard 90.1 2013](#)).
- Use smaller pane sizes – less than 2.5 square meters - when possible.
- Do not use reflective glass. Use opaque, etched, or patterned glass that meets the suggested [pattern dimensions](#), or has a Materials Threat Score of less than 30 (see [LEED Pilot Credit 55: Bird Collision Deterrence](#); U.S. Green Building Council 2011). Refer to items 1-6 under [Glass Options](#) for glass and window design and treatment recommendations.

Lighting

- Refer to items under [Lighting Options](#) for best practice recommendations for lighting design and operation.

Landscaping

- Refer to items under [Landscaping Options](#) for landscaping best practices.

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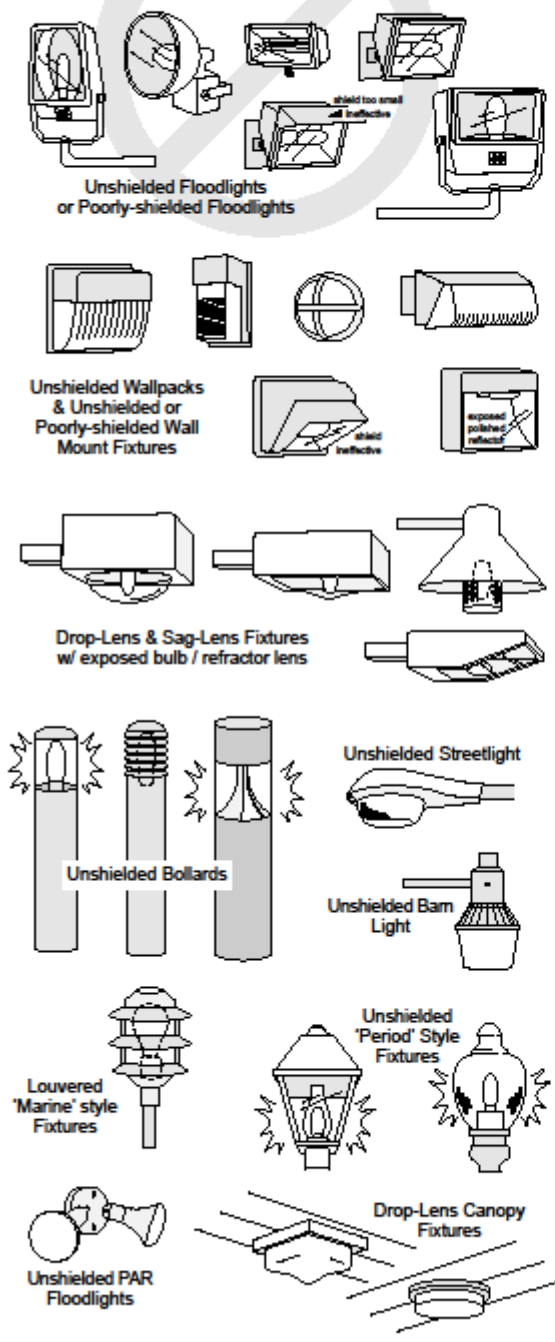
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APPENDIX A. Examples of lighting fixtures.

Examples of Acceptable / Unacceptable Lighting Fixtures

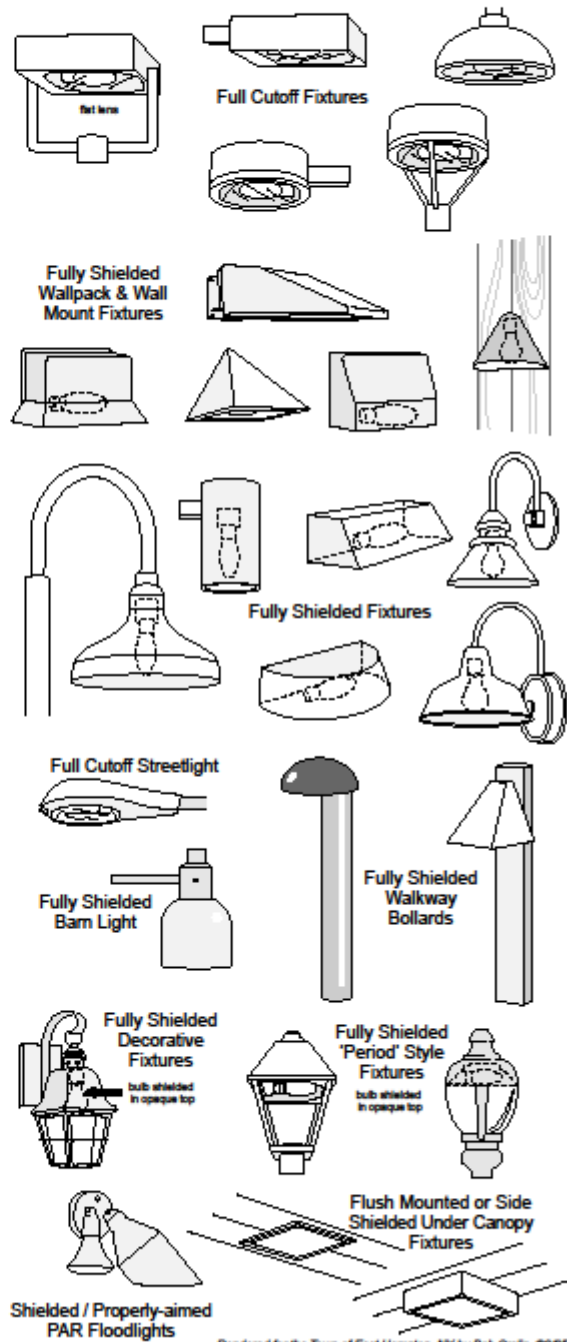
Unacceptable / Discouraged

Fixtures that produce glare and light trespass



Acceptable

Fixtures that shield the light source to minimize glare and light trespass and to facilitate better vision at night



Rendered for the Town of East Hampton, NY by Bob Crelin ©2005

TONY BOMKAMP
*Senior Biologist /
Regulatory Specialist*

YEARS OF EXPERIENCE

26 years

Professional start date: 1993

EDUCATION

MS, Environmental Studies,
California State University,
Fullerton, 1993

BA, Biology, California State
University, Fullerton, 1976

TEACHING EXPERIENCE

Adjunct Staff at California State
University Fullerton, Wetlands
Endangered Habitats and
Conservation of Migratory Birds,
1993 – Present

California Wetlands Conferences
Wetland Delineation/
Wetlands Consultants Ethics/
Arid West Supplement Field
Delineating/
Arid West Supplement,
CLE International,
2005/2006/2007/2009

Wetlands Law and Regulation,
ALI-ABA, 2006

TRAININGS ATTENDED

Arid West Supplement Wetland
Delineation Course,
Wetland Training Institute, 2007

Wetland Delineation with Emphasis
on Hydric Soils,
Wetland Training Institute, 2005

Basic Wetland Delineation Course
with Practicum,
Wetland Training Institute, 1996

GLENN LUKOS ASSOCIATES



PROFESSIONAL SUMMARY

Tony Bomkamp is a Botanist, Field Biologist, Wetlands Ecologist, and Regulatory Specialist with extensive wetlands expertise and diverse field experience and his botanical background spans 26 years working with all major vegetation communities in Southern California. He is a recognized authority in wetland delineation having conducted and supervised scores of wetland delineations, riparian habitat evaluations, and wetland functional assessments throughout California. Tony has processed hundreds of regulatory permits pursuant to Section 404 of the Clean Water Act, Section 1602 of the Fish and Game Code and Section 401 of the Clean Water Act. Tony has also designed and monitored numerous wetland mitigation sites throughout southern California. In addition to his own project work, Tony serves as GLA's Technical Director mentoring and supporting the biologists and regulatory specialists at GLA on well over 100 projects in a senior advisory role at GLA.

For 26 years Tony has served as an adjunct faculty member at California State University, Fullerton in the graduate environmental studies program instructing courses in wetlands and endangered habitats as well as conservation of migratory birds. In fall of 2019 Tony will be teaching a new course on "habitat restoration" for the CSF Fullerton Graduate Environmental Studies Program. He additionally has served as faculty for numerous Continuing Legal Education conferences on wetland delineation, wetland consultant ethics, and the Arid West Supplement from 2005 – 2009 and instructed a course on wetlands law and regulation for the American Law Institute and American Bar Association in 2006.

SELECTED PROJECT EXPERIENCE

ORANGE COUNTY GREAT PARK – HERITAGE FIELDS EL TORO; IRVINE, CALIFORNIA

Serving as Lead Biologist/Project Manager. Work includes managing extensive biological work to finalize the CEQA process with the City of Irvine including conducting surveys for rare plants, least Bell's vireo, burrowing owl, and raptors; directing and conducting biological monitoring; supervising pre-demolition surveys; and designing a wildlife corridor. Prepared responses to comments on the final EIR, which has been approved. Updated the jurisdictional delineation for the 3,580-acre area and prepared a jurisdictional delineation report. Provided support for obtaining Clean Water Act (CWA) Section 401 and 404 and Fish and Game Code (FGC) Section 1602 authorizations, including design of the habitat mitigation site within Agua Chino during the permitting process. Prepared an environmental assessment (EA)/alternatives analysis as well as habitat mitigation and monitoring plans. Finally, Mr. Bomkamp served as the lead biologist in developing and designing the Irvine Wildlife Corridor which is currently under construction

EAST ORANGE GENERAL PLAN COMMUNITY – THE IRVINE COMPANY; ORANGE COUNTY, CALIFORNIA

Served as Lead Biologist/Project Manager. Conducted extensive vegetation mapping of native habitats within the 10,000-acre study area including coastal sage scrub, native grassland, chaparral and riparian communities. Performed surveys for fairy shrimp, western spadefoot toad, and special-status plants including intermediate mariposa lily and many-stemmed dudleya. Conducted focused surveys for least Bell's vireo, protocol surveys for coastal California gnatcatcher, and a habitat assessment for special-status bats. Prepared a biological technical report for use in preparation of draft and final EIRs pursuant to CEQA, which included detailed impact analyses as well as development of mitigation measures necessary to ensure that all impacts to biological resources were reduced to less than significant. Additionally, prepared responses to comments on the final EIR, which the City of Orange certified. Additional work included conducting a jurisdictional delineation and preparing a jurisdictional delineation report as well as regulatory permit applications for which Section 401, 404, and 1600 authorizations were issued.

ORO CANYON FUEL MODIFICATION ZONE PROJECT – CITY OF LAGUNA BEACH; LAGUNA BEACH, CALIFORNIA

Serving as Senior Biologist. Manage biological work required for CEQA authorization. The span of work has ranged from conducting general and focused surveys for sensitive wildlife and plant species including coastal California gnatcatcher, least Bell's vireo, Pacific pocket mouse, tidewater goby, Laguna Beach dudleya, and big-leaved crownbeard to performing habitat assessments and vegetation mapping. Additionally, prepare a biological technical report addressing wildlife movement corridors, impacts to biological resources including special-status species, and mitigation measures. The Laguna Beach City Council has approved an MND.

NEWPORT BANNING RANCH – NEWPORT BANNING RANCH, LLC; NEWPORT BEACH, CALIFORNIA

Serving as Senior Biological/Regulatory Consultant. Managed biological work required for CEQA authorization including directing and conducting general biological surveys; rare plant surveys; and focused least Bell's vireo, raptor, burrowing owl, and fairy shrimp surveys. Additionally, supervised and conducted focused surveys for coastal California gnatcatcher, southwestern willow flycatcher, and cactus wren. Conducted vegetation mapping, prepared a biological technical report for use in preparation of draft and final EIRs pursuant to CEQA, and prepared responses to comments on the final EIR. Additionally, led a team of regulatory specialists in updating the CWA Section 404 jurisdictional delineation for the site, prepared a jurisdictional delineation report, and directed and participated in public outreach workshops. The City of Newport Beach has approved the project and certified the EIR.

SPECIAL AREA MANAGEMENT PLAN (SAMP), VARIOUS PLANNING AREAS, AND INFRASTRUCTURE – RANCHO MISSION VIEJO (RMV); SAN JUAN CAPISTRANO, CALIFORNIA

Serving as Project Manager/Wetland Regulatory Specialist/Botanist. Work has included providing biological support relevant to CEQA and NEPA in addition to regulatory and mitigation support including conducting a jurisdictional delineation for approximately 8,000 acres of the 23,000-acre special area management plan (SAMP) study area associated with Rancho Mission Viejo's "Ranch Plan" (i.e., EIR) study area and verifying the delineation with the U.S. Army Corps of Engineers and California Department of Fish and Wildlife (CDFW); preparing responses to comments on the Ranch Plan; applying for permits and coordinating CWA Section 404 processing in accordance with SAMP and the master streambed alteration agreement with CDFW; analyzing impact assessments and preparing a wetland functional assessment for the Regional Water Quality Control Board; reviewing grading plans; performing and directing rare plant surveys throughout the study area; designing and implementing protocols for a rare plant translocation program including for many-stemmed dudleya, intermediate mariposa lily, thread-leaved brodiaea, and southern tarplant; implementing a five-year management action plan for thread-leaved brodiaea, many-stemmed dudleya, Coulter's saltbush, and southern tarplant as well as a large-scale many-stemmed dudleya restoration project with five receptor sites and more than 3,100 plants installed, which are meeting success criteria. The County of Orange has approved the Ranch Plan and certified the EIR.

ESPERANZA HILLS DEVELOPMENT PROJECT – YORBA LINDA ESTATES; LLC, CITY OF YORBA LINDA, CALIFORNIA

Serving as Lead Biologist. Conducted a jurisdictional delineation of the 631-acre site and prepared a jurisdictional delineation report. Directed and performed protocol surveys for coastal California gnatcatcher and least Bell's vireo. Prepared a biological assessment as well as a biological technical report for use in

preparation of draft and final EIRs pursuant to CEQA. Prepared CWA Section 401 and 404 and FGC Section 1602 notifications, an EA/alternatives analysis, as well as habitat restoration/mitigation plans. Currently processing CWA Section 401 and 404 and FGC Section 1602 authorizations. Prepared responses to comments on the public notice as well as the final EIR, which the County of Orange has certified. Attended public hearings.

SEASP ESHA EVALUATION – PLACEWORKS FOR CITY OF LONG BEACH, CALIFORNIA

Served as Senior Biologist. GLA conducted an evaluation of Environmentally Sensitive Habitat Area (ESHA) as defined under the California Coastal Act for the Southeast Area Specific Plan (SEASP). Tasks included: development of ESHA Criteria based on previous Commission ESHA determinations and guidance from the Commission's ecologists, vegetation mapping consistent with current Commission standards for identifying "rare" and "endangered" vegetation alliances, surveys for special-status plants that meet the Commission's criteria for ESHA; conducted habitat assessments and surveys for special-status animals that meet the Commission's criteria for ESHA; prepare report identifying all areas within the SEASP area that meeting the Commission's ESHA criteria; coordination with City staff and stakeholders.

MARBLEHEAD COASTAL DEVELOPMENT PROJECT – R.J.MEADE CONSULTING; SAN CLEMENTE, CALIFORNIA

Served as Senior Biologist/Project Manager. Conducted a jurisdictional delineation for obtaining CWA Section 401 and 404 and FGC Section 1602 authorizations as well as a Coastal Development Permit for the 250-acre site. Directed and performed vegetation mapping, wildlife movement studies, burrowing owl surveys, and coastal California gnatcatcher surveys. Conducted rare plant surveys for and mapped locations of Coulter's saltbush. Designed and prepared a habitat restoration/mitigation plan. Directed and conducted construction monitoring and implemented habitat restoration. Attended meetings with the U.S. Fish and Wildlife Service and California Coastal Commission.

UPPER LOS CERRITOS WETLAND MITIGATION BANK – BEACH OIL MINERAL PARTNERS; CITY OF LONG BEACH, CALIFORNIA

Served as Lead Biologist. Performed and/or directed all biological studies and surveys in support of the Los Cerritos Mitigation Bank. Tasks included: coordination of expert biologists in performing various focused flora and faunal surveys; performance of the wetland delineation for federal and state jurisdictional wetlands; and performance of focused botanical surveys and surveys for the State-listed Belding's savannah sparrow.

CANYON HILLS DEVELOPMENT PROJECT—CHRISTOPHER A. JOSEPH & ASSOCIATES; CITY OF LOS ANGELES, CALIFORNIA

Served as Lead Biologist/Project Manager. Conducted the jurisdictional delineation for the 900-acre site and prepared a jurisdictional delineation report. Conducted vegetation mapping, general wildlife surveys, and general and focused botanical surveys. Performed protocol surveys for coastal California gnatcatcher and focused surveys for least Bell's vireo. Produced a biological technical report for use in preparation of environmental documents pursuant to CEQA. Prepared Section 401, 404, and 1602 notifications and an EA/alternatives analysis. Processed 401, 404, and 1602 authorizations and prepared a wetland/riparian mitigation plan. Responded to public notice comments to finalize the CEQA process. CEQA was approved for the project.

ST. MICHAEL'S ABBEY PROJECT – ST. MICHAEL'S ABBEY; SILVERADO, CALIFORNIA

Serving as Senior Biologist. Performs and directs biological surveys for purposes of CEQA including vegetation mapping and focused surveys for coastal California gnatcatcher, cactus wren, raptors, burrowing owl, arroyo toad, and rare plants. Prepared a biological technical report for use in draft and final EIRs and responses to comments for the final EIR. The County of Orange approved the project and certified the EIR. Habitat restoration has been implemented and construction monitoring is ongoing as needed.

INTERSTATE 215 WIDENING FROM SCOTT ROAD TO NUEVO ROAD – ICF INTERNATIONAL/RIVERSIDE COUNTY TRANSPORTATION COMMISSION; CITIES OF PERRIS AND MENIFEE AND UNINCORPORATED RIVERSIDE COUNTY, CALIFORNIA

Serving as Project Manager. The project consists of the widening of the section of I-215 between Scott Road and Nuevo Road. GLA conducted a California Rapid Assessment Method (CRAM) analysis of vernal pools that would be impacted by the project and designed a mitigation program to compensate for the impacts which

included creation of vernal pools immediately south of Ramona Expressway and west of the San Jacinto River channel. GLA also designed and implemented mitigation for two-special status plant species, smooth tarplant (*Centromadia pungens* ssp. *laevis*) and San Jacinto Valley crownscale (*Atriplex coronata* var. *notatior*). The project is in its fourth year of implementation.

ROAD CROSSING OF THE SAN JACINTO RIVER BETWEEN GOETZ ROAD AND 2,500 LINEAR FEET SOUTHERLY OF ETHANAC ROAD – RICHLAND COMMUNITIES; CITY OF PERRIS, RIVERSIDE COUNTY, CALIFORNIA

Serving as Project Manager. The project consists of construction of a road crossing over the San Jacinto River between Goetz Road and 2,500 linear feet southerly of Ethanac Road. GLA's work includes preparation of a Biological Technical Report and a jurisdictional delineation report to satisfy the requirements of CEQA and regulatory agency permitting requirements. Specifically, GLA conducted a jurisdictional delineation, vegetation mapping, habitat assessments, and performed focused surveys for special-status plants and focused protocol surveys for least Bell's vireo and southwestern willow flycatcher.

EMPLOYMENT HISTORY

Glenn Lukos Associates. Senior Biologist/Regulatory Specialist. Lake Forest, California. 1993 – 1995 and 1997 – Present.

California State University, Fullerton. Adjunct Faculty – Environmental Studies Program. Fullerton, California. 1993 – Present.

Michael Brandman Associates. Botanist/Wetlands Specialist. Irvine, California. 1995 – 1997.

California State University, Fullerton. Graduate Assistant for Southern California Waterbody Study. Fullerton, California. 1990 – 1993.

California State University, Fullerton. Graduate Assistant for Field Botany. Fullerton, California. 1992.