COUNTY OF EL DORADO
SIGN ORDINANCE UPDATE
FINAL ENVIRONMENTAL IMPACT REPORT
SCH#2014102001

Prepared for:
COUNTY OF EL DORADO
2850 FAIRLANE COURT
PLACERVILLE, CA  95667

Prepared by:
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RANCHO CORDOVA, CA  95670

MARCH 2015
1.0 INTRODUCTION
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1.1 PURPOSE OF THE EIR PROCESS

As prescribed by State CEQA Guidelines Sections 15088 and 15132, the lead agency, El Dorado County, is required to evaluate comments on environmental issues received from persons who have reviewed the Draft Environmental Impact Report (EIR) and to prepare written responses to those comments.

The Final EIR for this project comprises this document, together with the Draft EIR (incorporated by reference in accordance with State CEQA Guidelines Section 15150). The Draft EIR is available at the Community Development Agency Planning Services Public Counter located at 2850 Fairlane Court, Building C, Placerville, CA 95667 or online on the County website at:


This Final EIR contains public comments received on the Draft EIR (SCH No. 2014102001) for the proposed comprehensive update of the County of El Dorado Sign Ordinance (Project). Written comments were received by El Dorado County (County) during the public comment period from December 31, 2014, through February 17, 2015.

This Final EIR includes written responses to each written and verbal comment on environmental issues raised in comments on the Draft EIR during the public review period for the DEIR. The responses in the Final EIR clarify the text in the Draft EIR, as appropriate. In accordance with State CEQA Guidelines Section 15088(b), the written responses describe the disposition of significant environmental issues raised. El Dorado County and its consultants have provided a good faith effort to respond in detail to all significant environmental issues raised by the comments.

This Final EIR also contains minor corrections and revisions made to the Draft EIR (see Errata Section 4.0) initiated by County staff and/or consultants based on their ongoing review.

This document has been prepared in accordance with the California Environmental Quality Act (CEQA; Public Resources Code Sections 21000–21177). Pursuant to CEQA requirements, El Dorado County must certify the Final EIR as complete and adequate prior to approval of the project.

1.2 PROJECT UNDER REVIEW

The proposed project consists of the adoption and implementation of a comprehensive update to the County's existing Sign Ordinance (Chapter 17.16 of the Zoning Ordinance). Note that the Board of Supervisors recently recodified the County Ordinance Code and the Zoning Ordinance, which was previously Title 17 of the Code, is now Title 130. Since all the public drafts of the Sign Ordinance update and the related environmental documents have referenced the Sign Ordinance as Chapter 17.16 of the Zoning Ordinance, the FEIR will continue to refer to the Sign Ordinance as Chapter 17.16 and the Zoning Ordinance as Title 17. However, in keeping with the recodification, when adopted, the Sign Ordinance will be incorporated into the Code as Chapter 130.16, not 17.16.

The Sign Ordinance update is intended to ensure that signs are consistent with the visual and aesthetic goals and policies set by the El Dorado County General Plan and protect the county's visual character and scenic landscapes. The Planning Commission and the Board of Supervisors will also consider amendments to 2004 General Plan Objective 2.7.1 and corresponding Policy
2.7.1.2 pertaining to billboards along designated scenic corridors. (See subsection 2.3.3 of the Draft EIR for proposed amendment language.) The proposed project does not involve amendments to the County General Plan land use designations or zoning districts, nor does it grant any new entitlements or approvals for specific signs.

The intent of the standards is to ensure that signage is consistent with its physical surroundings and does not detract from the surrounding visual character or cause safety hazards. The proposed Sign Ordinance update would generally be more restrictive than the existing ordinance, in that it provides standards with more specificity regarding sizing, location, and content. The proposed update provides for the use of electronic (digital) signs that may use animation, flashing, scrolling, or video screens under certain conditions (e.g. signs shall not change message more than once every 8 seconds), whereas the existing Sign Ordinance specifically prohibits all flashing or moving signs. The updated ordinance would also provide for abatement or removal of illegal, abandoned, and nonconforming signs as allowed by state law. The proposed Sign Ordinance update would provide sign regulations for signs in the unincorporated areas of the county on private property, County property, and land owned by public entities over which the County has land use regulatory authority. The proposed Sign Ordinance update would provide for signs that are consistent with the goals and objectives of the El Dorado County General Plan (2004) and the community’s visual and aesthetic goals.

1.3 Organization of This Document

For this Final EIR, comments and responses are grouped by letters from agencies, groups, and individuals. Because the subject matter of one topic may overlap between letters, responses may refer to one or more responses to review all the information on a given subject. To assist the reader, cross-references are provided. The comments and responses that make up the Final EIR, in conjunction with the Draft EIR, as amended by the text changes, constitute the EIR that will be considered for certification by El Dorado County.

The Final EIR is organized as follows:

Section 1 - Introduction: This section includes a summary of the project description and the process and requirements for a Final EIR.

Section 2 - List of Agencies and Persons Commenting: This section contains a list of all agencies or persons who submitted comments on the Draft EIR during the public review period.

Section 3 - Comments and Responses: This section contains the comment letters received on the Draft EIR and the corresponding response to each comment. Public agency letters are given a letter designation, while private organizations and individuals are given a number designation, and each comment on an environmental issue in the letter is given a number designation. Responses are provided after the letter in the order in which the comments appear. Where appropriate, responses are cross-referenced between letters. The responses following each comment letter are intended to supplement, clarify, or amend information provided in the Draft EIR or refer the commenter to the appropriate place in the document where the requested information can be found. Comments not directly related to environmental issues may be discussed or noted for the record.

Section 4 - Errata: This section contains minor corrections and revisions made to the Draft EIR initiated by County staff and/or consultants based on their ongoing review.
1.4 Public Participation and Review Process

Pursuant to CEQA Guidelines Section 15082, the County released a Notice of Preparation (NOP) on October 1, 2014, with a 30-day comment period. The County distributed the NOP to the State Clearinghouse for public and agency review. The NOP was also posted on the County website home page, under News & Hot Topics (http://www.edcgov.us/). In addition, e-mail notices were sent to the Long Range Planning subscriber list and to all the individuals who submitted comments on the July 2013 draft Sign Ordinance, as well as to other County commissions/committees, other agencies, and chambers of commerce.

The purpose of the NOP was to provide notification that an EIR for the project was being prepared and to solicit guidance on the scope and content of the document. The NOP and comments received on the NOP during the public review comment period are provided in Appendix A of the Draft EIR.

The County held a scoping meeting for the project on October 24, 2014. The NOP and comments received on the NOP during the public review period (October 1 through October 31, 2014) are provided in Appendix A of the Draft EIR.

The Draft EIR was circulated for public review and comment for a period of 45 days from December 31, 2014, to February 17, 2015. A public meeting was held on January 29, 2015 to receive comments on the Draft EIR for this project.
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2.0 LIST OF AGENCIES AND PERSONS COMMENTING
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2.1 COMMENTER LIST

The following representatives of agencies, organizations, groups, and individuals submitted comments on the Draft EIR:

<table>
<thead>
<tr>
<th>Letter</th>
<th>Individual or Signatory</th>
<th>Affiliation</th>
<th>Date Submitted</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Dyana Anderly</td>
<td>Cameron Park Design Review Committee</td>
<td>January 29, 2015</td>
</tr>
<tr>
<td>B</td>
<td>Mary Cahill</td>
<td>Cameron Park Community Services District</td>
<td>February 17, 2015</td>
</tr>
<tr>
<td>C</td>
<td>Scott Morgan</td>
<td>California Office of Planning and Research</td>
<td>February 17, 2015</td>
</tr>
<tr>
<td>1</td>
<td>Bob Caldwell</td>
<td>Resident</td>
<td>January 15, 2015</td>
</tr>
<tr>
<td>2</td>
<td>Greg Redeker</td>
<td>Stott Outdoor Advertising</td>
<td>January 15, 2015</td>
</tr>
<tr>
<td>3</td>
<td>Eric Driever</td>
<td>Resident, Cameron Park</td>
<td>January 29, 2015</td>
</tr>
<tr>
<td>4</td>
<td>Robert A. Smart, Jr.</td>
<td>Resident, Diamond Springs</td>
<td>January 29, 2015</td>
</tr>
<tr>
<td>5</td>
<td>Robert A. Smart, Jr.</td>
<td>Resident, Diamond Springs</td>
<td>January 30, 2015</td>
</tr>
<tr>
<td>6</td>
<td>Gary Miles</td>
<td>Resident, El Dorado</td>
<td>January 30, 2015</td>
</tr>
<tr>
<td>7</td>
<td>Gary Miles</td>
<td>Resident, El Dorado</td>
<td>February 3, 2015</td>
</tr>
<tr>
<td>8</td>
<td>Cheryl Langley</td>
<td>Resident, Shingle Springs</td>
<td>February 17, 2015</td>
</tr>
<tr>
<td>9</td>
<td>Karen Warner</td>
<td>Resident, Shingle Springs</td>
<td>February 17, 2015</td>
</tr>
<tr>
<td>10</td>
<td>Timothy Costello</td>
<td>Resident, Shingle Springs</td>
<td>February 17, 2015</td>
</tr>
<tr>
<td>11</td>
<td>Sue Taylor</td>
<td>Resident, Camino</td>
<td>February 17, 2015</td>
</tr>
<tr>
<td>12</td>
<td>Dyana Anderly</td>
<td>Resident, Cameron Park</td>
<td>February 17, 2015</td>
</tr>
</tbody>
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3.0 COMMENTS AND RESPONSES
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3.1 REQUIREMENTS FOR RESPONDING TO COMMENTS ON A DRAFT EIR

CEQA Guidelines Section 15088 requires the lead agency to evaluate all comments on environmental issues received on the Draft EIR and prepare a written response. The written response must address the significant environmental issue raised and must provide a detailed response, especially when specific comments or suggestions (e.g., additional mitigation measures) are not accepted. In addition, the written response must be a good faith and reasoned analysis. However, lead agencies need only to respond to significant environmental issues associated with the project and do not need to provide all the information requested by a comment, as long as a good faith effort at full disclosure is made in the EIR (CEQA Guidelines Section 15204).

CEQA Guidelines Section 15204 recommends that commenters provide detailed comments that focus on the sufficiency of the Draft EIR in identifying and analyzing the possible impacts on the environment and ways in which the significant effects of the project might be avoided or mitigated. CEQA Guidelines Section 15204 also notes that commenters should provide an explanation and evidence supporting their comments. Pursuant to CEQA Guidelines Section 15064, an effect will not be considered significant in the absence of substantial evidence.

CEQA Guidelines Section 15088 also recommends that where the response to comments results in revisions to the Draft EIR, those revisions be noted as a revision to the Draft EIR or in a separate section of the Final EIR.

3.2 COMMENTS RECEIVED AT THE PUBLIC MEETING FOR THE DRAFT EIR

El Dorado County held a public meeting to take comments on the Draft EIR for the project on January 29, 2015. The following provides a summary of comments received at the public meeting, along with a response or reference to a response to the commenter’s written comments.

<table>
<thead>
<tr>
<th>Commenter</th>
<th>Comment</th>
<th>Response</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dyana Anderly</td>
<td>The project fails to meet the project objectives related to promoting visually attractive communities; 20-foot-tall signs are distracting to drivers; there is visual clutter in scenic areas.</td>
<td>See responses to Comments A-1 through A-11</td>
</tr>
<tr>
<td>Eric Driever</td>
<td>Effects on Highway 49 corridor; doesn’t consider regional standards regarding sign height; tall signs would result in visual blight.</td>
<td>See responses to Comments 3-4, 3-2, 3-1, and A-3</td>
</tr>
<tr>
<td>Robert A. Smart, Jr.</td>
<td>Believed the proposed ordinance would result in removal of existing billboards in Cameron Park and Shingle Springs.</td>
<td>The existing billboards are part of the existing condition. Because they are not a result of the project, mitigation cannot be included to eliminate these signs.</td>
</tr>
<tr>
<td>Sue Taylor</td>
<td>Billboards were not resolved with the updated code; this will add more light and glare.</td>
<td>The proposed Sign Ordinance prohibits new billboards, but existing billboards would be allowed to remain. The DEIR acknowledged the addition of light and glare.</td>
</tr>
</tbody>
</table>
3.0 COMMENTS AND RESPONSES

<table>
<thead>
<tr>
<th>Commenter</th>
<th>Comment</th>
<th>Response</th>
</tr>
</thead>
<tbody>
<tr>
<td>Karen Warner</td>
<td>The existing billboards in Shingle Springs are visual obstructions.</td>
<td>The proposed Sign Ordinance prohibits new billboards, but existing billboards would be allowed to remain.</td>
</tr>
<tr>
<td>Jane Layton</td>
<td>Expressed an opinion that signs should be limited in Cameron Park to save the visual setting.</td>
<td>This is not a comment on the adequacy of the EIR.</td>
</tr>
</tbody>
</table>

glare associated with new digital signs (Impact 3.1-4), which was determined to be significant and unavoidable.

3.3 RESPONSES TO COMMENT LETTERS

Written comments on the Draft EIR are reproduced on the following pages, along with responses to those comments. To assist in referencing comments and responses, the following coding system is used:

Public agency comment letters are coded by letters, and each issue raised in the comment letter is assigned a number (e.g., Comment Letter A, comment 1: A-1).

Individual and interest group comment letters are coded by numbers, and each issue raised in the comment letter is assigned a number (e.g., Comment Letter 1, comment 1: 1-1).

Where changes to the Draft EIR text result from responding to comments, those changes are included in the response and demarcated with revision marks (underline for new text, strikeout for deleted text).
Letter A
COMMUNITY DEVELOPMENT AGENCY
LONG RANGE PLANNING
2850 Fairlane Court, Placerville, CA 95667
Phone (530) 621-4650, Fax (530) 642-0508

January 29, 2015

Sign Ordinance Update Draft EIR Meeting Comment Form

Please provide your comments on the Sign Ordinance Update Draft EIR. Comments should focus on the sufficiency of the Draft EIR in identifying and analyzing the possible impacts on the environment and ways in which potential significant effects of the project might be avoided or mitigated. Comments are most helpful when they suggest specific alternatives or mitigation measures that would provide better ways to avoid or mitigate potential significant environmental effects. You can provide this form with your written comments to staff at this meeting or mail or email your comments, prior to 5:00 p.m. on Tuesday, February 17, 2015, to:
Anne Novotny, Senior Planner
El Dorado County Community Development Agency, Long Range Planning
2850 Fairlane Court, Placerville, CA 95667
Email: anne.novotny@edcgov.gov Fax: (530) 642-0508

Name: Cemex Park Design Review Committee

Address:

Comments: Attached
It appears that Cameron Park will be the community most impacted by the signs that would be allowed in the proposed El Dorado County Sign Ordinance. The Executive Summary of the draft EIR states,

The County recognizes that signs are an essential element of a community’s visual appearance and provide a means to identify and promote local establishments. Signs provide useful information to the public, but should not become visual distractions along public roadways.

More should be said other than that signs “should not become visual distractions along public roadways.” There should also be a statement that signs should not be the source of visual blight, they should not be unsightly, they should not contribute to sign clutter, they should not detract from the natural element or the built environment, and they should be consistent with the officially adopted design guidelines for each El Dorado County community.

The Executive Summary indicates that the “no digital signs” alternative is the environmentally superior option; however, there was no alternative that considered eliminating or reducing the size of the proposed 60-foot-high multi-tenant Highway 50-oriented signs, which are likely to be the most visually offensive signs of all proposed signs. Also of significant visual impact would be the single tenant signs, which can be 24 feet high, and the clutter that could be associated (by right) with single-tenant signs outside the Highway 50 corridor which have no separation requirements and can be 12-feet high.

The main environmental issue associated with sign is the visual aspect of them, i.e., their potential aesthetic impact on the environment. The Cameron Park Design Review Committee requested that the EIR display pictures of what the environment might look like should signs be permitted as proposed. For example, what would the visual impact be of 60-foot-high signs marching up Highway 50 in Cameron Park? That is as tall as a 6-story building. Also, try to envision a shopping center where each single tenant could have a 12-foot high sign. How can decision-makers possibly make an intelligent judgment about visual impacts unless there is a visual representation of what the environment might look like with signs as proposed? In our opinion there is the potential for the proposed sign ordinance to substantially degrade the existing visual character or quality of the site and its surroundings of the signs that are allowed. The Executive Summary states,

This document is a programmatic EIR that is intended to provide a broad analysis of the proposed countywide sign standards which apply to many different sign types and locations. Therefore, descriptions and/or analysis of individual signs would not be appropriate and would be beyond the scope of this document.

Comments by Cameron Park Design Review Committee
Letter A Continued

The Design Review Committee recognizes that, as a programmatic document, the EIR does not address individual signs. However, from a cumulative standpoint, 60-foot high signs may be a significant impact on the environment, particularly in Cameron Park and Shingle Springs. Signs can contribute in a more positive way to community identity than what is proposed. The Committee is unaware of any visual analysis that was conducted that would have concluded that 60-high signs are necessary to adequate identification and that they would be an attractive addition to our communities. Even most urban cities do not allow signs that are that tall.

The proposed Sign Ordinance prohibits the reviewing body from denying Highway 50-oriented signs that meet height and area criteria. No use permit would be required, and there could be no judgment made as to how this sign fits in with its surroundings, conflicts with it, or diverts attention from the roadway. The proposed ordinance states, "U.S. Highway 50-Oriented Signs. A Design Review Permit shall be required for all U.S. Highway 50-Oriented signs located within 100 feet of the designated state highway. The approval of a Design Review Permit is a ministerial project pursuant to CEQA when in compliance with adopted standards set forth in Section 17.16.070." This provision erroneously depends on the determination of the EIR document that there would be no significant impact on the environment.

Pictures are necessary to determine visual impacts on the environment. There is already sign clutter in Cameron Park and Shingle Springs, and a visual representation of what could occur with adoption of the proposed sign ordinance that allows 60-foot-high signs will likely show that additional very tall signs will exacerbate this situation. The same holds true for the single-tenant signs that could be quite numerous and add significantly to sign clutter. The signs depicted below are less than 60 feet high, and they are unnecessarily high for adequate identification. The proposed Sign Ordinance indicates that Highway-50 oriented signs are to be a ministerial action, meaning that if they meet the height, area and setback requirements they cannot be denied. In effect, without a visual analysis of the impacts of these large signs, there is to be no further environmental review.
Letter A Continued

The State of California provides for small blue signs near freeway off-ramps which provide motorists with information regarding food, fuel and lodging. The use of these signs as a project alternative in the EIR would be appropriate.

The Executive Summary lists project objectives, including:

☐ Promote economically stable and visually attractive communities within the county.
☐ Promote signs and graphics that are attractive, pleasing, and harmonized with the physical character of the structure and environment of surrounding properties.
☐ Protect viewsheds in designated scenic corridors.
☐ Encourage individuality among communities and businesses through signage.

The Executive Summary also points out that the General Plan is proposed to be adopted that will allow billboards to be relocated to outside designated Scenic Corridors. Furthermore,
Letter A Continued

signs along Highway 50 in the scenic corridor are proposed to be shorter than those outside the scenic corridor. A visual representation of what the difference is would help decision makers decide if this proposal is to be adopted.

A study is to be done to indicate if the scenic corridor can be extended to the west of Placerville. However, with the recent addition of offensive billboards in these areas that impede the views of the sierras and other natural features, it is dubious that Highway 50 in the vicinity of Cameron Park and Shingle Springs will be designated as a scenic corridor. But, what does that have to do with making sure that signs along all segments of Highway 50 are attractive? The notion that signs should be more sensitive to their surroundings and not impede the views of the natural environment ONLY IN THE DESIGNATED SCENIC CORRIDORS is offensive to those of us in Cameron Park who want an attractive community. A sign ordinance should require attractive signs that contribute in visually positive ways to all communities in El Dorado County and that do not impede attractive settings. The notion that attractive signs should be provided for along a scenic corridor and less attractive signs may be allowed elsewhere does not take advantage of this opportunity to improve the aesthetic quality of the entire county. The aesthetic impacts of this provision of the Sign Ordinance should not be considered “no impact” or “less than significant impact.”

Cameron Park and Shingle Springs are already riddled with sign clutter, and to allow relocation of billboards to our area solely because it may be outside a designated scenic corridor would further denigrate our skyline and contribute to visual blight. There should at least be a provision for amortization and possible buy-out of billboards.

The proposed Sign Ordinance would allow 20-foot high pole signs on local streets. There should be a visual representation of the result of adopting such a provision. This representation would show that there could be an adverse visual impact, both aesthetically and as a distraction to motorists who would have to take their eyes off the road to view such signs. In addition, the 20-height would likely interfere with tree canopies, which often results in severely pruning trees to make the sign more visible or even removing trees. A visual representation would reveal that a 6 – 10-foot sign would be more in the line of sight of motorists.

Note on the following page the line of sight of motorists trying to view tall signs and that they would have to take their eyes from the road to read the tallest sign. A picture is worthwhile for determining impacts on the environment.
Letter A Continued

Additional comments from the Cameron Park Design Review Committee may be forthcoming.
LETTER A – DYANA ANDERLY, CAMERON PARK DESIGN REVIEW COMMITTEE

Response A-1:

The commenter provides an excerpt from the Executive Summary of the Draft EIR. The commenter believes the Sign Ordinance should more clearly support signs that do not adversely affect aesthetic resources and are consistent with the County’s adopted design guidelines.

The comment refers to a subsection of the Executive Summary of the DEIR that discusses project background and is not intended to provide analysis or mitigation for the project. The commenter is referred to DEIR Section 3.1, Aesthetics, for a discussion of the project’s potential impacts on aesthetic resources. The commenter is also referred to Response 3-1 for a discussion of visual blight.

Response A-2:

The commenter states that the DEIR does not consider a project alternative that would prohibit or further limit the size of multi-tenant and single-tenant Highway 50-oriented signs. The commenter believes such signs would result in the greatest visual impacts.

As discussed in DEIR Section 3.1, Aesthetics, the proposed project would not result in a significant impact on scenic views or visual character or quality. Thus, the EIR need not evaluate an alternative that is designed to reduce impacts in developed areas along the Highway 50 corridor. Consistent with Section 15126.6 of the CEQA Guidelines, the DEIR (Section 4.0) provides a reasonable range of alternatives and evaluates the comparative merits of the alternatives to foster informed decision-making and public participation. An EIR need not consider every conceivable alternative to a project.

Response A-3:

The commenter previously requested that the DEIR provide visual simulations of possible future signs in the county should the proposed Sign Ordinance be approved and implemented to help the reader better judge potential visual impacts. The comment specifically refers to “60-foot-high signs marching up Highway 50 in Cameron Park.” The commenter further states that while the DEIR is a programmatic EIR, it should analyze the potential cumulative effects of large signs.

Regarding including visual simulations in the DEIR, as described in DEIR subsection 1.4 on page 1.0-2, the DEIR is a programmatic EIR that is intended to provide a broad analysis of the proposed countywide sign standards which apply to many different sign types and locations. Because the Sign Ordinance does not approve any specific signs, it would be speculative for County staff or the environmental consultant to attempt to determine the future location, size, and type of sign that could be proposed in the future. Because of the possible variables with respect to sign location, size, and design, a conceptual simulation based on staff or consultant assumptions could provide a misleading representation of the severity of potential impacts, whether the impact is overstated or understated. Therefore, consistent with CEQA Guidelines Section 15145, further discussion of the speculative nature of visual simulations is not included. The commenter is referred to the illustrative diagrams provided in the Sign Ordinance for visual clarifications of the proposed sign standards.

Regarding 60-foot-high signs in Cameron Park, the proposed ordinance Section 17.16.070(F) allows freeway-oriented signs but limits their spacing to every 1,000 feet. These signs would also be limited to integrated developments or single tenets on a site that is 10 acres or more. Further, proposed Section 17.16.090 prohibits off-site commercial signs, except for directional and
agricultural signs in rural areas. Therefore, because the ordinance limits the number and location of these types of signs, the number of these types of signs would be limited and the conditions described in the comment would not occur. The commenter is referred to DEIR Impact 3.1.5 on page 3.1-11 for an analysis of the project’s potential contribution to cumulative impacts on visual resources.

Response A-4:

The commenter is unaware of any studies which validate the need and/or effectiveness of large multi-tenant identification signs such as those that would be permitted under the proposed Sign Ordinance. The commenter further claims that most urban cities do not permit signs up to 60 feet high.

As described in DEIR subsection 1.2, the purpose of the DEIR is to evaluate the environmental effects of the project as proposed, not to evaluate the need for the project or any of its components. It should be noted that Rancho Cordova also permits freestanding signs along Highway 50 with a maximum height of 60 feet (City of Rancho Cordova 2015).

The comment does not address the adequacy of the environmental analysis, and no further response is required. The comment is forwarded to the decision-makers for their consideration.

Response A-5:

The commenter summarizes the approval process for US Highway 50–oriented signs under the proposed Sign Ordinance. The commenter states that the approval process would be considered a ministerial decision and therefore would not require further, project-specific environmental review.

DEIR Section 3.1, Aesthetics, provides an analysis of the potential environmental impacts of future signs under the proposed Sign Ordinance update. The DEIR concludes that conformance with the proposed sign standards would minimize impacts on visual resources and does not rely on future review to further reduce potential impacts.

Response A-6:

The commenter states that the Cameron Park and Shingle Springs areas currently experience sign clutter and that additional signs under the proposed Sign Ordinance update could exacerbate this existing condition. The commenter further states that visual simulations of potential future signs in these areas are necessary to determine the resulting visual impacts and would likely show an adverse effect. The commenter provides photographs of existing tall signs in the county and states that they are unnecessarily high for adequate identification.

The comment refers to the existing conditions in the community of Cameron Park. While the DEIR considers the existing conditions in the county for the analysis in the DEIR, the existing conditions are not a result of the project. It is assumed that existing businesses already have signs and any new signs would be required to comply with the new ordinance, which may include removal of existing signs in order to comply with the requirements in the proposed Sign Ordinance based on the frontage or area specific to the business. It should also be noted that signage associated with commercial uses in an area that is designated for commercial use would not be considered incompatible with the visual character. The commenter is also referred to Responses A-3 and A-5.
Response A-7:

The commenter states that the issuance of a Design Review Permit for US Highway 50-oriented signs would be a ministerial decision and would therefore not be subject to further, project-level environmental analysis.

The commenter is referred to Response A-5.

Response A-8:

The commenter states that the use of State of California motorist information signs to provide information regarding food, fuel, and lodging should be considered as a project alternative.

The comment does not refer to the potential impact for which such an alternative would reduce impacts. The commenter is referred to Response A-2. The comment is forwarded to the decision-makers for their consideration.

Response A-9:

The commenter states that the project would amend the El Dorado County General Plan to relocate billboards out of designated scenic corridors and the proposed Sign Ordinance provides a reduced maximum height for signs within such corridors. The commenter states that visual simulations of the conditions with and without these regulations would aid decision-makers.

Because no specific sign is proposed by the project, preparation of visual simulations would require speculation on the part of County staff or the consultant. The commenter is referred to Response A-3.

Response A-10:

The commenter states that a segment of Highway 50 west of Placerville is under consideration for designation as a scenic highway; however, the presence of billboards could jeopardize its designation. The commenter further states that the proposed Sign Ordinance should protect all segments of Highway 50 from visual impacts, not just those officially designated as scenic highways. The commenter disagrees with the conclusion of DEIR Impact 3.1.2.

Table 3.1-1 includes a list of scenic areas and viewpoints in the county that were considered in the analysis in the DEIR. Given the developed nature of the Cameron Park area to which the commenter refers, the DEIR does not consider signage associated with businesses in the area to be visually incompatible with the area. The commenter's opinion on visual quality is noted and forwarded to the decision-makers for their consideration.

Response A-11:

The commenter states that the maximum 20-foot-high pole signs that would be permitted on local streets under the proposed Sign Ordinance update could result in an adverse visual impact and a safety hazard by distracting motorists. The commenter states that the DEIR should provide a visual simulation of the implementation of this standard. The commenter provides photographs of existing pole-mounted signs in the county.

Potential project impacts to visual resources are evaluated in DEIR Section 3.1, Aesthetics. The commenter is referred to Response A-3.
Letter B

Cameron Park Community Services District

February 17, 2015

Anne Novotny, Senior Planner
El Dorado County Community Development Agency
Long Range Planning,
2850 Fairlane Court, Building C
Placerville, CA 95667

Dear Anne Novotny,

Comments related to the draft sign ordinance:

1) Attached to this letter is a copy of our comments that were submitted on October 14, 2014. We still feel that there needs to be more definitive specific location language included in Section 17.16.030; especially as it relates to election signs (B-10b).

2) We support the language contained in Section 17.16.060. As indicated in our previous comments, there are six public relations signs (two at Hacienda Park, three at Christa McAuliffe Park (two dual facing and one single facing) and one at David West Park) that the Cameron Park Community Services District has grandfathered in to the Sign Ordinance. The design and detailed descriptions were submitted to the County Building Department in November, 2013. These signs have been in use by the CPCSD for many years advertising civic and community events.

3) Under Section 17.16.070, E-4b; setback and spacing of freestanding signs. The spacing of CPCSD existing signs at Christa McAuliffe Park are restricted to 450 feet due to property size. The remainder of the park is in a bowl shape which is also in a large PG&E easement which makes it impossible for signage and we are requesting an exemption for these existing signs.

We are also forwarding copies of comments submitted by the Cameron Park Design Review Committee. We have reviewed these comments and feel that they should be given strong consideration for adjustments to the existing sign ordinance.

We will be submitting additional comments, if needed, prior to the Board of Supervisors adoption of the updated Sign Ordinance. Once again, thank you for giving us this opportunity and feel free to contact me if you have any questions.

Sincerely,

Mary Cahill
General Manager

Attachments: As Stated Above
November 1, 2014

Ms. Anne Novotny, Senior Planner
County of El Dorado
Community Development Agency
Long Range Planning Division
2850 Fairlane Court
Placerville, CA 95667

Dear Ms. Novotny:

Below are our comments on the draft Sign Ordinance Update.

1) 17.16.030 – B: More definition is needed regarding political signs, such as, location, freeway, empty lots, government buildings, Department of Transportation (DOT) right-of-way, etc.

2) 17.16.080; There are six public relation signs (two at Hacienda Park, three at Christa McAuliffe Park and one at David West Park) that the Cameron Park Community Services District (CPCSD) has grandfathered in to this Sign Ordinance. The design and detailed descriptions were given to County Building Department in November 2013. These signs have been in use by the CPCSD for many years advertising civic and community events.
   - Regarding signage on landscape corridors, is there any intended regulation regarding commercial, political, or real estate signs in landscape corridors?
   - Thank you for recognizing that some communities require more than one identity sign for multiple points of entry.

3) 17.16.070 – E – 4. – b.; The CPCSD existing signs at Christa McAuliffe Park are restricted to 450’ due to property size. The remainder of the park is in a bowl which is also in a large PG&E easement which makes it impossible for signage and may require an exemption for existing signs.

Please also consider the enclosed comments from our Design Review Committee.

These are initial comments and I will submit additional comments if needed. Thank you for giving us this opportunity and feel free to contact me if you have any questions.

Sincerely,

Mary Cahill
General Manager

Enclosure
cc: Paul Ryan, Park Superintendent
2502 Country Club Drive
Cameron Park, CA 95682
(530) 677-2231 / (530) 677-2201 (f)
Letter B Continued

DESIGN REVIEW COMMITTEE
COMMENTS ON COUNTY SIGN ORDINANCE

The environmental document should focus on visual examples of what the County would look like if signs were to be installed in accordance with the proposed County sign ordinance.

There should be a "Purpose" section. The "Content" section should be renamed "Purpose."

1. The "Content" section would to the extent allowable by law eliminate billboards along "identified scenic and historic routes." This paragraph refers to "objective 2.7.1, but it does not indicate that this is an objective of the County General Plan.

Cameron Park is not located in an identified scenic and historic route, but the goal of the sign ordinance should be to eliminate the billboards in Cameron Park or actually the entire County. They mostly advertise goods and locations that are not helpful to the local economy (beer, Thunder Valley Casino, etc.) Objective 2.7.1 Objective 2.7.1: SIGNS REGULATION, Regulation of the location, number and size of highway signs and elimination of billboards along identified scenic and historic routes. Policy 2.7.1.1 The Sign Ordinance shall include design review for signs within the foreground and background of the designated scenic corridors commensurate with the goal of scenic corridor viewed protection.

2. Under the "Applicability" Section, subsection E, states "Protect viewsheds in designated scenic corridor." Because billboards are inherently unattractive and constitute a visual blight and contribute something positive to the character of El Dorado County, they should not be allowed anywhere and more specifically in Cameron Park.

3. Under "General Sign Requirements" subsection A, refers to complying with "other private agreements that provide more restrictive sign regulations than are required by this chapter. Reference should be made to complying with community-based, officially adopted sign guidelines.

Under subsection G, there is an indication that exceptions from sign standards require a variance. However, those businesses pursuing signs are typically just starting out and the costs and time associated with the variance process are too restrictive and not practical. Come up with another process, such as "Sign Exceptions" (or other wording) which can be approved by the Planning Director when certain criteria are met.

4. Under "Exemptions," subsection 6, there should be a maximum area for street addresses and oversized addresses can be used as an advertisement in themselves. Under subsection 10, vehicles with signs on them should also be registered, operable, should not be stationary (not parked in a field and serve as a huge sign.)

5. Under "Exempt Signs With Limitations," subsection 3 relating to flags, there should be a limitation on the number of flags. There should be an indication that when a flag is used as a sign to identify a business, the flag must count toward the number and area of allowable signage.
Under subsection 8, real estate signs cannot be placed in the public right-of-way, but this is not very practical given the rural character of the area.

Subsection 12, sub-subsection a, refers to temporary signs and indicates that temporary signs should not project above the roof line. They should be prohibited from being on the roof at all.

Under “Permanent Signs, subsection 4, indicates where permanent signs are permitted. Sub-subsection 4 would indicate that permanent signs are allowed only outside designated scenic corridors. The reader would incorrectly conclude that permanent signs are not allowed in the scenic corridor at all if within 100 feet of Highway 50.

Under “Sign Development and Design Standards,” subsection C, “Sign Height Measurement,” the height should be measured from the sidewalk or street grade given the topography of the area. One sign might sit on the high side of the street and another on the down-hill side of the street where visibility is equally important. Signs should not be placed on landscaped mounds to achieve greater height. Signs are viewed by motorists and pedestrians, so measuring the height from the sidewalk or road grade is ideal.

Under “Sign Development and Design Standards,” subsection C, sub-subsection 4.b, relates to minimum spacing distance between permanent freestanding signs. Highway 50 signs are to be separated by 1000 feet. Did County staff determine how that might look in Cameron Park or how that could result in many signs already existing being rendered nonconforming? If nonconforming, which sign should be removed first? The environmental analysis should include visual depictions of what this might look like. This section goes further to say that approving authority may allow a reduction in spacing to ensure that a qualified (whatever that is) business can have at least one freestanding sign. If this is the case, then the separation requirement does not hold any water and most signs in Cameron Park and along Highway 50 would be much less than 1000 feet apart. Would a variance be required?

Under “Sign Development and Design Standards,” subsection F relates to maintenance and indicates that violations could be considered a nuisance and a zoning violation and would be enforced as such. There should be different enforcement procedures for signs. For example, temporary signs in the public right of way that cause a nuisance should not be allowed to wait until a court date or given a couple of weeks to comply. There should be a provision for County staff removing dangerously placed signs.

Under “Sign Development and Design Standards,” subsection H, “Design Standards for Specific Sign Types,” raceway signs should not be allowed as individual letters (push pin signs) are much more attractive. Also, canned signs should not be permitted.

Under “Sign Development and Design Standards,” subsection J, “Standards for U.S. Highway 50-Oriented Signs, design review by the Planning Commission is required. However, these signs should not be taken for granted and a use permit should be required. Further, under subsection J, sub-subsection 4 relates to height. Although maximums are indicated, there should be proof that the maximum height is necessary for adequate visibility and not just be taken for granted. A much lesser height may be...
3.0 COMMENTS AND RESPONSES

Letter B Continued

adequate and more readily and safety seen by motorists. The sign should be within a motorist’s line of sight and no higher.

TABLES

The tables make reference to “public” streets, yet many of the County’s streets are private.

Monument signs should not exceed 6 feet high. This height is within the line of sight of motorists. County communities are small and speed-limits are relatively low so that large, tall signs are unnecessary and unnecessarily intrusive.

It should be clear that when there are multi-tenant buildings or campus-type developments each tenant should not be allowed a free-standing sign. One sign for most developments, with space on the sign for each tenant is adequate. This is especially true in an industrial area where the general public is generally not looking for a specific location. Once a truck driver finds an industrial business, they need to find it only the first time.

Within the AE-PA zone the maximum height is 6 feet above the roofline. There is no such thing as an attractive roof line and all roof signs should be prohibited in every zoning district.

Under “Permit requirements and Review Procedures,” it should be made clear that sign design and location should be a part of any proposed development, especially commercial development. It should be shown how the sign will relate to the architecture of the building, where on the building a sign may be situated, where within the proposed landscaping a sign would be located, and how a sign will not interfere with proposed landscaping, such as trees and shrubs, and with proposed light standards.

Landscaping should be designed to ground a sign by providing an attractive and colorful base around the sign. Atractive signs are not afterthoughts. Signs should not overlap architectural features, including windows or other decorative elements, or hang off an eave.

Under “Prohibited Signs,” subsection b, sub-subsection 3, provides for roof signs in rural areas. All roof signs should be prohibited. (What defines a “rural” area?)

Under “Prohibited Signs,” subsection b, sub-subsection 12, and subsection C, “nonconforming signs,” refer to a “person installing the sign.” This language is likely non-enforceable in that the “person” may no longer be available or his/her whereabouts may not be known, and a sign company rather than an individual may be responsible for the sign. Re-write this section.
3.0 COMMENTS AND RESPONSES

Letter B Continued

CAMERON PARK SIGN ORDINANCE
ENVIRONMENTAL IMPACT REPORT (EIR)

COMMENTS

It appears that Cameron Park will be the community most impacted by the signs that would be allowed in the proposed El Dorado County Sign Ordinance. The Executive Summary of the draft EIR states,

_The County recognizes that signs are an essential element of a community's visual appearance and provide a means to identify and promote local establishments. Signs provide useful information to the public, but should not become visual distractions along public roadways._

More should be said other than that signs "should not become visual distractions along public roadways." There should also be a statement that signs should not be the source of visual blight, they should not be unsightly, they should not contribute to sign clutter, they should not detract from the natural element or the built environment, and they should be consistent with the officially adopted design guidelines for each El Dorado County community.

The Executive Summary indicates that the "no digital signs" alternative is the environmentally superior option; however, there was no alternative that considered eliminating or reducing the size of the proposed 80-foot-high Highway 50-oriented signs, which are likely to be the most visually offensive signs of all proposed signs.

The main environmental issue associated with sign is the visual aspect of them, i.e., their potential aesthetic impact on the environment. The Cameron Park Design Review Committee requested that the EIR display pictures of what the environment might look like should signs be permitted as proposed. For example, what would the visual impact be of 80-foot-high signs marching up Highway 50 in Cameron Park? That is as tall as an 8-story building. How can decision-makers possibly make an intelligent judgment about visual impacts unless there is a visual representation of what the environment might look like with signs as proposed? The Executive Summary states,

_This document is a programmatic EIR that is intended to provide a broad analysis of the proposed countywide sign standards which apply to many different sign types and locations. Therefore, descriptions and/or analysis of individual signs would not be appropriate and would be beyond the scope of this document._

The Design Review Committee recognizes that, as a programmatic document, the EIR does not address individual signs. However, from a cumulative standpoint, 80-foot high signs may be a significant impact on the environment, particularly in Cameron Park and Shingle Springs. Signs can contribute in a more positive way to community identity than what is proposed. The Committee is unaware of any visual analysis that was conducted that would have concluded that 80-high signs are necessary to adequate identification and that they would be an attractive addition to our communities. Pictures are necessary to determine visual impacts on the environment. There is already sign clutter in Cameron Park and Shingle Springs, and a visual representation of what could occur with adoption of the proposed sign ordinance that allows 80-foot-high signs will likely show that additional very tall signs will exacerbate this situation. The signs depicted below are less than 80 feet high, and they are unnecessarily high for adequate identification. The proposed Sign Ordinance indicates that Highway-50
Letter B Continued

oriented signs are to be a ministerial action, meaning that if they meet the height, area and setback requirements they cannot be denied. In effect, without a visual analysis of the impacts of these large signs, there is to be no further environmental review.

The State of California provides for small blue signs near freeway off-ramps which provide motorists with information regarding food, fuel and lodging. The use of these signs as a project alternative in the EIR would be appropriate.

The Executive Summary lists project objectives, including:

*Promote economically stable and visually attractive communities within the county.*
*Promote signs and graphics that are attractive, pleasing, and harmonized with the physical character of the structure and environment of surrounding properties.*
Letter B Continued

Protect views in designated scenic corridors.
Encourage individuality among communities and businesses through signage.

The Executive Summary also points out that the General Plan is proposed to be adopted that will allow billboards to be relocated to outside designated Scenic Corridors. Furthermore, signs along Highway 50 in the scenic corridor are proposed to be shorter than those outside the scenic corridor. A visual representation of what the difference is would help decision makers decide if this proposal is to be adopted.

A study is to be done to indicate if the scenic corridor can be extended to the west of Placerville. However, with the recent addition of offensive billboards in these areas that impede the views of the sierras and other natural features, it is dubious that Highway 50 in the vicinity of Cameron Park and Shingle Springs will be designated as a scenic corridor. But, what does that have to do with making sure that signs along all segments of Highway 50 are attractive? The notion that signs should be more sensitive to their surroundings and not impede the views of the natural environment ONLY IN THE DESIGNATED SCENIC CORRIDORS is offensive. A sign ordinance should require attractive signs that contribute in visually positive ways to all communities in El Dorado County and that do not impede attractive settings. The notion that attractive signs should be provided for along a scenic corridor and less attractive signs may be allowed elsewhere does not take advantage of this opportunity to improve the aesthetic quality of the entire county. The aesthetic impacts of this provision of the Sign Ordinance should not be considered "no impact" or "less than significant impact."

Cameron Park and Shingle Springs are already riddled with sign clutter, and to allow relocation of billboards to our area solely because it may be outside a designated scenic corridor would further denigrate our skyline and contribute to visual blight.

The proposed Sign Ordinance would allow 20-foot high pole signs on local streets. There should be a visual representation of the result of adopting such a provision. This representation would show that there could be an adverse visual impact, both aesthetically and as a distraction to motorists who would have to take their eyes off the road to view such signs. In addition, the 20-height would likely interfere with tree canopies, which often results in severely pruning trees to make the sign more visible or even removing the tree. A visual representation would reveal that a 6-10-foot sign would be more in the line of sight of motorists.

Additional comments from the Cameron Park Design Review Committee may be forthcoming.

Note line of sight of motorists and that the motorists would have to take eyes from the road to read the tallest sign. A picture is worthwhile for determining impacts on the environment.
Letter B Continued
LETTER B – MARY CAHILL, GENERAL MANAGER, CAMERON PARK COMMUNITY SERVICES DISTRICT

Response B-1:

The commenter provides numerous suggested revisions to the proposed Sign Ordinance update.

This is not a comment on the adequacy of the EIR, but a comment on the merits of the project. No response is required. The comment is forwarded to the decision-makers for their consideration.

Response B-2:

The commenter attached a letter sent from the Cameron Park Design Review Committee.

The comment is a duplicate of Letter A. The reader is referred to Responses A-1 through A-11.
Letter C

STATE OF CALIFORNIA
GOVERNOR’S OFFICE OF PLANNING AND RESEARCH
STATE CLEARINGHOUSE AND PLANNING UNIT

February 17, 2015

Anne Novotny
El Dorado County Community Development Agency
2850 Fairlane Court, Building C
Placerville, CA 95667

Subject: Sign Ordinance Update
SCH#: 2014102001

Dear Anne Novotny:

The State Clearinghouse submitted the above named Draft EIR to selected state agencies for review. The review period closed on February 13, 2015, and no state agencies submitted comments by that date. This letter acknowledges that you have complied with the State Clearinghouse review requirements for draft environmental documents, pursuant to the California Environmental Quality Act.

Please call the State Clearinghouse at (916) 445-0613 if you have any questions regarding the environmental review process. If you have a question about the above-named project, please refer to the ten-digit State Clearinghouse number when contacting this office.

Sincerely,

Scott Morgan
Director, State Clearinghouse

1400 10th Street  P.O. Box 3044  Sacramento, California  95812-3044
(916) 445-0613  FAX (916) 323-3018  www.opr.ca.gov
### Letter C Continued

**Document Details Report**

**State Clearinghouse Data Base**

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<th>SCH#</th>
<th>2014102001</th>
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<tbody>
<tr>
<td>Project Title</td>
<td>Sign Ordinance Update</td>
</tr>
<tr>
<td>Lead Agency</td>
<td>El Dorado County</td>
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**Type** EIR  Draft EIR

**Description**
The County of El Dorado is proposing a comprehensive update to the Sign Ordinance. The proposed project consists of the adoption and implementation of a comprehensive update to the County’s existing Sign Ordinance (Chapter 17.16 of the Zoning Ordinance) and amendment of General Plan Objective 2.7.1 and corresponding Policy 2.7.1.2 pertaining to billboards along identified scenic corridors and historic routes. The purpose of the Sign Ordinance update and General Plan Amendment (GPA) is to ensure signs are consistent with the visual and aesthetic goals and policies set by the El Dorado County General Plan and to protect the county’s visual appearance and scenic landscapes. The proposed project does not involve amendments to the County General Plan land use designations or zoning districts or any new entitlements.

**Lead Agency Contact**

<table>
<thead>
<tr>
<th>Name</th>
<th>Anne Novotny</th>
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<tbody>
<tr>
<td>Agency</td>
<td>El Dorado County Community Development Agency</td>
</tr>
<tr>
<td>Phone</td>
<td>530 621 5931</td>
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<tr>
<td>Email</td>
<td></td>
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<tr>
<td>Address</td>
<td>2850 Fairlane Court, Building C</td>
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<td>City</td>
<td>Placerville</td>
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**Project Location**

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**Cross Streets** Countywide

**Parcel No.** Township

**Proximity to:**
- Highways
- Airports
- Railways
- Waterways
- Schools
- Land Use Various; sign ordinance update would apply countywide.

**Project Issues** Aesthetic/Visual

<table>
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<th>Reviewing Agencies</th>
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<tbody>
<tr>
<td>Resources Agency; Department of Fish and Wildlife, Region 2; Office of Historic Preservation; Department of Parks and Recreation; Department of Water Resources; California Highway Patrol; Caltrans, District 3 S; Air Resources Board; Regional Water Quality Control Bd., Region 5 (Sacramento); Native American Heritage Commission; Public Utilities Commission</td>
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**Date Received** 12/31/2014  **Start of Review** 12/31/2014  **End of Review** 02/13/2015

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**Note:** Blanks in data fields result from insufficient information provided by lead agency.
LETTER C – SCOTT MORGAN, DIRECTOR, CALIFORNIA OFFICE OF PLANNING AND RESEARCH, STATE CLEARINGHOUSE

Response C-1:

The commenter notes no agencies submitted comments to the State Clearinghouse within the 45-day public review period.

The comment does not address any issues related to the adequacy of the DEIR. No response is required.
Letter 1
Anne Novotny <anne.novotny@edcogov.us>

(no subject)
1 message

Bob Caldwell <jc4@abcglobal.net>
To: anne.novotny@edcogov.us

Thu, Jan 15, 2015 at 2:49 PM

I wish to submit my thoughts on the proposed sign ordinance:
1. I object to cloth, plastic or any other flimsy material advertising a business or product hanging from the fence of a particular business.
2. I object to the same type of signs strung between trees, posts or other stationary items.
3. I object to the same type of signs hung from the sides or top of a building.
4. I object to large, obviously home-made signs which are eyesores and which most of the time blow over in the wind because they are not secured properly.

I am attaching some pictures I took in the downtown area of Shingle Springs although there are many similar in the greater area.

Bob Caldwell

This email has been checked for viruses by Avast antivirus software.
http://www.avast.com

5 attachments

101K

138K

https://mail.google.com/mail/u/2?ui=2&ik=41950ad1e1&view=pt&search=l&l=14aefb20ed8095a&sid=14aefb20ed8095a
Letter 1 Continued
Letter 1 Continued

Emailing: IMG_2022-2
1 message

Bob Caldwell <rcj04@sbcglobal.net>  Thu, Jan 15, 2015 at 3:14 PM
To: anne.novotny@edcgov.us

Sorry. Meant to send this also.
Bob Caldwell

This email has been checked for viruses by Avast antivirus software.
http://www.avast.com

IMG_2022-2.jpg
140K
LETTER 1 – BOB CALDWELL, RESIDENT

Response 1-1:

The commenter states his objections to several specific types of signs.

The comment does not address the adequacy of the environmental analysis. The commenter is referred to Section 17.16.90, Prohibited Signs, of the proposed Sign Ordinance, which generally prohibits signs composed of paper, cloth, or other flexible material.
January 15, 2015

Ms. Anne Novotny
El Dorado Co. Community Development Agency
Long Range Planning
2850 Fairlane Court, Building C
Placerville, CA 95667

Re: Comments regarding DEIR for El Dorado County Sign Ordinance Update Project
(SCH 2014102001)

Dear Ms. Novotny,

Thank you for sending the notice of availability of the DEIR for the sign ordinance update and General Plan amendment project. The opportunity to enter comments into the record is very much appreciated.

I represent Stott Outdoor Advertising, which owns and operates several off-site advertising signs in unincorporated El Dorado County. All of Stott's signs will be subject to the updated sign ordinance. Please keep Stott on all mailing lists for future public hearings, and notices of any changes to General Plan policies and County regulations regarding off-site signs. If you are maintaining an e-mail notification list, please add my e-mail address to it which is as follows gredeker@stottoutdoor.com.

I have no objections or comments regarding the environmental analysis contained in the DEIR, however, there is a single comment I'd like to make regarding the General Plan amendment.

I'm encouraged by the proposed General Plan amendment, as the original language in the 2004 General Plan was inconsistent with Section 5412 of the Outdoor Advertising Act (copy enclosed), found in the California Business and Professions Code, Division 3, Chapter 2. Please ensure that the final General Plan language and policy regarding off-site signs is consistent with this provision of the State law, requiring either paid compensation or a relocation agreement in the case of compelled removal of a lawfully erected off-site advertising sign.

Thank you for your time and consideration.

Best regards,

[Signature]

Greg Redecker
Leasing Representative

GR: EM

Enclosure(s)
Letter 2 Continued

§ 5412 BUSINESS AND PROFESSIONS CODE

that this section shall not apply to advertising displays adjacent to a landscaped freeway.

§ 5412. Displays; removal or limitation of use; compensation; application of section; relocation

Notwithstanding any other provision of this chapter, no advertising display which was lawfully erected anywhere within this state shall be compelled to be removed, nor shall its customary maintenance or use be limited, whether or not the removal or limitation is pursuant to or because of this chapter or any other law, ordinance, or regulation of any governmental entity, without payment of compensation, as defined in the Eminent Domain Law (Title 7 (commencing with Section 1230.010) of Part 3 of the Code of Civil Procedure), except as provided in Sections 5412.1, 5412.2, and 5412.3. The compensation shall be paid to the owner or owners of the advertising display and the owner or owners of the land upon which the display is located.

This section applies to all displays which were lawfully erected in compliance with state laws and local ordinances in effect when the displays were erected if the displays were in existence on November 6, 1978, or lawfully erected after November 6, 1978, regardless of whether the displays have become nonconforming or have been provided an amortization period. This section does not apply to on-premise displays as specified in Section 5272 or to displays which are relocated by mutual agreement between the display owner and the local entity.

"Relocation," as used in this section, includes removal of a display and construction of a new display to substitute for the display removed.

It is a policy of this state to encourage local entities and display owners to enter into relocation agreements which allow local entities to continue development in a planned manner without expenditure of public funds while allowing the continued maintenance of private investment and a medium of public communication. Cities, counties, cities and counties, and all other local entities are specifically empowered to enter into relocation agreements on whatever terms are agreeable to the display owner and the city, county, city and county, or other local entity, and to adopt ordinances or resolutions providing for relocation of displays.

§ 5412.1 Removal without compensation; displays on residential zoned property; requirements; adjustments

A city, county, or city and county, whose ordinances or regulations are otherwise in full compliance with Section 5412, is not in violation of that section if the entity elects to require the removal without compensation of any display which meets all the following requirements:

(a) The display is located within an area shown as residential on a local general
LETTER 2 – GREG REDEKER, STOTT OUTDOOR ADVERTISING

Response 2-1:

The commenter has no comments on the environmental analysis contained in the DEIR. The commenter requests that the County ensure that the proposed Sign Ordinance is consistent with California Business and Professions Code, Division 3, Chapter 2, which contains the Outdoor Advertising Act, and provides a copy of the referenced code section.

The comment is forwarded to the decision-makers for their consideration.
3.0-32

3.0 COMMENTS AND RESPONSES

Letter 3
COMMUNITY DEVELOPMENT AGENCY
LONG RANGE PLANNING

2850 Fairlane Court, Placerville, CA 95667
Phone (530) 621-4650, Fax (530) 642-0508

January 29, 2015

Sign Ordinance Update Draft EIR Meeting Comment Form

Please provide your comments on the Sign Ordinance Update Draft EIR. Comments should focus on the sufficiency of the Draft EIR in identifying and analyzing the possible impacts on the environment and ways in which potential significant effects of the project might be avoided or mitigated. Comments are most helpful when they suggest specific alternatives or mitigation measures that would provide better ways to avoid or mitigate potential significant environmental effects. You can provide this form with your written comments to staff at this meeting or mail or email your comments, prior to 5:00 p.m. on Tuesday, February 17, 2015, to:

Anne Novotny, Senior Planner
El Dorado County Community Development Agency, Long Range Planning
2850 Fairlane Court, Placerville, CA 95667
Email: anne.novotny@edcegov.us Fax: (530) 642-0508

Name: Eric Dziobek
Address: 3860 Oxford Road Cameron Park

Comments:

• The Draft EIR does not go far enough to consider the visual impacts of visual blight.
• The Draft EIR does not consider the fact that regional neighbors do not allow tall (greater than 8') & do not contribute to visual blight.
• Densities allowed for on-site freestanding signs & contribute to blight.
• The EIR does not consider other scenic roadways/hills such as Hwy 49.
• The EIR does consider cumulative effects of lighting but does not consider the cumulative effects of freestanding tall signs.

3-1
3-2
3-3
3-4
3-5
LETTER 3 – ERIC DRIEVER, RESIDENT, CAMERON PARK

Response 3-1:

The commenter states that the DEIR does not adequately consider impacts of visual blight.

DEIR Section 3.1, Aesthetics, addresses the potential for visual effects in the county. With regard to blight, El Dorado County Code Section 9.02.040 defines visual blight as “any deteriorated, unreasonable or unlawful condition or use of premises, which by reason of its appearance is detrimental to the property of others and detracts from the general standards of the neighborhood or the community; or which would be viewed by a person of reasonable sensibilities as offensive.” Signs are a lawful use in commercial and industrial areas and would not be considered blight. Further, Section 17.161.090(A)(13), Prohibited Signs, expressly prohibits signs that are “dilapidated, abandoned, or in disrepair or dangerous condition.” This would ensure that any signs would not result in blight.

Response 3-2:

The commenter states that the DEIR does not consider the sign height standards of neighboring jurisdictions and that the smaller signs in these jurisdictions do not contribute to visual blight.

The proposed Sign Ordinance was developed to address the specific needs of El Dorado County. The sign standards of neighboring jurisdictions are not relevant to the analysis in the DEIR. The commenter is also referred to Response 3-1 regarding visual blight.

Response 3-3:

The comment states “densities allowed for onsite freestanding signs contribute to blight.”

The proposed standards for freestanding signs are summarized in Table 17.16.070.2a of the proposed Sign Ordinance. As discussed in Response 3-1, “blight” refers to physical deterioration, not to visual effects. DEIR Section 3.1, Aesthetics, addresses the potential for visual effects in the county.

Response 3-4:

The commenter states that the DEIR does not consider scenic roadways or highways other than Highway 50, such as Highway 49.

No segments of Highway 49 within the county are officially designated as a scenic highway at either the state or county level (Caltrans 2013). Table 3.1-1 includes a list of scenic areas and viewpoints in the county that were considered in the analysis in the DEIR.

Response 3-5:

The commenter states that the DEIR does not address potential cumulative effects of freestanding signs allowed under the proposed Sign Ordinance update.

The commenter is referred to DEIR Impacts 3.1.1 through 3.1.4. The DEIR concludes that implementation of the proposed project, including implementation of standards for freestanding signs, would be less than significant. Therefore, the project’s contribution to cumulative visual impacts was determined to be less than cumulatively considerable. The commenter is also referred to Response A-3 regarding tall signs.
Letter 4

4520 Lon Court
Diamond Springs, CA 95619
January 29, 2015

DAVID DEFANTI, Assistant Director Community Development Agency
Long Range Planning
2850 Fairlane Court, Placerville, CA 95667

Subject: Sign Ordinance Update

Dear David:

I had the following letter published in the Mountain Democrat 2/1/12:

“I am very worried one of my favorite scenic views in El Dorado County may be damaged. I do not enjoy cities; I love our “rural” county. For me, our rural county begins when I see the Crystal Range framed by the Ponderosa Road overcrossing on Highway 50. My favorite viewing time is when the snow fields on top of the Sierra are painted pink by the setting sun. I am very concerned the three lighted road signs proposed in Shingle Springs will seriously damage my version of an Ansel Adams picture. The Planning Commission will be discussing this issue February 9th.”

Unfortunately, my concerns were not addressed and they can now be vividly seen on the landscape. I am someone who generally believes we are over-regulating ourselves, and we have damaged our business climate as a consequence. This sad episode about these billboards must not be repeated, but let’s be careful to not overreact to the irresponsible actions of the few. Please work hard to not reward those who obviously do not really care about the public desire.

Sincerely,

Robert A. Smart, Jr.

cc: Supervisor Brian Veerkamp
cc: Supervisor Mike Ranalli
LETTER 4 – ROBERT A. SMART, JR., RESIDENT, DIAMOND SPRINGS

Response 4-1:

The commenter quotes a letter, submitted to the Mountain Democrat newspaper in February 2012, describing scenic views in the county and objecting to three proposed lighted road signs in Shingle Springs.

The perceived impacts of signs installed in the county prior to the initiation of the proposed Sign Ordinance update are part of the existing conditions in the county and are not a result of the proposed project. The comment does not address the adequacy of the environmental analysis, and a response is not required. The comment is forwarded to the decision-makers for their consideration.
FW: Comment for sign ordinance

From: rsmart41@comcast.net [mailto:rsmart41@comcast.net]
Sent: Friday, January 30, 2015 10:39 AM
To: D-3, Brian; Ranalli, Mike
Cc: Defanti, David
Subject: Comment for sign ordinance

Brian and Mike, I turned the attached letter in to long range planning last night. The sign framed by the Ponderosa Rd. overcrossing is a blight on one of our most important landscapes, our Sierras. The decision for this sign will continue as long as it exists. There is no way to “get used to it” because it will frequently be changed. The displeasure with the sign is one of the few areas where most residents agree.

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Thank you.

[Attachment: Sign Ordinance 1-29-15.docx]

14K
Letter 5 Continued

4520 Lon Court
Diamond Springs, CA 95619
January 29, 2015

DAVID DEFANTI, Assistant Director Community Development Agency
Long Range Planning
2850 Fairlane Court, Placerville, CA 95667

Subject: Sign Ordinance Update

Dear David:

I had the following letter published in the Mountain Democrat 2/1/12:

“I am very worried one of my favorite scenic views in El Dorado County may be damaged. I do not enjoy cities; I love our “rural” county. For me, our rural county begins when I see the Crystal Range framed by the Ponderosa Road overcrossing on Highway 50. My favorite viewing time is when the snow fields on top of the Sierra are painted pink by the setting sun. I am very concerned the three lighted road signs proposed in Shingle Springs will seriously damage my version of an Ancil Adams picture. The Planning Commission will be discussing this issue February 9”.

Unfortunately, my concerns were not addressed and they can now be vividly seen on the landscape. I am someone who generally believes we are over-regulating ourselves, and we have damaged our business climate as a consequence. This sad episode about these bill boards must not be repeated, but let’s be careful to not overreact to the irresponsible actions of the few. Please work hard to not reward those who obviously do not really care about the public desire.

Sincerely,

Robert A. Smart, Jr.

cc: Supervisor Brian Veerkamp
cc: Supervisor Mike Ranalli
3.0 COMMENTS AND RESPONSES

LETTER 5 – ROBERT A. SMART, JR., RESIDENT, DIAMOND SPRINGS

Response 5-1:

The commenter references Letter 4 also submitted by the commenter. The commenter states that an existing sign at the Ponderosa Road overcrossing is a blight on the area's scenic views.

The commenter is referred to Response 4-1. The sign referenced in the original letter is part of the existing conditions in the county and not a result of the proposed project. Also refer to Comment 3-1 regarding visual blight. The comment is forwarded to the decision-makers for their consideration.
Hi Anna,

We spoke briefly last night during the comments on the DEIR meeting.

At one point you mentioned that there was a code for “Message Board” AKA flash billboards being considered for approval. Would you please inform me as to when that will be heard and considered for approval. I don’t remember if you said that would go in front of the Planning Commission or by whom.

Thanks much,

Gary Miles
LETTER 6 – GARY MILES, RESIDENT, EL DORADO

Response 6-1:

The commenter requests clarification on the County’s proposed regulations for message boards and the associated approval process.

The commenter is referred to Section 17.16.070(H)(3) regarding digital signs. The comment does not address the adequacy of the environmental analysis, and a response is not required.
Re: Anne Novotny (Out of Office) Re: DEIR

1 message

gary <wave dude@earthlink.net> Tue, Feb 3, 2015 at 9:50 AM
Reply-To: gary <wave dude@earthlink.net>
To: Anne Novotny <anne.novotny@edcgov.us>

Anne:

Sorry to bug you but at the DEIR meeting last Thursday it was mentioned that all new billboards will not be approved. But you mentioned that there is a code coming up to be approved on allowing Massage or Digital Boards. I am a little confused as to why that is even going to be considered when all new billboards are not allowed any longer.

Please straighten up my mind, thanks

Gary Miles

---- Original Message ----
From: Anne Novotny
Sent: Jan 30, 2015 9:55 AM
To: wave dude@earthlink.net
Subject: Anne Novotny (Out of Office) Re: DEIR

I will be out of the office this Friday which is my regular day off. I work a 9/50 alternative schedule. If your email requires a response from me, I will reply when I am back in the office on Monday. If you need immediate assistance, please call Cindy Johnson at (530) 521-4650.

--
Anne Novotny
Senior Planner
County of El Dorado
Community Development Agency
Long Range Planning Division
2850 Fairlane Court
Placerville, CA 95667
(530) 521-5631 / (530) 642-0508
anne.novotny@edcgov.us

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Letter 7 Continued

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LETTER 7 – GARY MILES, RESIDENT, EL DORADO

Response 7-1:

The commenter requests further clarification on the County’s proposed regulations for digital signs.

The comment appears to equate digital signs and billboards. While the proposed Sign Ordinance would allow new digital signs, new billboards (whether digital or conventionally illuminated) would not be allowed under the proposed ordinance.
3.0 COMMENTS AND RESPONSES

Letter 8

Anne Novotny <anne.novotny@edg.gov>

Comments on Draft Sign Ordinance--February 17, 2015
1 message

Langley, Cheryl@CDPR <Cheryl.Langley@cdpr.ca.gov>  
To: "anne.novotny@edg.gov" <anne.novotny@edg.gov>  

Tue, Feb 17, 2015 at 10:00 AM

Hi Anne—

I've attached my comments on the draft EIR for the Sign Ordinance (first file). The remaining five (5) files are supporting documentation for my submittal.

I will deliver a hardcopy version of my comments/references to the County this morning.

Thank you for the opportunity to comment on this project proposal—it is greatly appreciated.

Cheryl Langley

6 attachments

dEIR SignOrdinance,February.17,2015.pdf  
1039K

Attachment 1. Lights Out.pdf  
241K

Attachment 2. Streetlights & Bats.pdf  
22K

91K

1007K

1131K
Letter 8 Continued

Cheryl Langley
5010 Mother Lode Drive
Shingle Springs, CA

Anne Novotny, Senior Planner
El Dorado County Community Development Agency
Long Range Planning
2850 Fairlane Court, Placerville, CA 95667
Email: anne.novotny@edcgov.us

February 17, 2015

Subject: Draft Environmental Impact Report for the Proposed Sign Ordinance; File#: 13-0086; OR12-0001

Ms. Novotny:

Thank you for the opportunity to comment on the draft Environmental Impact Report (dEIR) for the proposed sign ordinance. Please include my comments in the public record.

Ordinance Comparison: Existing and Proposed Ordinances

After reviewing the existing (December, 2009) and proposed sign ordinances, I compiled the following table in an attempt to understand specific differences between the two ordinances.

Table 1. Signs by type allowed under existing and proposed ordinance.

<table>
<thead>
<tr>
<th>Sign Type</th>
<th>Existing Ordinance Allows</th>
<th>Proposed Ordinance Allows</th>
</tr>
</thead>
<tbody>
<tr>
<td>Billboard, stationary</td>
<td>1 No</td>
<td>2 Yes—considered nonconforming and protected from removal by State law. County will consider amendment to the General Plan Objective and Policy that would allow elimination or relocation within existing designated scenic highway corridors (DShC) in accordance with state and federal law; no implementing ordinance language accompanies this language. Historic routes are mentioned only in amendment to General Plan Objective; it is likely they are not (and may never be) protected under this proposed ordinance. 17.16.070(I)(7) This section contains Special Development and Design Standards for DShC (Reserved for future Scenic Corridor Ordinance) But... 17.16.070(I)(4)(a) &amp; (b) establishes maximum height design standards for signs along DSHCs for multi- and single-tenant signs: 24 and 48 ft., respectively</td>
</tr>
</tbody>
</table>
## Letter 8 Continued

<table>
<thead>
<tr>
<th>Sign Type</th>
<th>Existing Ordinance Allows</th>
<th>Proposed Ordinance Allows</th>
</tr>
</thead>
<tbody>
<tr>
<td>Billboard, mobile</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>On right-of-way</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Billboard, mobile</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>On private property</td>
<td></td>
<td>Proposal is to “limit displays” only, not prohibit</td>
</tr>
<tr>
<td>Highway 50 Oriented Signs</td>
<td>No</td>
<td>Yes (ORP)</td>
</tr>
<tr>
<td>Pylon (60 sq.ft.)</td>
<td></td>
<td>May be lighted or digital</td>
</tr>
<tr>
<td>(Setback: 10 feet from Highway 50)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Digital Signs</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>Signs with blinking, flashing, or intermittent lights</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Moving Signs (General)</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>Moving Signs Signs Held by People</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>(non-commercial message)</td>
<td></td>
<td>(6 to 50 sq.ft.)</td>
</tr>
<tr>
<td>Moving Signs Signs Held by People</td>
<td>No</td>
<td>?</td>
</tr>
<tr>
<td>(commercial message)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Home Occupation Signs</td>
<td>Yes (6 sq.ft.)</td>
<td>Wall sign only for:</td>
</tr>
<tr>
<td></td>
<td></td>
<td>R1,R1A,R-20,000, RM</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1 wall sign 1 sq. ft.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Wall sign &amp; freestanding for: R2A,R3A,RE-5,RE-10</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Agriculture &amp; Resource Zones</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2 freestanding 12 sq. ft.</td>
</tr>
<tr>
<td>Permanent Signs (on-site)</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>(commercial message)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Permanent Signs (off-site)</td>
<td>Yes, can be established under a Special Use Permit (SUP)</td>
<td>Yes; permanent or temporary on private property in rural areas by right (without SUP)</td>
</tr>
<tr>
<td>(commercial message)</td>
<td></td>
<td>16 sq ft.</td>
</tr>
<tr>
<td>Temporary Signs (on-site)</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>(commercial message)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
3.0 COMMENTS AND RESPONSES

Letter 8 Continued

<table>
<thead>
<tr>
<th>Sign Type</th>
<th>Existing Ordinance Allows</th>
<th>Proposed Ordinance Allows</th>
</tr>
</thead>
<tbody>
<tr>
<td>Temporary Signs (off-site) (commercial message)</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Time Limits for Temporary Signs</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Signs affixed to Private Property</td>
<td>n/a</td>
<td>Yes</td>
</tr>
<tr>
<td>Subdivision Signs (off-site)</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>Construction Company Signs (off-site temporary)</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>Property (sale, lease, rental)</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Roof Signs</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>Wall Signs (including projecting signs)</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>“Building Attached” (Commercial)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Signs Painted on Walls</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Building Attached</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Window Signs</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Community Event</td>
<td>n/a</td>
<td>Yes</td>
</tr>
<tr>
<td>Community Identity</td>
<td>n/a</td>
<td>Yes</td>
</tr>
<tr>
<td>Community Directional</td>
<td>n/a</td>
<td>Yes</td>
</tr>
<tr>
<td>Industry Association (Farm Trails, etc.)</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Election/Campaign Signs</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Three-Dimensional Signs</td>
<td>Yes</td>
<td>?</td>
</tr>
<tr>
<td>A-Frame Signs</td>
<td>Outside right-of-way</td>
<td>Outside right-of-way</td>
</tr>
<tr>
<td>Gas Pricing Signs</td>
<td>n/a</td>
<td>Exempt from Limitations</td>
</tr>
<tr>
<td>Trespass, Hunting</td>
<td>Yes</td>
<td>Yes</td>
</tr>
</tbody>
</table>
# Letter 8 Continued

<table>
<thead>
<tr>
<th>Sign Type</th>
<th>Existing Ordinance Allows</th>
<th>Proposed Ordinance Allows</th>
</tr>
</thead>
<tbody>
<tr>
<td>Official Public Signs (parks, etc.)</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Signs Resembling Traffic Signs</td>
<td>No</td>
<td>Not in right-of-way;</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Private property posting allowed (48 hours; 6 sq.ft.)</td>
</tr>
<tr>
<td>Garage Sale</td>
<td>Not in right-of-way</td>
<td></td>
</tr>
<tr>
<td>Consolidation of Signs</td>
<td>No</td>
<td>9 &quot;Encouraged&quot;; only new multi-tenant shopping centers are subject to the Uniform Sign Program</td>
</tr>
<tr>
<td>Variance</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Non-Conforming Signs</td>
<td>Variance</td>
<td>Existing off-site signs (e.g., billboards) are considered nonconforming signs, but are protected from removal by applicable provisions of state law and may be removed only as allowed by state law. There are &quot;Legal Nonconforming Signs&quot;. Such signs can also be approved under a Variance</td>
</tr>
<tr>
<td>Unauthorized (Illegal) Signs in right-of-way</td>
<td>Immediate Removal</td>
<td>30 day grace period Appeal allowed</td>
</tr>
<tr>
<td>On trees, fence, utility poles</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Abandoned Signs</td>
<td>No</td>
<td>Yes—Blank copy: 90 days okay Can remain blank for 1 year In rural areas can remain blank for 2 years If sign can be used by subsequently by another business at site, not defined as abandoned.</td>
</tr>
<tr>
<td>Abatement Procedures</td>
<td>10 Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Penalties</td>
<td>11 Yes</td>
<td>11 Yes</td>
</tr>
</tbody>
</table>

For Table 1 footnotes 1-11, see Appendix A.

**Project Summary**

According to the dEIR (Section 2.1 Project Overview, page 2.0-1) the proposed sign ordinance update "...would generally be more restrictive than the existing ordinance, in that it provides standards with more specificity regarding sizing, location, and content." This is not the case. As can been seen in
Letter 8 Continued

Table 1—the side-by-side comparison of the current and proposed sign ordinance—the proposed ordinance actually expands allowable sign placement.1

- New signs will be allowed (and sign management will change) in the following instances:
  - Existing billboards along Highway 50 will likely not be removed—they are designated as "nonconforming" and removal is protected by applicable State law. The proposed ordinance applies to (limits) new billboards in designated scenic highway corridors.
  - It is likely historical routes will not be protected from sign placement.
  - Mobile billboards will most likely be allowed on private property, depending upon the message they present (e.g., mobile billboards are the industry standard for subdivision sales signs—such as those visible in the Scott Road area of Sacramento County).
  - Highway 50-oriented signs will be allowed.
  - Digital billboards will be allowed, unless the no digital billboard project alternative is chosen.
  - Moving signs will be allowed (including those held by people).
  - More and larger home occupation signs will be allowed.
  - The number of off-site commercial signs will likely increase; more permanent and temporary off-site signs will be allowed by right.
  - Subdivision sales signs will be allowed (either as stationary installations, or possibly as mobile billboard devices, as is the case in Sacramento County).
  - Construction company signs will be allowed at job sites.
  - Community identification, destination, and event signs will be allowed by right; it is likely additional signs will be placed.
  - Sign clutter consolidation is only "encouraged," not required; it is required only of new multi-tenant shopping centers. This measure does nothing to solve existing clutter.
  - Many of the provisions are not enforceable in practical terms (time limits for temporary signs, especially).
  - Unauthorized signs will be allowed to remain for 30 days, as opposed to being removed immediately.
  - Abandoned signs can remain in place for longer periods than previously allowed.
  - It is likely no penalties will be assessed for violations.

Summation:
- The proposed sign ordinance expands the number and kind of signs allowed in EDC.
- The existing sign ordinance is more protective of EDC aesthetics, when appropriately enforced. (The appropriate level of enforcement has been lacking.)
- The No Project Alternative is the "environmentally superior alternative."

Discussion

1) dEIR page 1.0-1: "In September 2012, the Board of Supervisors directed staff to proceed with a comprehensive amendment of the existing Sign Ordinance which had not been updated since 1980. The update would address key issues including: viewed protection (particularly within designated scenic corridors); removal and/or relocation of billboards/non-conforming signs; reduce sign clutter with sign consolidation; limit displays on parked mobile vehicles and/or trailers; fighting standards; and

2 Under CEQA, an accurate, stable and finite project description is sine qua non of informative and legally sufficient EIR. (Burbank-Glendale-Pasadena Airport Authority v. Hensler (1991) 233 Cal.App.3d 577.)
provisions for community identification, destination and event signs; electronic (digital) changeable message displays, signs in historic districts; on-site/off-site signs; exempt signs."

While the direction provided to staff sounds commendable, it actually misses the mark:

- The billboards that most residents are concerned about will not be removed (because they are not in designated scenic highway corridors and are designated “nonconforming,” and thus protected from removal by applicable State law.
- Sign clutter “consolidation” is only encouraged, not required, except in the case of new multi-tenant shopping centers; this does nothing to reduce sign clutter for existing commercial centers.
- Displays on mobile billboards will be eliminated from right-of-way locations, but most likely will not be eliminated from private property (“will limit displays”), and certain uses will likely remain depending upon the message displayed.
- Contains provisions for adding community identification, destination and event signs, digital billboards, signs in historic districts (according to paragraph cited above), on- and off-site signs and exempt signs.

2) The doIR downplays the scope and effectiveness of the current sign ordinance (page 1.0-1):
"The existing Sign Ordinance restricts signs from resembling traffic signs that would create a safety hazard, lightened signs that blink or cause objectionable glare, moving signs, and three-dimensional signs. Minor restrictions are also placed on the number of signs and where they may be located, such as in a public right-of-way or off premises."

- The fact is, the existing sign ordinance contains and a great deal of guidance for sign placement and many restrictions (see Appendix B). The ordinance includes not only the specific section “17.16 Signs” in the Zoning Ordinance (2009), but also specifies standards regarding size, location, and content under each of the specific zoning designations. It also references abatement and penalties for violations within the Zoning Ordinance (see Appendix B).

3) The doIR misleads the reader (and overstates the "value" of the proposed ordinance) when stating the following:
doIR, page 2.0-6, 2.3.4 Summary of Modifications to Existing Sign Ordinance
"Establishes regulations for abatement or removal of illegal, abandoned, and nonconforming signs as allowed by state law."

- The fact is, the existing sign ordinance contains (by reference) abatement procedures and penalties for violations. (See Appendix A, Items 10 & 11.)

4) doIR 3.0-1: “The analyses in this Draft EIR address the project’s short- and long-term adverse impacts on the physical (natural and built) environment. As discussed in Chapter 2.0, Project Description, the Sign Ordinance update is a policy document and does not directly construct new signs or modify any signs. Consequently, no direct physical impacts would be associated with the project. The project would update the existing Sign Ordinance requirements and restrictions for new signs and the conditions under which new signs can be

---

2 The proposed sign ordinance also lists some additional sign requirements under various zoning designations, but most specifications are included in Chapter 17.16 Signs (See Appendix C).
3 Under CEQA, an accurate, stable and finite project description is sine qua non of informative and legally sufficient EIR. (Burbank-Glendale-Pasadena Airport Authority v. Hensler (1991) 233 Cal.App.3d 577.)
Letter 8 Continued

3.0 COMMENTS AND RESPONSES

erected. The physical conditions in the county are the baseline against which the
significance of the project’s potential impacts is evaluated.”

- The contention that “no direct physical impacts would be associated with the project” is not
  supported by fact. The proposed ordinance is a planning document, and as such will have an
  impact on EDC aesthetics by establishing or revising standards for the
  construction/placement/duration of sign installations. In fact, its purpose includes:
  - To maintain and enhance the visual appearance of the County (Goal 2.7) (page 1)
  - Promote economically stable communities (page 2)
  - Protect view sheds in designated scenic corridors

To enhance, promote and protect implies policy impact; “direct physical impacts associated with
the project” are intended. It is inappropriate to evade responsibility for impacts that result from
policy adoption and implementation. And, because this proposed ordinance will in fact allow
the placement of signage not currently allowed, its impact is arguably negative, not
protective.

5) dEIR, page 1.0-2: “A comment was received requesting that the EIR provide photographs of existing
signs in the county that are permitted under the current Sign Ordinance as well as pictures of signs which
would be permitted under the proposed Sign Ordinance update. This document is a programmatic EIR
that is intended to provide a broad analysis of the proposed countywide sign standards which apply to
many different sign types and locations. Therefore, descriptions and/or analysis of individual signs
would not be appropriate and would be beyond the scope of this document. Furthermore, a small
sample of signs may not be representative of the overall proposed standards and it would not be
feasible to provide photographs of all sign types and locations.”

- It is the responsibility of the document preparers to convey information in a manner that is
  meaningful and descriptive to enable the public to effectively participate in the process. This
  type of project lends itself to the kind of “explanation” that is being requested, unlike most
  projects covered in EIRs. People want to know what the practical application of the ordinance
  will be. This is achievable; after all, the request was not for a photo display of every possible
  iteration of the ordinance. The public wants to get a basic idea of what is allowed, and what is
  not allowed. Admittedly, the ordinance language is a bit convoluted, and practical application—
  enforcement of a regulation (the real bottom line)—is what matters to the public, and is what
  needs to be defined. 4

6) dEIR, Page 3.0-2, regarding biological resources: “...any sign constructed in accordance with the Sign
Ordinance will be required to comply with all applicable regulations, which would include federal and
state species and habitat protection and permitting requirements. It would also require compliance with
the County’s oak woodland and native vegetation and landmark tree General Plan policies and
standards. Therefore, the proposed project would not have a substantial adverse effect on special-status
species, riparian or other sensitive habitat, wetlands, or waters of the United States or waters of the
State, interfere with wildlife migration corridors, conflict with General Plan policies for tree preservation,
or conflict with any conservation plan. There would be no impact, and this issue is not evaluated
further.”

4 “A prejudicial abuse of discretion occurs if the failure to include relevant information prejudices informed decision
making and informed public participation, thereby thwarting the statutory goals of the EIR process.” [Kings County
Farm Bureau et al. v. City of Hanford (5th Dist. 1990) 221 Cal.App.3d 692, 712.]
Letter 8 Continued

- This statement is not supported by fact (see Attachments). While implementation of this ordinance may not specifically impact special status species, it is likely—especially in the case of digital billboards—that it will impact wildlife. Compliance “with all applicable regulations” does not eliminate impacts to biological resources.

Requests for Information

1) Please make any necessary corrections to Table 1, cite the source of the correction, and include the information in the final EIR.

2) Because it is clear the proposed ordinance allows more signs to be erected in El Dorado County (EDC) than the existing ordinance. Therefore, please discuss in the final EIR how the proposed ordinance is “more protective” of EDC’s scenic resources than the existing sign ordinance.

3) Please explain in the final EIR why the No Project alternative is not identified as the “environmentally superior alternative,” given the obvious increase in allowable signs under the proposed ordinance.

4) Because this ordinance is presented as an ordinance that is “...intended to bring the sign ordinance in compliance with the General Plan” (deIR 2.6 Required Approvals, page 2.0-14), please explain in the final EIR how/where/why the current ordinance is out of compliance with the General Plan (and cite sections to support explanation).

5) Please provide the requested sign photos, and include them in the final EIR.

6) Include in the final EIR the State law language which will enable EDC to remove nonconforming signs (e.g., “signs that are protected from removal by applicable provisions of state law may be removed only as allowed by state law.”) Explain how this might apply to billboards, and explain if it will apply to the three billboards constructed along Highway 50 between Cameron Park and Shingle Springs.

7) Explain exactly what the following means/entails: “Abatement. The county shall order the sign to be abated by the property owner and/or person responsible for its installation and/or maintenance.” Does this mean there will be fines imposed, or simply that the sign must be removed?

8) Proposed Ordinance, page 26: 17.16.090 Prohibited Signs. While this section identifies existing billboards as nonconforming signs (and protected from removal by applicable state law), amortization timelines for nonconforming signs (assuming they apply to existing billboards) are not included in the proposed ordinance. The deIR, page 3.1-3 under “Existing Conditions,” presents the following General Plan Policy 2.7.1.2: “Existing billboards within scenic corridors shall be removed or relocated out of the corridor allowing an adequate time period for billboard owners to amortize the value of their signs pursuant to an amortization schedule to be included in the Sign Ordinance.” But there is no amortization schedule in the proposed sign ordinance. There was a table for amortization for Nonconforming Signs in the July 22, 2014 version of the proposed sign ordinance (Table 17.16.100.1, page 28), but it appears to have been omitted from the December 11, 2014 version.
Letter 8 Continued

In addition, Section 2.3.3 of the dER, page 2.0-5, “Proposed General Plan Amendment,” presents the following in which amortization language in the General Plan Policy is proposed to be stricken (language to be removed presented in strikethrough; language to be added in underline):

“The Planning Commission and the Board of Supervisors will also consider amendment of the General Plan as follows:”

Policy 2.7.1.2 – Existing billboards within designated scenic corridors shall be removed or relocated out of the corridor in accordance with state and federal law, allowing an adequate time period for billboard owners to amortize the value of their signs pursuant to an amortization schedule to be included in the Sign Ordinance.

Therefore, please explain why the amortization schedule was removed from the proposed ordinance, and explain why the General Plan policy discussing amortization was included in the dER (page 3.1-3).

9) Please include in the final EIR responses to questions and requests for information that were included in my letter submitted in response to the Notice of Preparation for this project, and that were not responded to in this dER (see Appendix D).

10) Please include in the final EIR a comprehensive discussion of the possible/likely impact of digital and non-digital lighted signs on biological resources in EDC.
3.0 COMMENTS AND RESPONSES

Letter 8 Continued

APPENDIX A

FOOTNOTES FOR TABLE 1

1. Nothing in the current ordinance allows the placement of billboards. In fact, a stationary billboard advertising a housing development was recently removed by EDC Code Enforcement (see NOTE at end of this Appendix). Existing billboards are the result of grandfathered billboards (very old installations in place prior to ordinance adoption), or were the result of a procedural error (as in the case of the Cameron Park/Shingle Springs installations) where the applicant was able to install billboards based on County inattention to State law regarding permit application time frames.

2. While section 17.16.010, Content and Applicability, page 1 of the proposed ordinance states, “Specifically, this Chapter... eliminates billboards along identified scenic and historic routes (Objective 2.7.1)” there is no language in the ordinance itself that implements this statement. In fact, the amendment itself indicates only that the Planning Commission (PC) and Board of Supervisors (BOS) will “consider amendment” of the General Plan Objective 2.7.1 and Policy 2.7.1.2. If the PC and BOS accomplish amendment, an implementing ordinance will need to be adopted, and even then billboards can only be moved or removed “in accordance with state and federal law.”

The proposed amendment is presented below:

**2.3.3 PROPOSED GENERAL PLAN AMENDMENT** (DEIR, page 2.0-5)

“The Planning Commission and the Board of Supervisors will also consider amendment of the General Plan as follows:

**Objective 2.7.1 Signs Regulation** - Regulation of the location, number and size of highway signs and potential relocation or elimination of billboards along designated scenic corridors and historic routes (as may be designated in the future) in accordance with state and federal law.

**Policy 2.7.1.2** - Existing billboards within designated scenic corridors shall be removed or relocated out of the corridor in accordance with state and federal law.”

Because there is no implementing language in the Zoning Ordinance, no assurance that the PC and BOS will accomplish this amendment, and no assurance that the specific billboards in question can be moved or removed legally under state or federal law, this language is moot.

Policy 2.7.1.2—Not just the Objective—needs to specify that billboards along designated scenic corridors and historic routes (as may be designated in the future) can potentially be relocated or eliminated in accordance with state and federal law. [In fact—A separate but pertinent issue—the Objective could be interpreted to apply only to scenic corridors and historic routes that are yet to be designated (In the future), which is probably not the intention, or it could be interpreted to apply to existing designated scenic corridors and historic routes yet to be designated in the future, which is probably the case.)

In addition, because the proposed amendment to Policy 2.7.1.2 does not include “historic routes,” it must be noted that this policy must be amended, too, if existing billboards along historic routes are to be removed or relocated. (Only Objective 2.7.1 contains language pertinent to historic routes.) In any case, the policy may not be amendable if there is no state and federal law that applies to “historic routes.”

Standing in contradiction to the preceding General Plan Objective and Policy amendment proposal is the following language in the proposed ordinance:

17.16.040(4) Designated State Scenic Highway Corridors In El Dorado County shall be subject to special sign regulations under “Design Review - Scenic Corridor Ordinance” in the reserved Section 17.27.070 of the draft Zoning Ordinance.

17.16.070 Sign Development and Design Standards
J. Standards for U.S. Highway 50-Oriented Signs.
4. Height. The maximum height of U.S. Highway 50-Oriented signs shall be as follows:
Letter 8 Continued

3.0-55

a. For single-tenant signs, 1.5 times the height of an adjacent structure up to a maximum of 30 feet. Within designated scenic corridors, the maximum height of a single-tenant sign shall be 24 feet.

b. For multi-tenant signs, a maximum of 60 feet. Within designated scenic corridors, the maximum height of a multi-tenant sign shall be 48 feet.

7. Special Development and Design Standards for Designated State Scenic Highway Corridors. (Reserved for future Scenic Corridor Ordinance)

And, it should be noted, EDC has relatively few designated scenic highway corridors:

Officially designated State scenic highway corridors (Section 263 of the Streets and Highways Code) include:

• Highway 50 from east limit of government center interchange in Placerville to Echo Summit;
• Highway 50 from Echo Summit to south Lake Tahoe city limit; and
• Highway 89 from Alpine County line to Placer County line.

3. The Thompson’s mobile billboard at the corner of South Shingle Road and Durock Road in Shingle Springs was removed under the existing sign ordinance. On February 23, 2014 Lillian MacLeod, Principal Planner, EDC Community Development Agency, Planning Services Division, determined that there was no legal entitlement for the Thompson’s mobile billboard to be at the site (on private property not owned by Thompson’s), and on February 24, 2014 issued a directive to EDC Code Enforcement for its removal. It was subsequently removed, but “reappeared” at the same location by May 29, 2014.

Whether mobile billboards are allowed under the proposed ordinance may depend upon the message presented on mobile billboard, or on the interpretation of the Code Enforcement supervisor. Example: The Thompson’s mobile billboard has not been moved because it has been identified as a “Community Event” billboard by the Code Enforcement supervisor, even though it presents off-site advertising for the mobile billboard owner. It has thus been allowed off-site, on private property not owned by the mobile billboard owner, without a Special Use Permit. (Communication from Jim Wassmer, past Code Enforcement Supervisor, dated October 20, 2014; see NOTE at the end of this Appendix.) It can be assumed this mobile billboard has been allowed to remain because it may become a legitimate installation after the proposed sign ordinance is adopted.

Also, signs advertising subdivisions—soon to be allowed under the proposed ordinance—are often mounted to trailers (thus, they are mobile billboards)—and seem to have become the industry standard for the advertisement of subdivisions (as seen in the Scott Road area of Sacramento County).

4. On-site signs within 100 feet of U.S. Highway 50 are allowed outside of the officially designated scenic corridor, subject to a Design Review Permit (DRP).

5. Project Alternative 4.3 (dEIR, page 4.0-2) is a No Digital Sign Alternative. “The No Digital Signs Alternative assumes that all portions of the proposed Sign Ordinance update would be adopted, with the exception that digital signs would not be allowed.” However, if this alternative is not adopted, digital signs will be allowed in EDC.

6. dEIR Section 2.1, page 2.0-1: “The proposed update provides for the use of moving signs...or electronic (digital) signs that may use animation, flashing, scrolling, or video screens under certain conditions, whereas the existing Sign Ordinance specifically prohibits all flashing or moving signs.”

7. 17.16.050 Temporary Signs (page 8-9, proposed sign ordinance)

C. Message: “Temporary signs displaying a commercial message shall be limited to on-site signage only. Off-site signage displaying a commercial message shall not be allowed, except as noted in Section 17.16.030.B.9”

17.16.030 Exemptions (Pages 3, 5, 87)

B. Exempt Signs With Limitations

9. “Off-site commercial signs, located on private property within the designated rural areas of the County,
for establishments that are not directly abutting County roads. For those establishments located on private roads, each establishment is allowed 1 non-illuminated commercial identification and directional sign with a maximum sign area of 16 square feet and a maximum height of 12 feet. Such signs may be permanent or temporary and require property owner consent. This provision does not allow general advertising for hire.”

8. Signs can be affixed to private property with consent of the property owner (page 29-30, proposed sign ordinance):
17.16.030 Prohibited Signs
B. “The signs listed in this Section are prohibited in all zones. Except as otherwise specifically noted herein, these prohibitions apply in all unincorporated (urban and rural) areas of the County.”
12. “Signs affixed to a structure or property not owned by the person or entity installing the signs, unless authorized by the written consent of the owner of the structure or property. For purposes of this provision, “owner” means any person or entity holding the immediate right of possession and control.”


10. While the DEIR states (page 29-3: 12) that the proposed sign ordinance “Establishes regulations for abatement or removal of illegal, abandoned, and nonconforming signs as allowed by state law,” the existing sign ordinance references (utilizes) abatement measures:

Zoning Ordinance, 2009
Chapter 17.12 ENFORCEMENT
17.12.040 Abatement of nuisance
17.12.040 Abatement of nuisance. Any building or structure set up, erected, constructed, altered, enlarged, converted, moved or maintained contrary to the provisions of this article and/or any use of any land, building or premises conducted, operated or maintained contrary to the provisions of this article shall be and is declared to be unlawful and a public nuisance, and the district attorney of the county shall, upon order of the board of supervisors, immediately commence action or proceedings for the abatement and removal and enjoinder thereof in the manner provided by law, and shall take such other steps and shall apply to such court or courts as may have jurisdiction to grant such relief as will abate and remove the building or structure and restrain and enjoin any person, firm or corporation from setting up, erecting, building, maintaining or using any such building or structure or using any property contrary to the provisions of this article. (Prior code §3475(d))

Furthermore, while the proposed sign ordinance uses abatement language, that language says—in the case of nonconforming signs, that nonconforming signs “shall be protected from removal”:

17.16.100 Illegal, Abandoned, and Nonconforming Signs
A. Illegal Signs. Illegal signs shall be abated by the property owner or person responsible for installing or maintaining the sign.
C. Nonconforming Signs
1. Removal/Abatement. Any sign which becomes nonconforming as a result of the provisions of this Chapter shall be protected from removal by applicable provisions of state law and may be removed only as allowed by state law. Removal/Abatement. Any sign which becomes nonconforming as a result of the provisions of this Chapter shall be protected from removal by applicable provisions of state law and may be removed only as allowed by state law.

11. The existing sign ordinance references penalties for violation, as follows:
17.12.030 Penalty for violation. Any person, firm, partnership, association, corporation, or other entity whether as principal, agent, employee or otherwise, violating any of the provisions of this article or any zoning law or ordinance shall be guilty of a misdemeanor and upon conviction thereof shall be punishable by a fine of not more than one thousand dollars or by imprisonment in the county jail for a term not exceeding six months or by both such fine and imprisonment. Such person, firm, partnership, association, corporation or other entity
shall be deemed to be guilty of a separate offense for each and every day during any portion of which any violation of this article or any zoning law or ordinance is committed, continued or permitted by such person, firm or corporation, and shall be punishable as provided in this section. At the discretion of the community development department, or the district attorney, the violation may be reduced to an infraction with a maximum fine of five hundred dollars. (Ord. 3831 §13, 1988)

The proposed sign ordinance, on the other hand, would rely on the following language in the Update to the Zoning Ordinance (2014) for the application of penalties:

**ZONING ORDINANCE UPDATE, 2014**

**CHAPTER 17.67 – CODE ENFORCEMENT**

**17.67.040 Abatement of Nuisance and Penalty for Violation**

* Any structure erected, constructed, altered, enlarged, converted, moved, or maintained, or any land or structure that is used contrary to either the provisions of this Title or any condition of approval imposed through discretionary authorization, shall be declared unlawful and be subject to the provisions of Chapter 9.02 (Code Enforcement). Any act or omission made unlawful under this Title shall also include abetting, aiding, allowing, causing, or permitting the act or omission.

The problem is, Chapter 9.02 is under revision and it is not known if this Section will be amended. Chapter 9.02 also includes what could be construed as an important “out” for enforcement authorities that are reluctant to enforce County code: “Informal oral or written requests to encourage compliance are encouraged, as are attempts to informally negotiate or mediate issues relating to compliance.” While the approach referred to in this section of the code is commendable—obviously a preferable way to solve the majority of violations—if it is used by County staff as a means to not enforce code (because staff may be uncomfortable with “push back” from businesses), this could mean removal of unauthorized signs will not be accomplished. After all, this language instructs/allows the enforcement authority to “encourage compliance.” It doesn’t indicate compliance is required post “encouragement.” As commendable—and sensible—as this portion of the code sounds, the language doesn’t indicate compliance is the endpoint.

**NOTE:** Email from Jim Wassner, Code Enforcement Supervisor:

From: Jim Wassner <jim.wassner@edcgov.us>
Date: Mon, Oct 20, 2014 at 3:50 PM
Subject: Re: Draft Sign Ordinance--File# 13-0086; OR12-0001
To: Anne Novotny <anne.novotny@edcgov.us>

Anne,

I apologize, I had not seen the sign question for me. I had not gone thru the sign photos in the original email. There was a commercial billboard sign advertising one of the housing tracts. A Courtesy Notice was sent and the owner removed the sign. Thompson’s mobile sign advertises community events, which is not a commercial use.

Jim Wassner
Supervising Code Enforcement Officer
3.0 COMMENTS AND RESPONSES

Letter 8 Continued

APPENDIX B

EXISTING ZONING ORDINANCE
TITLE 17 EL DORADO COUNTY CODE
Revised December 2009

Chapter 17.16 SIGNS
Sections:
17.16.010 Exception—Official public signs.
17.16.020 Exception—Identification sign.
17.16.030 Exception—Wall signs.
17.16.040 Face used to determine area.
17.16.050 Location.
17.16.060 Resemblance to traffic signs prohibited.
17.16.070 Lighting.
17.16.080 Moving signs prohibited.
17.16.090 Three-dimensional signs.
17.16.100 Number permitted.
17.16.110 Special use in one district nontransferable.
17.16.120 Off-premises signs.

17.16.010 Exception—Official public signs. Sign provisions shall not apply to official public signs located within the public rights-of-way. (Prior code §94300)((1))

17.16.020 Exception—Identification sign. Sign area provisions shall not apply to signs expressing by letter, figures or symbols, direction or identification such as address, name, access or parking, and not exceeding four square feet each. (Prior code §94300)((2))

17.16.030 Exception—Wall signs. Sign area provisions shall not apply to signs using the wall of a building as the surface or attached to the wall of a building, providing the signs do not project more than twelve inches beyond the exterior face of the wall, providing the wall is a non-projecting, integral part of the building and providing the aggregate area of the wall sign does not exceed twenty percent of the total area of the wall; and further provided that the signs shall advertise only such general product, or products, and/or service, or services, as is or are actually sold, dispensed or rendered on the premises. (Prior code §94300)((3))

17.16.040 Face used to determine area. Sign area provisions shall apply to the overall display surface of the single largest face of the sign and not to the aggregate of display faces. (Prior code §94300)((4))

17.16.050 Location. Signs may be located on the required yards or setbacks, providing they do not constitute a hazard to pedestrians or vehicular traffic, do not conceal from view any public sign or traffic signal and are not located on nor extend onto or project over public right-of-way without having first obtained a written revocable permit from the director of department of transportation to do so. Signs must comply with zoning requirements and shall be allowed only where the county road right-of-way is one hundred feet or more in width and where the traveled way and shoulders do not cover the entire right-of-way. Fees for the permit shall be established, paid and expended as provided in Section 12.08.150. The board of supervisors may appoint one or more local committees to advise and make recommendations to the director of department of transportation and the board of supervisors.
Letter 8 Continued

regarding the issuance of the permits. When any such committee has been appointed by the board of supervisors, the director of department of transportation shall refer pertinent requests for the permits to the appropriate committee for recommendation prior to issuance of the permit. (Ord. 3766 §65, 1987: prior code §9430(i)(5))

17.16.050 Resemblance to traffic signs prohibited. Signs shall not resemble any official traffic or identification signs or signals, or use terms such as “stop” or “danger” in a manner which might create public confusion. (Prior code §9430(i)(6))

17.16.070 Lighting. Lighted signs shall not be blinking and shall be controlled so that visibility of vehicular traffic is not impaired, and objectionable glare is shielded from adjoining residential zones. (Prior code §9430(i)(7))

17.16.080 Moving signs prohibited. Moving signs or parts of signs shall not be allowed. (Prior code §9430(i)(8))

17.16.090 Three-dimensional signs. Three-dimensional signs shall be allowed, providing they are nonrepresentational. (Prior code §9430(i)(9))

17.16.100 Number permitted. It shall not be construed that, as a matter of right, the use of more than two signs shall be allowed subject to the exceptions contained in Section 17.16.010 and 17.16.020. (Prior code §9430(i)(10))

17.16.110 Special use in one district nontransferable. It shall not be construed that an allowable sign by special use permit in one or more land use districts shall be deemed allowable as a matter of right in any other district or districts not expressly providing for the use. (Prior code §9430(i)(11))

17.16.120 Off-premises signs.
A. Off-premises signs, not otherwise regulated by this title, may be established by special use permit upon following the procedure set forth in Chapter 17.22.
B. Prior to the issuance of a special use permit for off-premises signs, the zoning administrator shall consider the location, size and display of the sign for compliance with the policies of the general plan land use element. (Ord. 3414, 1985)

Sign Provisions Listed in Zoning Ordinance—Sections Other than Chapter 17.16 (SIGNS)

Chapter 17.14 MISCELLANEOUS DEVELOPMENT REQUIREMENTS
I. GENERALLY
17.14.170 Outdoor Lighting
C. Outdoor Lighting Standards.
7. Lighted signs shall also conform to Section 17.16.070.
17.16.070 Lighting. Lighted signs shall not be blinking and shall be controlled so that visibility of vehicular traffic is not impaired, and objectionable glare is shielded from adjoining residential zones. (Prior code §9430(i)(7))

17.14.190 Ranch marketing
17.14.190(B)
(3) Permitted by special use permit:
Letter 8 Continued

(c) Signs in excess of that permitted by right, including flags, banners, balloons and other temporary signs.

E. Development Standards:
3. Signs. The following signs are allowed for any winery that is allowed by right:
   a. One unlighted on-site sign advertising authorized activities not to exceed 32 square feet on either sign face, with a total not to exceed 64 square feet for a double-faced sign.
   b. In addition, one off-site sign of the same size may be approved by Administrative Permit, with the property owner’s permission and specific findings regarding the proximity to the winery; zoning; and the need for the off-site sign due to the location of the access road.
   c. Small off-site directional signs, not exceeding 8 square feet, may also be approved with the property owner’s permission through the Administrative Permit process with the submittal of a plan showing the location of each sign and the need for each of the directional signs. Additional signage may be permitted by CUP.
   d. Industry association signs as approved by the Board of Supervisors, such as Farm Bureau, Farm Trails, Apple Hill, Fair Play Winery Association, and El Dorado Winery Association, shall be exempt from these provisions.
   e. Signs. Micro-winery signs are limited to one on-site unlighted sign, six square feet in area, six feet in height, advertising the name of the winery and owner. The sign must also state "not open to the public."

17.18.070 Parking lot construction standards.
H. Directional Arrows and Signage. Aisles, approach lanes, pedestrian crossings, and drop-off/loading areas shall be clearly marked with directional lines and signs to expedite traffic movement.

17.23.025 Temporary uses subject to standard conditions.
A. Christmas Tree Sales Lots
2. A minimum setback of ten feet shall be established between the street right-of-way and the Christmas trees, signs or any structures;
3. Signs shall not exceed three in number, nor should the total combined sign area exceed fifty square feet;

17.23.050 Time limits. The planning director in conjunction with the other affected county departments shall determine the time limitations of temporary uses which shall not exceed the following maximum time limits for the following uses:
C. Thirty consecutive days:
   1. Grand opening signs (one time only per use).

17.26.040 Uses requiring special use permit. The following uses are allowed only after obtaining a special use permit therefor from the county planning commission:
A. All other buildings, structures, signs, uses or expansion thereof. (Ord. 3606 §4, 1986; Ord. 3439 §1, 1984; Ord. 3366 §3, 1983; Ord. 3364 §2, 1983; prior code §9410(d))

Chapter 17.26
UNCLASSIFIED (U) DISTRICTS
17.26.040 Uses requiring special use permit. The following uses are allowed only after obtaining a special use permit therefor from the county planning commission:
A. All other buildings, structures, signs, uses or expansion thereof. (Ord. 3606 $4, 1986; Ord. 3439 $1, 1984; Ord. 3366 $3, 1983; Ord. 3364 $2, 1983; prior code §5410(d))
Chapter 17.28

RESIDENTIAL DISTRICTS
For the following districts:
I. ONE-FAMILY RESIDENTIAL (R1) DISTRICTS
II. ONE-ACRE RESIDENTIAL (R1A) DISTRICTS
III. LIMITED MULTIFAMILY RESIDENTIAL (R2) DISTRICTS
IV. ESTATE RESIDENTIAL FIVE-ACRE (RE-5) ZONE DISTRICTS
V. SINGLE-FAMILY TWO-ACRE RESIDENTIAL (R2A) DISTRICTS
IX. ONE-HALF ACRE RESIDENTIAL (R-20,000) DISTRICTS
X. SINGLE-FAMILY THREE-ACRE RESIDENTIAL (R3A) DISTRICTS

(17.28.020, et al) Uses permitted by right. The following uses are allowed by right, without special use permit or variance:
C. Home occupations such as accountant, advisor, appraiser, architect, artist, attorney, author, broker, dressmaker, draftsman, dentist, handicrafts, insurance, photographer, physician, therapist, musician, teacher and other similar occupations normally conducted by mail or telephone on the premises where the activities do not create a traffic problem; provided, that instruction is not given to groups in excess of four, and concerts or recitals are not held, and no display of goods is visible from the outside of the property; such use must be carried on in the main building and be incidental to the residential use of the premises and be carried on by a resident thereon;
G. in area advertising authorized activities on the premises;
8. On-site signs shall conform to the provisions of this section;
(17.28.030, et al) Uses requiring special use permit.
F. Other sign sizes and applicable general provisions as itemized in Chapter 17.16;

17.28.010 Applicability. The regulations set forth in Sections 17.28.020 through 17.28.040 shall apply in all R1 districts (one-family residential district) and shall be subject to the provisions of Chapters 17.14, 17.16 and 17.18. (Prior code §9411(permit))
17.28.020 Uses permitted by right.
J. Real estate sales office within an approved recorded subdivision for the exclusive sale of property within the subdivision subject to the following requirements:
8. On-site signs shall conform to the provisions of this section;

VI. TOURIST RESIDENTIAL (RT) DISTRICTS
17.28.230 Uses permitted by right. The following uses are allowed by right, without special use permit or variance:
D. One sign not exceeding eighty square feet in area, advertising authorized activities on the premises
17.28.240 Uses requiring special use permit. The following uses are allowed only after obtaining a special use permit therefor from the planning commission
G. Other sign sizes and applicable general provisions as itemized in Chapters 17.14, 17.16 and 17.18

For the following districts:
I. RESIDENTIAL AGRICULTURAL-20 (RA-20) DISTRICTS
II. RESIDENTIAL AGRICULTURAL-40 (RA-40) DISTRICTS
III. RESIDENTIAL AGRICULTURAL-60 (RA-60) DISTRICTS
IV. RESIDENTIAL AGRICULTURAL-80 (RA-80) DISTRICTS
V. RESIDENTIAL AGRICULTURAL-160 (RA-160) DISTRICTS

Uses requiring special use permit. The following uses are allowed only after obtaining a special use permit therefor from the planning commission or zoning administrator:

A. All other buildings, structures, signs, uses or expansion thereof;

I. COMMERCIAL (C) DISTRICTS
17.32.020 Uses permitted by right. The following uses are allowed by right, without special use permit or variance:

D. Two signs not exceeding fifty square feet in total area of any one display surface, or one sign not exceeding eighty square feet in area, advertising authorized activities on the premises;

II. PROFESSIONAL OFFICE COMMERCIAL (CPO) DISTRICTS
17.32.050 Uses requiring site plan approval.

A. The following uses are permitted without special use permit, but only after obtaining approval of the site plan therefor, from the planning director who shall act thereon within fifteen days after submittal. The planning director shall find that the proposed uses, architectural design, building siting, landscaping, parking and signs will be compatible and harmonious with existing and proposed adjacent developments and any contiguous like uses. If the applicant is not satisfied with the requirements or actions of the planning director, the applicant may request a review by the planning commission which shall hear the site plan review within thirty days of the request. Decisions of the planning commission may be appealed pursuant to the provisions of Chapter 17.08.

B. The provisions of Chapters 17.14, 17.16 and 17.18 shall apply to such uses as listed below:

c. Wall signs when designed as an integral part of the building or complex and related only the name and use of the building or complex. Such wall signs may also contain the names and specialties of the occupants when no freestanding sign is utilized,

d. Total sign area of paragraphs c and d combined shall not exceed fifty square feet, and

e. One nameplate not exceeding three square feet with letters and symbols not exceeding twelve square inches each and signifying the name and specialty of the occupant;

IV. PLANNED COMMERCIAL (CP) DISTRICTS
17.32.140 Uses requiring site plan approval.

D. Two signs not exceeding fifty square feet in total area of any one display surface, or one sign not exceeding eighty square feet in area, advertising authorized activities on the premises;

17.30.040 Uses requiring special use permit. The following uses are allowed only after obtaining a special use permit therefor from the planning commission or zoning administrator:

A. All other buildings, structures, signs, uses or expansion thereof;

V. GENERAL COMMERCIAL (CG) DISTRICTS
17.32.200 Development standards

F. Signs allowed by right, two signs, neither of which shall exceed fifty square feet in total area of any one display surface or one sign not exceeding eighty square feet in area, advertising authorized activities on the premises and subject to all applicable general provisions and exceptions pertaining to signs in Chapters 17.14, 17.16 and 17.18. (Prior code §9419(g),(h))
3.0 COMMENTS AND RESPONSES

Letter 8 Continued

I. INDUSTRIAL (I) DISTRICTS
17.34.020 Uses permitted by right.
F. Two signs not exceeding fifty square feet in total area of any one display surface, or one sign not exceeding eighty square feet in area advertising authorized activities on the premises. (Ord. 3606 §46, 1986; Ord. 3419 §16, 1984; prior code §9414(a))

Chapter 17.35
RESEARCH AND DEVELOPMENT ZONE DISTRICT (R&D)
17.35.030 Development standards.
D. Minimum Setbacks and Buffers.
1. Front Setback. All buildings, structures, parking and loading areas, except signs shall be set back at least a minimum of twenty feet with an average setback of thirty feet from the property line. Signs, except entry monument signs, shall be set back from the street right-of-way at least ten feet. When located on corner or double frontage lots involving a major collector, thoroughfare or arterial, signs shall not be oriented to front upon such major collector, thoroughfare, or arterial. Entry monument signs shall be set back at least twenty feet from the street right-of-way.
F. Signs. The developer of a project shall present for approval and shall coordinate the approved uniform sign package for his entire development prior to obtaining a building permit for any structure. The number of signs per business shall not exceed either:
1. One freestanding sign no greater than fifty square feet in area and no greater than twelve feet in height; or
2. Two signs attached to the face of a building no greater than eighty square feet in aggregate area which shall not extend above the vertical face of any building wall.
No more than two entry monument signs no greater than ten feet in height and sixty feet in length shall be permitted to identify the entire tract of parcels developed within any industrial subdivision.

I. AGRICULTURAL (A) DISTRICTS
17.36.030 Uses permitted by right.
G. One unlighted sign located on-site advertising authorized activities. The sign's display area shall not exceed sixteen square feet on either sign face with a total no greater than thirty-two square feet for a double-faced sign. Freestanding signs shall not exceed twelve feet in height.

Grower association signs, such as Farm Trails, Apple Hill, Winery, Farm Bureau, 4-H or any other grower associations representing a group of growers, shall be exempt from these provisions;

II. EXCLUSIVE AGRICULTURAL (AE) DISTRICTS
17.36.070 Uses permitted by right.
E. One unlighted sign in view of the public roadway, not exceeding thirty-two square feet of display area on any one sign, and not more than sixty-four square feet total display area, and not more than twelve feet above ground level, advertising authorized agriculture activities on the premises. Grower association signs, such as Farm Trails, Apple Hill, Winery, Farm Bureau, 4-H or any other grower associations representing a group of growers, shall be exempt from these provisions. Signs warning against trespass, hunting or shooting on the premises not more than one hundred sixty-eight square inches in size and not less than two hundred feet apart.

III. PLANNED AGRICULTURAL (PA) DISTRICTS
17.36.230 Uses permitted by right.
Letter 8 Continued

C. One unlighted sign located on-site advertising authorized activities. The sign’s display area shall not exceed sixteen square feet on either sign face with a total no greater than thirty-two square feet for a double-faced sign. Freestanding signs shall not exceed twelve feet in height. Grower association signs, such as Farm Trails, Apple Hill, Winery, Farm Bureau, 4-H or any other grower associations representing a group of growers, shall be exempt from these provisions;

Chapter 17.40
MOBILE HOME DISTRICTS
17.40.130 Signs.
17.40.130 Signs. Park identification signs shall be subject to architectural review by the planning department. No flashing or revolving signs will be permitted. Identification signs shall be limited to one eighty square feet sign per park, not to exceed a height of thirty-five feet above the ground. Each mobile home park shall maintain an additional directory sign showing the location and house number of each mobile home unit. Incidental signs may be permitted upon approval by the planning commission. (Prior code §9422(b)(18))

Chapter 17.44
TIMBERLAND PRESERVE ZONE (TPZ) DISTRICT
17.44.030 Uses permitted by right.
J. Signs warning against trespass, hunting or shooting on the premises;
K. Signs indicating the name of the owner, the property and the agricultural products produced on the premises; provided that no more than two such signs shall be erected on each parcel under separate ownership and no such sign shall exceed thirty-two square feet in area;

Chapter 17.46
MINERAL RESOURCE (MR) DISTRICTS
17.46.030 Uses permitted by right.
C. Two unlighted signs in view of the public roadway, not exceeding twelve square feet of display area on any one sign, and not more than twenty-four square feet total display area, and not more than twelve feet above ground level, advertising authorized agriculture activities on the premises;

III. LAKE TAHOE BASIN LAND USE ZONING
Chapter 17.54
UNCLASSIFIED DISTRICTS
17.54.040 Uses requiring special use permit. The following uses are allowed only after obtaining a special use permit therefor from the planning commission:
A. All other buildings, structures, signs, uses or expansion thereof. (Prior code §9500(d))

Chapter 17.58
COMMERCIAL DISTRICT
III. GENERAL COMMERCIAL (TC) DISTRICTS
17.58.150 Signs
I. COMMERCIAL (TC) DISTRICTS
D. Two signs not exceeding fifty square feet in total area of any one display surface, or one sign not exceeding eighty square feet in area, advertising authorized activities on the premises;
II. PLANNED COMMERCIAL (TCP) DISTRICTS
D. Two signs not exceeding fifty square feet in total area of any one display surface, or one sign not exceeding eighty square feet in area, advertising authorized activities on the premises;

III. GENERAL COMMERCIAL (TCG) DISTRICTS
17.58.150 Signs. Two signs, neither of which shall exceed fifty square feet in total area of any one display surface, or one sign not exceeding eighty square feet in area, advertising authorized activities on the premises and subject to all applicable general provisions and exceptions pertaining to signs in Chapters 17.14, 17.16 and 17.18 are allowed by right. (Prior code §9513(g))

Chapter 17.60
INDUSTRIAL (TI) DISTRICTS
17.60.020 Uses permitted by right
G. Two signs not exceeding fifty square feet in total area of any one display surface or one sign not exceeding eighty square feet in area advertising authorized activities on the premises. (Prior code §9506(a))

II. EXCLUSIVE AGRICULTURAL (TAE) DISTRICTS
17.62.070 Uses permitted by right.
E. Signs warning against trespass, hunting or shooting on the premises, without limitation as to size or number. Signs indicating the name of the owner, the property and the agricultural products produced on the premises, provided that no more than two such signs shall be erected on each parcel under separate ownership, and no such sign shall exceed thirty-two square feet in area;

Chapter 17.66
TAHOE MOBILE HOME PARK (TMP) DISTRICTS
17.66.160 Signs
17.66.160 Signs. Park identification signs shall be subject to architectural review by the planning department. No flashing or revolving signs will be permitted. Identification signs shall be limited to one eighty square foot sign per park, not to exceed a height of thirty-five feet above ground. Each mobile home park shall maintain an additional directory sign showing the location and house number of each mobile home unit. Incidental signs may be permitted uponapproval by the planning commission. (Prior code §9516 (b)(16))

IV. LAND USE REGULATIONS
Chapter 17.68
OPEN SPACE (OS) DISTRICT
17.68.040 Uses permitted by right.
F. Signs warning against trespass, hunting or shooting, not to be located closer than one-eighth mile from a similar sign, such signs not to exceed two square feet in area. (Ord. 3606 §60, 1986; Ord. 3365 §48, 1983; prior code §9703(a))
17.68.050 Uses requiring special use permit.
B. All signs not allowed by right;

II. CONSERVATION (CN) DISTRICTS
17.70.040 Uses permitted by right.
Letter 8 Continued

F. Signs warning against trespass, hunting or shooting, not to be located closer than one-eighth mile from a similar sign, such signs not to exceed two square feet in area. (Ord. 3606 §62, 1986; Ord. 3366 §52, 1983; prior code §9712(a))
17.70.050 Uses requiring special use permit.

B. All signs not allowed by right;

III. ESTATE RESIDENTIAL (RE-10) DISTRICTS
17.70.090 Uses permitted by right
B. Barns, agricultural structures, etc.;
C. Home occupation such as accountant, advisor, appraiser, architect, artist, attorney, author, broker, dressmaker, draftsman, dentist, engineer, handicrafts, insurance, photographer, physician, therapist, musician, teacher and other similar occupations conducted on the premises or by mail or telephone where the activities do not create a traffic problem; provided, that instruction is not given to groups in excess of four and concerts or recitals are not held, and no display of goods is visible from the outside of the property, such use must be carried on in the residence and be incidental to the residential use of the premises and be carried on by a resident thereon;
D. One unlighted sign not exceeding six square feet of message area and eight feet above ground level advertising authorized activities on the premises;
1. Real estate sales office within an approved recorded subdivision for the exclusive sale of property within the subdivision subject to the following requirements:
2. On-site signs shall conform to the provisions of this section;

Chapter 17.72
ENVIRONMENTAL IMPACT REPORTS
17.72.150 Categorical exemptions
A. Class 1—Existing Facilities
7. New copy on existing on-premises and off-premises signs;
K. Class 11—Accessory Structures
1. On-premises signs

V. DESIGN REVIEW
Chapter 17.74
DESIGN REVIEW DISTRICTS
17.74.040 Sierra design and community design review districts—Restrictions
E. The following structures shall be exempt from the review process required in this chapter, but must still comply with all other applicable provisions of the zoning ordinance:
1. Wall signs;
2. Change in text on existing signs;

17.74.045 Meyers Community Plan Design Review Process and Requirements.
C. The following minor applications are also exempt from the procedures provided in section 17.74.115, but are subject to applicable zoning regulations and the Design Review Guidelines as noted in Appendix A of the Meyers Community Plan, and shall be reviewed and approved, conditionally approved, or denied by the planning department based on those provisions:
1. Wall signs;
4. Freestanding and monument signs
APPENDIX C

ZONING ORDINANCE UPDATE (March 2014)

CHAPTER 17.27 — COMBINING ZONES
17.27.050 Design Review - Community (DC) Combining Zone
D. Exemptions. With the exception of the Meyers Community Plan Design Review Area (Subsection E), the following structures shall be exempt from the design review process required in this Section, but must still comply with all other applicable provisions of this Title and adopted community design guidelines and standards:
2. Wall signs;
3. Change in text on existing signs;
4. Meyers Community Plan Design Review Exemptions and Requirements
1. The following activities, however, are exempt from the design review process:
2. Change in size on existing signs;
3. The following minor use permit applications are also exempt from the procedures provided in this Subsection, but are subject to applicable zone regulations and the Design Guidelines as noted in Appendix A of the Meyers Community Plan, and shall be reviewed and approved, conditionally approved, or denied by the Department based on those provisions:
a. Wall signs;
d. Freestanding and monument signs;

ARTICLE 3 — SITE PLANNING AND PROJECT DESIGN STANDARDS
CHAPTER 17.36 — SIGNS RESERVED
CHAPTER 17.30 — GENERAL DEVELOPMENT STANDARDS
17.30.030 Setback Requirements and Exceptions
C. Projections into Required Setbacks
2. Front yards may have the following additional encroachments
c. Signs, subject to Chapter 17.36.

ARTICLE 4 — SPECIFIC USE REGULATIONS
CHAPTER 17.40 — SPECIFIC USE REGULATIONS
17.40.040 Adult Business Establishments
F. Signs or structures, advertisements, displays, or other promotional material depicting — specified anatomical areas or — specified sexual activities, as defined under County Code Title 5, Subsections 5.34.020 H and I, or displaying instruments, devices or paraphernalia designed for use in connection with — specific sexual activities, shall not be exhibited or shown in a way that is visible from an exterior area.

17.40.100 Campgrounds and Recreational Vehicle Parks
D. Development Standards.
6. Signs. Campground and recreational vehicle park entrance signs shall comply with the provisions under Chapter 17.36 (Signs).

17.40.110 Child Day Care Facilities
A. Child Day Care Homes.
2. Large Family Day Care Homes. Allowed under an Administrative Permit in compliance with Section 17.52.010. The following shall be submitted in addition to the standard permit application requirements:
   c. A sign plan, if applicable, demonstrating compliance with Chapter 17.36 (Signs) for residential signage

17.40.150 Home Occupations
C. Standards. A home occupation shall be allowed in compliance with the following standards and Title 5 (County Business License Ordinance):
1. All business is conducted within permitted structures on the lot or outdoors provided the business is screened from a right-of-way or road easement. The appearance of the structure shall not be altered nor shall the occupation be conducted in a manner that would cause the structure to differ from its residential character either by the use of colors, materials, construction, lighting, or signs, except where required under Paragraph 5, below.
5. A building permit for change of use for that portion of the residence utilized as an office, workroom, sales area, and restroom facilities for employees and commercial customers shall receive final occupancy approval subject to Building Code Section 11018.6 (Commercial Facilities Located in Private Residences) prior to business license approval.
E. Signs. Signs identifying authorized home business activities on the site shall be subject to the standards in Table 17.40.160.3 below. All signs shall be compatible in design with the residential structures on-site and shall not be illuminated.

<table>
<thead>
<tr>
<th>Number</th>
<th>RM, R1, R20K, R1A</th>
<th>R2A, R3A, RE-5</th>
<th>RE-10 Ag and Resource Zones</th>
</tr>
</thead>
<tbody>
<tr>
<td>Size (cumulative)</td>
<td>1 square foot</td>
<td>6 square feet</td>
<td>12 square feet</td>
</tr>
<tr>
<td>Height (maximum)</td>
<td>n/a</td>
<td>6 feet</td>
<td>8 feet</td>
</tr>
<tr>
<td>Location</td>
<td>On wall adjacent to front entrance</td>
<td>1 within front setback to be visible from the adjacent road and 1 adjacent to residence or structure where home business is conducted</td>
<td></td>
</tr>
</tbody>
</table>

17.40.170 Lodging Facilities
B. General Standards
4. One, non-internally illuminated sign shall be allowed based on the applicable zone standard set forth in Chapter 17.36 (Signs). The design of the sign shall be considered by the review authority for architectural compatibility with the existing or proposed structure(s) on-site.

17.40.210 Outdoor Recreational Facilities – Commercial or Public
F. Parks, Day Use.
4. Signs shall be in compliance with Chapter 17.36.

17.40.220 Outdoor Retail Sales
B. Permanent Outdoor Retail Sales.
3. All development standards under the specific zone shall apply, as well as those general standards applicable to the site plan, such as landscaping, lighting, signs, and noise (Chapters 17.33, 17.34, 17.36, and 17.37, respectively).
C. Temporary Outdoor Retail Sales.
2. Hours of Operation. The temporary sales area shall be conducted during daylight hours only, with all sales facilities, signs, and any related vehicles removed from the site at the close of daily business. Except where otherwise prohibited by this Section, night operations are allowed only when specifically authorized through Temporary Use Permit approval (Section 17.52.060).

5. Signs. Signs allowed in conjunction with temporary outdoor retail sales are subject to the provisions of Chapter 17.36 for size and placement standards. Sign placement shall be limited to one day prior to the first day of the sales event and removal shall be required at the close of business on the last day of the event.

E. Garage Sales.
5. **Garage sale advertising signs** shall comply with the standards under Paragraph C.5 as to duration, and further shall not be posted on telephone poles, streetlights, traffic signs, or any other structure or location within the public right-of-way.

17.40.230 Private Schools in Light Manufacturing Facilities
C. Permit Requirements
4. The private school conforms to all other requirements of this Title, including, but not limited to parking and signs (Chapters 17.35 and 17.36, respectively).

17.40.260 Ranch Marketing
E. Development Standards
3. Signs. Small off-site directional signs not exceeding two square feet each may also be approved by Administrative Permit, subject to the property owner’s permission. Submittal of a site plan showing the location of each sign, and a statement addressing the need for each of the signs is required.

17.40.330 Temporary Real Estate Sales Offices
B. General Standards
4. On-site signage and landscaping shall be in compliance with Chapter 17.36 (Signs) and Chapter 17.33 (Landscaping).

17.40.360 Transitional Housing
B. General Standards
4. No identification signs shall be allowed within any zone allowing single-unit residential use. Signs for transitional housing within nonresidential zones shall comply with Chapter 17.36 (Signs).

17.40.390 Wind Energy Conversion Systems
E. Development Standards
12. Signs. Signage shall be considered as part of a Conditional Use Permit, and shall be limited to the following:
   a. Signs warning of high voltage electricity shall be posted at a height of five feet above the ground on stationary portions of the WECS or its tower, and at gated entry points to the project site.
   b. No advertising sign or logo shall be placed or pointed on any WECS or tower.
   c. For wind farms, no more than two identification signs relating to the development shall be located on the project site.
   d. Signs shall not exceed 16 square feet in surface area or eight feet in height.
Letter 8 Continued

17.40.400 Wineries
G. Development Standards.
3. Signs. See Table 17.36 (Signs).
a. Small, off-site directional signs, not exceeding two square feet each, may also be approved by Administrative Permit, subject to the property owners' permission, submittal of a site plan showing the location of each sign, and a statement addressing the need for each of the signs.

H. Micro-Wineries and Small Vineyards.
2. Micro-Winery Standards
d. On-site signs are limited to one, single-faced, non-illuminated sign advertising the name of the winery and owner, and stating —Not Open to the Public. The sign face shall measure a maximum of six square feet in area and shall stand no higher than six feet from natural grade, as measured directly below the sign; and

17.52.060 Temporary Use Permit
E. Requirements for Approval
1. The following time limits for these specific temporary uses shall be the maximum allowed:
b. 30 Consecutive Days:
   (1) Grand opening signs (one time only per use).
   (2) Temporary signs and banners for schools, churches, and nonprofit organizations announcing special events, enrollment periods, and similar temporary activities. No more than two such temporary banners may be placed on the same parcel during a calendar year beginning January 1.
3.0 COMMENTS AND RESPONSES

Letter 8 Continued

Appendix D

SUBMITTAL FOR NOP

Cheryl Langley
5010 Mother Lode Drive
Shingle Springs, CA

Date: October 31, 2014

Anne Novotny, Senior Planner
El Dorado County Community Development Agency
Long Range Planning
2850 Fairlane Court, Placerville, CA 95667
Email: anne.novotny@edcgov.us

Subject: Notice of Preparation (NOP) for Proposed Sign Ordinance; File # 13-0086; OR12-0001

Ms. Novotny:

Thank you for the opportunity to comment on the proposed sign ordinance. The majority of the comments are related to the topic of aesthetics. Based on that concern, I request the following information be included in the draft Environmental Impact Report (dEIR) for the proposed sign ordinance.

RESEARCH / NEED FOR ORDINANCE REVISION

A. Please include an explanation of the need for the sign ordinance update. Identify the benefit of the revised ordinance, relative to the existing ordinance.

B. Discuss other sign ordinances (from other jurisdictions) examined prior to the development of this ordinance. Explain whether the El Dorado County (EDC) proposal is more or less restrictive in terms of anticipated sign installations. Identify areas that are more restrictive (in other jurisdictions) and the possible benefit of those restrictions.

C. Please provide in an appendix to the dEIR any public surveys that have been performed to determine the preferences of EDC residents regarding installation of the following:
   - Billboards (along Highway 50)
   - Digital signs
   - Mobile billboards
   - Signs installed within 100 feet of Highway 50
   - Off-site advertising (commercial messages)
   - Signs on wire along County roads
   - Signs along scenic/historic corridors
   - Illuminated signs

D. Please explain— if surveys have not been performed—how it was determined what sign types, etc., would/would not be allowed in EDC. That is, identify who contributed to the decision process (for the inclusion of digital signs, etc., for instance). Discuss whether the public was
3.0 COMMENTS AND RESPONSES

Letter 8 Continued

queried (via public outreach), other than during the brief draft review process. (The “final” draft document was released on a Friday for a Tuesday meeting; very little time for public review of a 40+ page rewrite of the draft.)

E. If surveys have not been performed, is it possible that they will be performed prior to project completion? (Outreach is important—most residents are probably unaware of County projects until they impact their daily lives; not the “fault” of County government, but a sound process anticipates impact and the amount of necessary outreach.)

F. Because individual/businesses have always been able to pursue the establishment of a sign under a Special Use Permit (SUP), please explain why this ordinance is necessary.

G. Explain how the proposed sign ordinance “enhances the visual appearance of the County” (Goal 2.7).

DIGITAL SIGNS

A. Discuss the need for digital signs in EDC.

B. Discuss what EDC public opinion is (specifically, that of residents) regarding digital sign displays.

C. Identify specific size requirements for digital signs, especially “free-standing” signs (i.e., those not in shop windows), including situations/circumstances under which specific sign sizes are allowed/unauthorized.

D. Explain why the following description is used to describe digital display areas: “Digital display is limited to 50 percent of the total allowable display face area of any particular sign.”

E. Discuss whether “large” off- or on-site digital billboards (such as those seen along Highway 50 in Sacramento County) will be allowed in EDC under this sign ordinance (including under an SUP, “nonconforming,” Variance, or other mechanism).

F. Explain why on- or off-site digital sign installations (advertisement for hire) are necessary for the conduct of business in EDC.

G. Identify any revenue EDC might receive if off-site digital billboards are allowed.

H. Explain why the “dwell time” was decreased from the first draft of the sign ordinance to the second draft. Describe who benefits from this change, and what public opinion is regarding the change.

BILBOARDS, GENERAL

A. Describe the feasibility of—and schedule for—eliminating established stationary off-site billboards (specifically those used for advertisement for hire).

B. Explain whether existing off-site commercial signage on private property (stationary and mobile billboards, specifically) will be removed from sites they currently occupy given the following ordinance language:

17.16.090 Prohibited Signs

A. General Prohibition. All off-site commercial signage on private property is prohibited unless as otherwise allowed in this Chapter. Existing off-site signs (e.g., billboards) are considered nonconforming signs as regulated by Section 17.16.100 (Illegal, Abandoned, and Nonconforming Signs).
3.0 COMMENTS AND RESPONSES

Letter 8 Continued

AND

17.16.100 Illegal, Abandoned, and Nonconforming Signs
(C)(1). Removal/Abatement. Any sign which becomes nonconforming as a result of the provisions of this Chapter shall be protected from removal by applicable provisions of state law and may be removed only as allowed by state law.

AND

17.16.090 Prohibited Signs
(B). The signs listed in this Section are prohibited in all zones. Except as otherwise specifically noted herein...

(B)(2). Billboards as defined herein. This does not prohibit relocation agreements as authorized by state law (California Business and Professions Code Section 5412.)

AND

17.16.110 Signs on County Property
(F) Relocation of Off-Site Billboards. Notwithstanding the prohibition on billboards in Section 17.16.090.B.2. pursuant to state law, the Board may approve agreements for relocation of existing billboards to County owned land.

MOBILE BILLBOARDS

Although ordinance language prohibits mobile billboards on rights-of-way, it appears conceivable that the County could see a proliferation of mobile billboards if the ordinance does not specifically exclude them from both rights-of-way and private property. (It is likely some landowners/leaseholders would be interested in allowing a mobile billboard on their property if paid “space rent” by the sign owner.)

Therefore, I request the following information:

A. Discuss whether any or all of the mobile billboards currently in place on private property in EDC will be removed following ordinance adoption. As much as it appears the proposed sign ordinance will prohibit mobile billboards, it seems equally as likely that there are caveats in the ordinance that will enable these displays to remain in place, or to be installed after the ordinance is adopted. Discuss the “will” of the County in this regard, and if the ordinance language accurately reflects this will.

B. Explain if mobile billboards that currently reside on private property are going to be allowed to remain in place following adoption of the proposed sign ordinance; discuss whether they will become “nonconforming signs” and thus “grandfathered” in. (Assuming they are not public health/safety hazards.)

C. Explain if mobile billboards must be granted SUPs to “qualify” as nonconforming signs prior to ordinance adoption. Discuss if SUPs have been granted to any of the mobile billboards photographed below, and if so, specify under what criteria/circumstances such permits were issued (under the current sign ordinance).

D. Discuss whether SUPs could be approved for any of the pictured mobile billboards following adoption of the new ordinance. If so, explain under what specific criteria/circumstances SUPs may be issued to mobile billboard installations on private property.
3.0 COMMENTS AND RESPONSES

Letter 8 Continued

E. Explain if mobile billboards may be classified as “temporary signs” and therefore allowed to remain in place under those criteria.

F. Explain if mobile billboards will be able to apply for (and likely to receive) approval to remain on private property via Variance agreements.

G. Discuss the possible/likely “fate” of each of the mobile billboards photographed below following sign ordinance adoption (assuming current draft language is approved).

“Community Event Sign.” Photo taken September, 2014; corner of South Shingle/Durock Roads.

Trucks bearing advertisements. Photo taken July, 2014; Cameron Park/eastbound Highway 50 onramp.
Letter 8 Continued

**Truck/trailer mounted advertisement.** Photo taken October, 2014; Bass Lake exit.

**Travel-trailer mounted advertisement.** Photo taken October, 2014; Durock Road.
3.0 COMMENTS AND RESPONSES

Letter 8 Continued

H. Discuss the value of changing current ordinance language to the following, with respect to stationary and mobile billboards. (This modification, as written, would likely eliminate the types of displays depicted in the photos—assuming “unless as otherwise allowed in the Chapter” includes only the ability to apply for SUPs/Variance, both of which require meeting specific criteria (yet to be specifically identified in the ordinance), public hearings, and approval.

From:

17.16.090 Prohibited Signs
A. General Prohibition. All off-site commercial signage on private property is prohibited unless as otherwise allowed in this Chapter. Existing off-site signs (e.g., billboards) are considered nonconforming signs as regulated by Section 17.16.100 (Illegal, Abandoned, and Nonconforming Signs).

To:

17.16.090 Prohibited Signs
A. General Prohibition. All off-site commercial signage on private property is prohibited unless as otherwise allowed in this Chapter. Existing off-site signs (e.g., billboards) are considered nonconforming signs as regulated by Section 17.16.100 (Illegal, Abandoned, and Nonconforming Signs).

AND

From:

17.16.090 Prohibited Signs
(B)(10) Mobile billboard advertising displays traversing upon or parked on a public right-of-way for the primary purpose of general advertising for hire.

(B)(12) Signs affixed to a structure or property not owned by the person installing the sign, unless authorized by the written consent of the owner of the structure or property. For the purposes of this provision, “owner” means any person or entity holding the immediate right of possession and control.

To:

(B)(10) Mobile billboard advertising displays attached to a vehicle or device that carries, pulls, or transports a sign or billboard for the primary purpose of advertising.

(B)(12) Signs or other advertising displays affixed to a structure or property not owned by the person installing the signs. For the purposes of this provision, “owner” means any person or entity holding the immediate right of possession and control.

HIGHWAY-ORIENTED SIGNS

17.16.040 Permanent Signs
(A) Permanent On-Site Signs.
(4) U.S. Highway 50-Oriented Signs. Signs on properties within 100 feet of U.S. Highway 50 that are outside of the designated State Scenic Highway Corridor.

A. 17.16.010 states that the ordinance will regulate “...the location, number and size of highway signs...” Explain how many highway-oriented signs are currently in LDC, and how many are expected to be installed following implementation of the ordinance.

B. Identify the scale of demand for this measure—the reason for its inclusion. (Identify the number of requests made for the installation of highway-oriented signs.)
Letter 8 Continued

C. Identify the efforts made to determine if residents are supportive of highway-oriented signs.

D. Discuss the need for this provision.

DEVELOPMENT STANDARDS FOR STATE SCENIC HIGHWAY CORRIDORS

A. Explain why a section of the ordinance is “Reserved for future Scenic Corridor Ordinance.” Is it anticipated that there will be sign installations along scenic corridors? Please include an explanation, including a discussion of the types of signs that may be allowed.

OFF-SITE SIGNS

17.16.040 Permanent Signs
(B) Permanent Off-Site Signs. Permanent off-site signs allowed in the County’s zoning districts include the following sign types:

(1) Subdivision Signs. Signs directing traffic to new residential subdivisions shall be consistent with the sign design and development standards as described in this Chapter and the following conditions:
(a) All signs for housing subdivisions shall be removed within 30 days after all lots in the subdivision are sold.

A. Explain why subdivision signs will be allowed off-site, and specifically where they will be allowed (the allowable distance from the subdivision, etc.)

B. Explain why signs will be allowed to remain until all lots in the subdivision are sold.

C. Identify how long such signs could remain (based on housing development sales information).

D. Identify what investigation has been done to determine the probable period of time signs are likely to remain.

E. Discuss the benefit of establishing a specific timeframe for sign display, rather than using sales information as the basis. For instance, allow signs for X number of months (unless all lots are sold prior to that timeframe). This approach would be much easier to enforce.

GAS PRICING SIGNS

17.16.030 Exemptions
A. Exempt Signs Without Limitations. The following signs are exempt from Sign Permit requirements with no specific limitations:

B. Gas pricing signs, as required by state law, which identify the brand, types, octane rating, etc., of gasoline for sale within the county (Sections 13530–13540 of the Business and Professional Code).

A. Explain why gas pricing signs are exempt from limitations.

ILLUMINATED SIGNS

A. Explain the necessity for illuminated signs (other than those illuminated to direct travelers to destinations or services).

B. Discuss whether EDC residents have been surveyed to determine which signs they believe should/should not be illuminated.
3.0 COMMENTS AND RESPONSES

Letter 8 Continued

COMMUNITY EVENT SIGNS (17.16.060[C])

A. Explain why “permanent” event pylon-style signs (established at a single site by the community) have not been proposed for communities wishing to display community events.

B. Explain who/how stationary community event pylon-style signs may be maintained (i.e., the local Chamber of Commerce, designated individuals within a community, etc.)

C. Discuss the advantages [especially in terms of community aesthetics] of maintaining a community event pylon-style sign for the display of community events, as opposed to allowing “street banners, signs, or other displays” to advertise such events (i.e., how a permanent pylon-style sign may eliminate sign clutter, and reduce the amount of dated material going to landfill).

TEMPORARY SIGNS

17.16.050 Temporary Signs
Temporary signs may include, but are not limited to, commercial signs for grand openings, products/services, sales, special events, and new apartments/multi-family units.

A. Time Duration. Display periods for temporary on-site signs shall be limited to a cumulative maximum of 90 days per establishment per calendar year, unless otherwise specified below.

A. Explain how it will be possible to enforce the Time Duration section of the ordinance for temporary signs—per sign/establishment/event—for the (probable) multitude of temporary signs posted countywide. Discuss who “sets the clock” per sign/establishment/event, and who will enforce this provision (realistically)?

CONSTRUCTION SIGNS

17.16.030 Exemptions

B. Exempt Signs With Limitations.

4. Signs on property undergoing construction or remodeling not exceeding 32 square feet each in area and limited to 1 sign for each street frontage. Such signs shall not be illuminated. Such signs shall be removed within 30 days of the earliest of the following events: final building inspection approval, issuance of a valid certificate of occupancy, opening for business to the public, or expiration of the Building Permit.

A. Explain why these signs are being allowed (I don’t believe they were allowed under the existing sign ordinance).

B. Identify who is going to determine whether these signs have remained past their 30 day allotted “stay,” and what penalties will be enforced (per day?) for those that remain over the 30 day time period.

C. Discuss whether this 30 day time limit will realistically be enforced, given the possible proliferation of these signs at every construction/remodel site in EDC.

D. Discuss why these signs are allowed to be as large as 32 square feet. Discuss whether a smaller size could be equally as effective (in terms of advertisement potential).
3.0 COMMENTS AND RESPONSES

Letter 8 Continued

CAMPAIGN / ELECTION SIGNS (POLITICAL CONTENT)

A. Describe the benefits of prohibiting campaign signs on public rights-of-way,* and the benefit of designating a particular area within a community for their display via a community pylon-style sign that lists the candidates/issues/debate dates (as opposed to allowing a proliferation of signs along County rights-of-way). Describe how limiting campaign/issue signs to specific areas might impact the following:

- Aesthetics (reduce visual clutter)
- Candidate/issue bias (via quantity of displays)
- The influence of dollars in campaigns
- Benefit candidates/issue proponents financially
- Reduce deliveries to landfill operations post-election
- Focus the electorate on the merit of candidates and issues

B. Describe innovative ways other counties in the State, or states with the nation, “handle” election signage.

*NOTE: Because unauthorized signs (this would include those in rights-of-way) are allowed to remain for 30 days under this ordinance, these signs can be posted in rights-of-way for that period of time, regardless of any other prohibitions.

UNAUTHORIZED SIGNS—DURATION OF STAY

A. Explain why the county is allowing a 30 day grace period for unauthorized signs. More than one respondent to an early draft of the proposed sign ordinance requested revision of this portion of the sign ordinance during the comment period for the July 8, 2013, draft. (Also see Cameron Park Design Review Committee comments of August 12, 2013, page 14.) Explain why the request for this adjustment to the text of the draft sign ordinance was ignored.

B. Explain why the current procedure for sign abatement will not be followed. (I believe the current procedure is for CE to remove a sign immediately upon receipt of complaint—lay it down if it is along a roadway, or remove it from a tree or telephone pole, if so posted—and place a notice on it that warns the owner that the sign will be removed and destroyed.) This seems like a reasonable procedure; explain why it is being changed.

C. Identify who “sets into motion” the 30 day clock on the abatement period for unauthorized signs (Code Enforcement [CE] via “patrols,” or the public via complaint).

D. Identify who verifies compliance following the 30 day abatement period, given the number of signs this may entail, especially if you include “signs on wire” along EDC rights-of-way, signs posted on telephone poles, trees, etc. (Suppose, for instance, 12 signs are posted on trees and telephone poles along Cedar Ravine, six are along Lotus Road, and five along South Shingle Road; who keeps track of when they were posted, and when they come down—realistically?)

E. Explain if this provision discourages the posting of unauthorized signs. (Thirty days is adequate time for most advertisers to “get their message out.”) Where is the disincentive to post?

STATE STANDARDS FOR REMOVAL OF NONCONFORMING SIGNS

A. Include in the DEIR a discussion of the “applicable provisions of state law” that protect nonconforming signs from removal, (17.16.100(C)(1)) and the state law “mechanism” that enables their removal.
B. Discuss how inclusion of the state law language in the text of the ordinance would make the ordinance more “user friendly” (accessible to those to whom the ordinance may apply).

**PENALTIES**

A. Explain why penalty language was removed from the ordinance and replaced with a reference to penalties in Chapter 9.02 of Title 9—Public Peace, Morals and Welfare.

B. Chapter 9.02 is currently under revision; discuss whether the penalty portion of the code will be revised. (See EDC Ordinance Code Recodification Project Legislative Draft Executive Summary, June 17, 2014.)

Because no penalty language has been specifically included in the ordinance, I request the following.

C. Explain why penalty information is not included in the ordinance, despite comment from the public. (The Cameron Park Design Review Committee also commented on this issue—see public comment submitted in response to the July 8, 2013, draft of the sign ordinance; page 2, Item 8, August 12, 2013.)

D. Explain why the only penalty language referenced in this ordinance is language that resides in a code that is currently under revision (Chapter 9.02 [Code Enforcement]).

E. Explain how revision of Chapter 9.02 may impact the penalty language currently in that code.

F. Explain who is primarily responsible for enforcing Chapter 9.02 in terms of safety issues along rights-of-way (i.e., EDC Sheriff’s Department, California Highway Patrol, CE).

G. Identify how adding penalty language to the current ordinance would improve ordinance clarity and “accessibility” to the public, and improve its “fairness” to those who may intentionally or inadvertently violate ordinance provisions.

H. Explain precisely how the penalties are to be levied: add the penalty formula.

There is also a problem with the penalty language in Chapter 9.02: While 9.02.050 does include penalties (provided the draft language does not change), it also includes what could be construed as an important “out” for enforcement authorities that are reluctant to enforce County code: “Informal oral or written requests to encourage compliance are encouraged, as are attempts to informally negotiate or mediate issues relating to compliance.” While the approach referred to in this section of the code is commendable—obviously a preferable way to solve the majority of violations—if it is used by County staff as a means to not enforce code (because staff may be uncomfortable with “push back” from businesses), this could mean removal of unauthorized signs will not be accomplished. After all, this language instructs/allows the enforcement authority to “encourage compliance.” It doesn’t indicate compliance is required post “encouragement.” As commendable—and sensible—as this portion of the code sounds, the language doesn’t indicate compliance is the endpoint.

I. Discuss the advantages of including penalty/enforcement language in Chapter 17.15 in terms of:
   - Making the penalty portion clear, easily accessible to the public.
   - Clarifying how the penalties are to be levied (by adding the penalty formula).
   - Clarifying who is responsible for enforcement activities.
   - Making clear that compliance is the endpoint of enforcement actions.
3.0 Comments and Responses

Letter 8 Continued

**CODE ENFORCEMENT**

In an email dated September 22, 2014, to the Board of Supervisors (et al.), Mr. Wassner, Supervising Code Enforcement Officer, indicated that the lack of resources in CE since 2008 has meant that CE has not been enforcing sign complaints unless they create a hazard by blocking a driver’s sight distance, and that “...penalties of the Administrative Citations should provide the funding” necessary to acquire “additional resources” to pursue violations. Therefore, please include the following information in the dEIR:

A. Identify how many staff are currently assigned to CE duties, and what their specific duties are.

B. Include an estimate of how many new staff (“resources”) will be necessary to implement the new ordinance, and how likely it is that such a staffing level will be achieved.

C. Identify how many violations per month would be necessary to support one full-time permanent staff person—and based on this estimate—discuss if this is a realistic approach to supporting additional staff.

D. Explain why this method of staff support—if deemed likely to support permanent staff—was not implemented prior to losing staff in 2008.

E. If additional staff cannot be acquired, discuss the alternative plan for the effective enforcement of the ordinance.

Also included in Mr. Wassner’s September 22, 2014, email was a statement that once the updated sign ordinance has been adopted, “we can educate the public regarding the requirements with newspaper articles.” Therefore, in the dEIR:

F. Include specifics (content/expected duration) of the public information campaign that is to be released after the sign ordinance is approved. Include in the draft EIR the public education campaign materials CE intends to “popularize” in its effort to help the public understand the new sign ordinance (newspaper article text, etc.)

G. Identify the time lapse for CE to begin enforcement activities following the proposed public education campaign (the specific time period that will be established as “a reasonable period for self-compliance,” also mentioned in Mr. Wassner’s email of September 22, 2014).

H. Discuss how, specifically, CE is going to enforce the new ordinance, once adopted. That is, discuss if CE is going to perform periodic patrols, or if identification of violators will be dependent upon complaints registered by the public. Because CE enforcement activities have been lacking in the past (Ellen Van Dyke made a comment to the effect that enforcement was inadequate in comments submitted July 15, 2013, as did Amy Anders, August 12, 2013), it makes residents wonder how enforcement will be different after the new ordinance is adopted. Please explain.

**SPECIAL USE PERMITS (SUP)**

17.16.080 Permit Requirements and Review Procedures

A. Sign Permit Required.

2. Sign Permit(s) shall be required as part of the review of any discretionary application that includes proposed signage. The Sign Permit shall be in addition to the discretionary application or permit.

   A. Include specifics (criteria) that signs (or other displays) must meet to be approved under the SUP process; include guidelines.
B. Discuss how the inclusion of a sunset clause for SUP approved displays may be beneficial; discuss why this clause has not been included.

VARIANCE

17.16.020 General Sign Requirements
G. Exceptions to Limitations. Any exception to the limitations and/or sign development standards stated or shown within this Chapter shall require a Variance in compliance with Chapter 17.22, Section 17.22.600 (Variance).

17.16.030 Exemptions
B. Exempt Signs With Limitations. Exempt signs that do not meet the limitations listed may be allowed only by Variance as outlined in Chapter 17.22, Section 17.22.600 (Variance).

A. Include specifics (criteria) that signs (or other displays) must meet to be approved under a Variance; include guidelines.

B. Discuss how the inclusion of a sunset clause for displays approved under a Variance may be beneficial; discuss why this clause has not been included.

SCOPE OF IMPACT

A. Include in an appendix to the dEIR any data EDC has on the anticipated impact of this ordinance (i.e., how many more—or less—of the specific sign types listed below are anticipated to be installed in EDC following ordinance adoption). Explain the number/type of signs expected to increase, or decrease.
   o Stationary and mobile billboards
   o Digital billboards (on- and off-site)
   o Signs installed within 100 feet of Highway 50
   o Off-site signs (general)
   o Signs on wire, telephone poles, trees, etc. adjacent to County roads
   o Signs along scenic/historic corridors
   o Illuminated signs

B. Include an estimate of the number of nonconforming signs in the County; discuss the benefit of removing nonconforming signs prior to ordinance adoption, and the aesthetic “cost” of not enforcing cleanup.

DEFINITIONS

A. Add to the definition section “Director.”

CONCLUSION

This ordinance raises concerns that more signage will be allowed in EDC, that the duration of stay for many sign types will increase, and that any “protective” provisions are not enforceable in practical terms. Consequently, this ordinance will have a significant adverse impact on County aesthetics.
Humans have radically transformed the physical characteristics of the nighttime hours in ways that would have been unimaginable only a hundred years ago *(Figure 1, Longcore and Rich 2004)*. The cost of industrial development, affluence, and mass consumption has been the loss of natural patterns of darkness over vast expanses of the Earth’s surface, both on land and at sea (Cinzano et al. 2001).

Those concerned with the nighttime environment, whether scientists or advocates, regulators or lighting manufacturers, in the private or public sector, together face the challenge of restoring the night sky and natural patterns of light and dark in a global economy. We are motivated by an affinity for the night sky (Mizon 2002), respect for our natural heritage, concern for our own health (Stevens and Rea 2001, Pauley 2004), and a desire to protect the night for the other living beings with which we share the planet.

Astronomers were the first to express concern about the widespread proliferation of artificial night lighting, and they rightfully raised the alarm about the degradation of the night sky (Riegel 1973). Concern about the effects of artificial lighting on wildlife and plants has been a relatively recent phenomenon (Verheijen 1985, Upgren 1996, Outen 1998). This is not to say that scientists were not interested in the effects of light on other species. Naturalist William Beebe was fascinated with the ability of ultraviolet lights to attract juvenile fish, as documented in a sketch from an expedition in 1935 *(Figure 2)*. But Beebe’s observations were not motivated by concern that lights had widespread ecological consequences.

A substantial and growing body of research on the ecological effects of artificial night lighting is now available (see Rich and Longcore 2006). New scientific articles that extend this knowledge are being published at a steady rate (e.g., Oro et al. 2005, Baker and Richardson 2006, Miller 2006). Sufficient information is now available to devise policies to mitigate and avoid the range of profound, adverse consequences on other species.
Lights that kill

Anyone with a porch light knows that lights can kill. Many insects are attracted to their deaths at lights; in Germany alone, the estimate of total insect deaths at streetlights in a summer is 100 billion (Eisenbeis 2006).

Migratory birds are attracted to the lights on tall towers when weather conditions are adverse. In North America, an estimated 4–5 million birds are killed per year in collisions with towers, their guy wires, and each other. Most of these are Neotropical migrants, birds that migrate to Central and South America, which are already under severe population stress (Banks 1979, Shire et al. 2000, Longcore et al. 2007). Based on past patterns, we have calculated that two species of federal conservation concern, blackpoll warbler and bay-breasted warbler, suffer losses of over 100,000 individuals each year (Longcore et al. 2007). Over 10,000 individuals of an additional 20 species of conservation concern are killed annually. A change in lighting type would probably eliminate up to 80% of this mortality (Gehring and Kerlinger 2007), and the U.S. Federal Communications Commission is considering such a change based on expert testimony from us, other groups, and the U.S. Fish and Wildlife Service.

Although they are not afforded the same attention as birds, the mortality of insects can be significant. In a study along a forested stream, a single streetlight installed on the bank attracted and killed as many caddisflies as emerged from the stream along an entire 200 meter stretch (Scheibe 1999). This process is described by Professor Gerhard Eisenbeis as the “vacuum cleaner effect,” vividly evoking the image of lights sucking insects out of their natural habitat (Eisenbeis 2006).

Beachfront lighting and sky glow threaten the survival of hatching sea turtles and affect the nest site choice of female turtles (Witherington 1992, Salmon et al. 2000).
Letter 8 Continued

Hatchlings are disoriented by light and fail to make their way to the ocean and out to sea. This problem was identified first in the 1960s (MacFarlane 1963) and many programs have been put in place to control beachfront lighting (Salmon 2006).

Interference with reproduction

Even when lights do not kill wildlife, they can interrupt important behaviors such as those associated with reproduction. For example, stray light can wash out the visual messages between male and female fireflies (Lloyd 2006).

In a recently published article, two Canadian researchers investigated the effects of intermittent light on the reproductive behavior of northern green frogs (Baker and Richardson 2006). They counted the number of calls by males to attract mates under natural ambient darkness and under the light of a flashlight shined on them. This simulates the effects of a security light on a motion detector or the flash of lights from a passing car. The results show a significant 44% decrease in the number of calls and a 675% increase in the number of moves made by individuals (Baker and Richardson 2006).

Under different circumstances, extra light causes species to expend energy calling at night. In another recent article, current and historic singing records for American robins were used to show that males sing well before dawn only in those locations with high light levels (Miller 2006). Subsequent research on European robins concluded that daytime noise is a more important predictor of nighttime singing, although locations where birds sang at night were on average brighter than areas where birds did not sing at night (Fuller et al. 2007). Our analysis of the data reported by Fuller et al. (2007) suggests a threshold effect where increased illumination allows nocturnal singing in noisy locations; no birds sang at night at any of the darkest 20% of locations, even if the location was noisy during the day.

The effects of lighting can extend to the ocean. Seabirds are attracted to and incinerated at flares at oil platforms, migratory birds are killed running into cruise ships, and lighted squid boats each shine 30,000 Watts into the ocean (Montevoci 2006). But even sky glow at the level of the full moon could easily disrupt the tightly synchronized spawning of corals. Under normal lunar cycles the release of coral larvae, also known as planula, always follows the new moon, presumably to reduce predation on these larvae. This synchronization breaks down in experiments where corals are subjected to perpetual full moon illumination (Jokiel et al. 1985).

Figure 3. Ecological and astronomical light pollution is caused by lights at night. Figure reprinted from Longcore and Rich (2004).
Letter 8 Continued

Predators, prey, and night light.

Lights at night also disrupt ecological interactions. Predator–prey interactions are particularly vulnerable to influence by lighting. In general, additional light benefits the predator, except when the prey are found in groups where individuals warn each other of predators, such as flocks of birds and schools of fish (Longcore and Rich 2004). But examples of lights increasing nocturnal predation are many.

In a study of European storm-petrel nests in caves on an island off the coast of Spain, the birds in the cave illuminated by city lights were killed far more often by gulls than those in the cave facing away from the city (Oro et al. 2005). In addition, bird survival decreased after completion of a major lighting project in the city, declining significantly in the years that followed (Oro et al. 2005). In a separate study of black-vented shearwaters, another seabird, nesting birds were predated far more in the light of the full moon than the dark of the new moon, again by gulls (Keitt et al. 2004).

Young salmon, known as salmon fry, migrate from the streams where they hatch to the ocean. They migrate en masse at night, fueled by illumination levels, and this timing is designed to reduce predation. Researchers in the Pacific Northwest documented harbor seals positioning themselves under lights on a bridge to locate and capture the outmigrating fry (Yurek and Trutes 2000). When they turned off the lights, predation levels declined at first but then increased as the seals relocated under other lights from the town. They were found eating salmon fry under the lights of a ball field, a sawmill, and other urban glow (Yurek and Trutes 2000).

A recent study from Florida showed alteration in the foraging behavior of beach mice under night lighting (Bird et al. 2004). Some species of these small rodents are federally endangered and they are an important part of the coastal dune ecosystem. The research found that beach mice reduced the proportion of bait stations they visited closer to lights. In addition, this pattern was found for both low-pressure sodium vapor lights, which are generally considered to have fewer environmental impacts because they are less attractive to insects, and for yellow “bug lights,” which are also promoted as being turtle-friendly and mandated for this reason (Bird et al. 2004). In this example, we see that lights that reduce impacts for one species are not necessarily benign for others.

Nature needs the night

Our question, from this ecological perspective, is whether the international community is up to the challenge of restoring the night. The geographic scope is great, extending throughout the world from urban lights, roadway lights, tower lighting, light-induced fisheries, offshore oil production, and many other sources (Longcore and Rich 2004).

The range of species is also great, extending across all major taxonomic groups and habitats. Any species that evolved with natural patterns of light and dark is potentially susceptible to adverse effects of artificial lighting. Direct glare, sky glow, and steady and intermittent lights from urban to rural environments, both on land and at sea, all alter the nighttime environment, causing both ecological and astronomical light pollution (Longcore and Rich 2004).

Unfortunately, there is no one-size-fits-all solution to mitigate the effects of artificial night lighting on nature. Some species are sensitive to yellow light, others to blue.
As we have seen, artificial lights still disrupt foraging of endangered beach mice (Bird et al. 2004). Attraction of migratory birds to tall towers can be reduced by using flashing lights (Gauthreaux and Belser 2006), while flashing lights in other contexts would be detrimental. Effective solutions will be place- and habitat-specific, such as a road in Florida where lights that attract turtles were replaced by LED lights embedded in the pavement (Figure 4, Salmon 2006). Our message is simple. Nature needs the night. Substantial progress has been made in understanding the many effects of light on other species and indeed on humans as well. We hope that readers will put this knowledge to work — as researchers, as advocates, as regulators, and as informed citizens.

Notes and References
3.0 COMMENTS AND RESPONSES


Contact
The Urban Wildlands Group. P.O. Box 24020, Los Angeles, California 90024-0020, USA.
Letter 8 Continued

The Guardian
Alok Jha, Science Correspondent

Streetlights threaten survival of bats

Woodland bat species avoid bright lights and may go hungry or get picked off by falcons or hawks as a result.

Woodland bats only come out into the light if they're starving. Photograph: Christopher Thom and Hugo Wilcox/Getty

If you want bats to thrive, turn off your streetlights. Scientists have found that woodland bats will do anything to avoid lights when foraging at night, even if it means finding less food or being exposed to predators.

"If the bats come out in the daytime, they get picked off very easily—in those situations, their vision isn't good enough to pick up predators," said Gareth Jones of Bristol University. "So they've got hard-wired aversion to light and try to avoid it wherever possible. They only come out in the light if they're starving, if they have to. Indeed, predator avoidance is probably the main reason why bats are nocturnal."

To test the effect that streetlights have on bats, Bristol University graduate student Emma Stone placed lights that mimicked streetlamps along the commuting routes of woodland bats at eight different sites. These routes are used by the animals to fly between roosting and foraging sites.

"As soon as the lights came on, there was a significant decrease in the number of bats using the routes," said Jones.

Being forced to take detours could mean that the bats end up in worse feeding grounds or having to fly longer to find what they need. The alternative routes taken by the bats could also provide less shelter, exposing the animals to greater risk of attack by falcons or hawks.
Letter 8 Continued

Previous research has shown that some species are, in fact, attracted to lights. "Especially white mercury vapour lamps that emit a lot of ultraviolet light that attracts insects, the bats come in and feed in the insects," said Jones. "But these are fast-flying bats that fly out in the open. The bats that feed in woodland seem to be light averse and these are the species that usually fly very slowly and are the ones most vulnerable to predation."

In their paper, published tomorrow in Current Biology, the researchers pointed out that light pollution was rarely considered in conservation plans, and street lighting is excluded from English and Welsh light pollution laws. "This study provides evidence that light pollution may force bats to use suboptimal flight routes and potentially causes isolation of preferred foraging sites, and therefore must be considered when developing conservation policy," they wrote.

Stone said compromises should be possible. "We really need to know what levels of lighting particular bat species can tolerate, and mitigate appropriately," she said. That could include directing light away from important flight routes or shielding the light in some way.
3.0 COMMENTS AND RESPONSES

IMPACT OF LIGHTING ON BATS

Demand for floodlighting has increased in recent years. Glowing night skies are rapidly replacing dark, starry skies. Buildings (including many churches) are being illuminated for aesthetic reasons. Previously dark rural locations are being lit up with increasing need for security on private and public property. Lighting is used along roads between towns, on bridges and on sport complexes. Excessive lighting not only causes light pollution and wastes energy but also impacts on the natural environment by affecting the activity rhythms of both plants and animals (Outen 1998).

All bat species are nocturnal, resting in dark conditions in the day and emerging at night to feed. Many species of bats are known to sample the light levels before emerging from their roost; only emerging for their night’s hunting when the light intensity outside reaches a critical level after sunset (Swift 1980). Floodlighting disrupts the normal 24-hour pattern of light and dark which is likely to affect the natural behaviour of bats. Light near a roost access point will delay bats from emerging and shorten the amount of time available to them for foraging. Bright light may reduce social flight activity and cause bats to move away from the light area to an alternative dark area. Illuminating a bat roost creates disturbance and may cause the bats to desert the roost.

Due to the decline in bat numbers, all species of bat are protected by the Wildlife & Countryside Act (1981) and the Conservation (Natural Habitats etc.) Regulations 1994. This makes it illegal to: kill, injure, capture or disturb bats, obstruct access to bat roosts or damage/destroy bat roosts. Lighting in the vicinity of a bat roost causing disturbance could constitute an offence, unless English Nature has been consulted and allowed time to provide advice.

In addition to causing disturbance to bats in the roost, artificial lighting can also affect the feeding behaviour of bats. In most bat species there is an evening period of activity followed by another at dawn. These two flights correlate with the peak flight times of nocturnal insect prey. Insects are attracted to light particularly if it is a single light source in a dark area.

A range of lighting equipment is available with three basic types of street lamps used.
1) Low pressure sodium lights (typical yellow lamps seen along roadsides). Light is emitted at one wavelength, contains no ultraviolet (UV) light and has a low attraction to insects.
2) High pressure sodium lamps (brighter pinkish-yellow lamps). Light is emitted over a broad band of long wavelengths. Insects are attracted to the brighter light which are preyed on by some species of bat.
3) Mercury lamps (bluish-white lamps). These emit light over a very broad spectrum including UV light to which insects are particularly sensitive. Insects are attracted in large numbers along with high densities of bat species particularly of the genera Nyctalus, Eptesicus and Pipistrellus. (Rydell & Racey 1993)

Studies have shown that, although noctules, Leisler’s, serotine and pipistrelle bats swarm around white mercury street lights feeding on the insects, this behaviour is not true for all bat species. The slower flying broad winged species such as Plecotus, Myotis and the Rhinolophus species avoid street lights. In an important bat site in Suffolk, numbers of Natterer’s, whiskered, Daubenton’s and brown long-eared bats fell following the installation of street lamps nearby.

Artificial lighting can increase the chances of predation. It is believed that Plecotus and Myotis species shun bright light as a predator avoidance strategy. Many avian predators will hunt bats,
which may be one reason why, on a nightly basis, observations have been made of kestrels (diurnal raptors) hunting at night under the artificial light along motorways.

Floodlighting will deter bats from using their usual foraging areas. Lighting can be particularly harmful if used along river corridors, near woodland edges and near hedgerows used by bats. Studies have shown that continuous lighting along roads creates barriers which bats cannot cross. For example, Daubenton's bats move their flight paths to avoid street lamps. In Europe, in areas where there are foraging bats, stretches of road are left unlit to avoid isolation of bat colonies.

Small-scale lighting needs no planning permission and depends on direct advice being given to the householder. Lighting associated with new development or a listed building does require planning permission. Planning officers or Developers when dealing with applications for floodlighting in an area of suitable bat habitat (eg. woodland, old pasture, linking hedgerows and water habitats) should ensure the local bat group is consulted for any information on bat roosts in the area. If bat roosts are suspected, it may be necessary to conduct a bat survey. A survey may need to determine the species of bat affected, their population levels, the likely impact of the lighting on the bats and possible mitigation.

The need to install lighting should be questioned. Where lighting impacts on the local bat population, the benefits from the lighting installation should outweigh the needs of the local bat population. Where lighting is permitted, as may be necessary for public safety, conditions should be imposed to ensure the impact of the lighting on the bats is kept to a minimum.

The impact on bats can be minimised by: the use of low pressure sodium lamps instead of high pressure sodium or mercury lamps, mercury lamps used should be fitted with UV filters, the brightness should be as low as legally possible, the times during which the lighting can be used should be limited to provide some dark periods and the lighting should be directed to where it is needed to avoid light spillage. Any upward lighting should be minimal to avoid light pollution. Light can be restricted to selected areas by fitting hoods which direct the light below the horizontal plane, at preferably an angle less than 70 degrees. Limiting the height of lighting columns and directing light at a low level reduces the ecological impact of the light. Road or trackways in areas important for foraging bats should contain stretches left unlit to avoid isolation of bat colonies.

No bat roost (including access points) should be directly illuminated. If it considered necessary to illuminate a building known to be used by roosting bats, the lights will need to be switched on at bat emergence time and during peak bat activity times. During the months May - September a bat roost should not be illuminated outside after 8.30pm. Lighting of buildings should be limited to special occasions.

References
The Institution of Lighting Engineers (1992) Guidance Notes for the Reduction of Light Pollution

These guidelines were compiled by Dr Jenny Jones May 2000
3.0 COMMENTS AND RESPONSES

Letter 8 Continued

A Review of the Impact of Artificial Light on Invertebrates

Charlotte Bruce-White and Matt Shardlow

2011

Putting the backbone into invertebrate conservation
Letter 8 Continued

A Review of the Impact of Artificial Light on Invertebrates

Charlotte Bruce-White and Matt Shardlow
2011

March 2011


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A Review of the Impact of Artificial Light on Invertebrates

Charlotte Bruce-White and Matt Shardlow

2011

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1.0 Executive summary

This report reviews the available literature on how humans are changing the light environment and the impact that this has on insects and other invertebrates, makes recommendations and identifies several further research areas.

1.1 Conclusions

1. Developments in lighting technology have led to major increases in the distribution and intensity of artificial light in the past few decades and its growth is continuing largely unchecked.

2. Artificial light has the potential to significantly disrupt ecosystems and it has long been of concern to conservationists. It is widely observed that some invertebrates, such as moths, are attracted to artificial lights at night. In addition the polarisation of light by shiny surfaces is a significant problem as it attracts aquatic insects, particularly egg laying females, away from water, and reflected light has the potential to attract pollinators and impact on their populations, predators and pollination rates.

3. Artificial light can significantly disrupt the natural light/dark patterns. Many invertebrates depend on the natural rhythms of day-night and seasonal and lunar changes to light levels. As a result artificial lighting has several negative impacts on a wide range of invertebrates including disrupting their feeding, breeding and movement which may reduce and fragment populations.

4. Invertebrates make up the majority of biodiversity on earth and are vital to ecosystems. Many invertebrates are also listed as national priority species for conservation under the UK Biodiversity Action Plan (BAP). It is therefore important to minimise the impacts of artificial light on invertebrate populations.

5. Action to reduce artificial light impacts is necessary and justified now. Although further research is required to fully understand the impacts of artificial light on invertebrates and the environment as a whole, the precautionary principle applies and enough is known to take action now. This report makes several recommendations that would reduce and mitigate the negative effects that artificial light has on invertebrates.

1.2 Recommendations

1. Lighting should be kept to a functional minimum in all areas. Better designed lighting, in the right places and at the right times is needed rather than just increasing the amount and brightness of artificial light at night. Those involved in planning lighting schemes should always assess whether lighting is necessary and whether alternative solutions are available. If lighting is deemed necessary then it should be used only where and when it is needed. The number of lights and brightness/wattage should be kept to a minimum and, to avoid light spillage, lamps should not emit light at angles greater than 70°.
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2. Lights that emit a broad spectrum of light with a high UV component should be avoided. The majority of insects and other invertebrates are most sensitive and responsive to the short wavelength end of the light spectrum.

3. Some locations are particularly sensitive to light pollution and lighting schemes in these areas should be carefully planned to avoid negatively affecting invertebrates and the environment. In particular, lighting should not be installed near ponds, lakes, rivers and the sea; areas of high conservation value; sites supporting particularly light-sensitive species of conservation significance (e.g. Glow worms and rare moths) and habitat used by protected species of invertebrate.

4. Areas with natural or near-natural lighting regimes should be officially conserved. Additional Dark Sky Preserve areas should be identified to complement the Galloway Forest Park Dark Sky Preserve. In these areas existing light pollution should be reduced and strict limits and constraints placed on any new lighting. New lighting in natural cave systems should not be permitted and lighting in show caves should be minimised.

5. Light pollution from domestic security lighting would be reduced through awareness raising. Many members of the public are not fully aware of the environmental impacts of lighting. Information on lighting types, installation and maintenance should be given before purchase to reduce the impact of these domestic lights. Retailers selling domestic security lighting should be properly trained and informed on the issues.

6. Sources of polarised light pollution should be identified and reduced. Light creation is not the only form of artificial light pollution. Artificial surfaces that reflect polarised light are attractive to aquatic insects. Insects attracted to hot dry surfaces can suffer a high mortality or undertake futile egg-laying. The use of agricultural sheeting in sensitive areas, particularly near open water, should be halted, or non-polarizing sheeting should be used where necessary. Car parks should be located far enough away from rivers and other waterbodies so that aquatic insects are not attracted to the cars for egg-laying. Asphalt road surfaces near waterbodies should be made non-polarising by incorporating a rough top layer or white granules that scatter light. New buildings should not include glass that produces horizontally polarised light. Solar panels should include a pattern of roughened or painted glass or a horizontal light blocking grid so that they are no longer attractive to aquatic invertebrates.

7. Structures in the countryside, particularly in perilous situations such as wind farms, should not be painted with colours that attract insects. Pollinating insects are attracted to surfaces of particular colours. Large structures painted yellow, white or pale grey are likely to divert pollinators away from flowers and also attract their predators. In the case of wind turbines this is likely to result in an increased mortality of insects, birds and bats.

8. The potential impacts of light pollution on wildlife should be a routine consideration in the Environmental Impact Assessment process. Risks should be eliminated or minimised wherever possible.
2.0 Aims and objectives

The aims for this report are to:

- Review the available literature on the impact of artificial emitted, polarised and reflected light on insects and other invertebrates and identify further research needed to address any knowledge gaps.
- Make recommendations to minimise any impacts of artificial light on invertebrates and develop a strategy for influencing planners, engineers and other stakeholders in their choice of lighting equipment and other materials.
- Raise awareness of the negative effects that artificial light poses to invertebrates and other wildlife.

3.0 Introduction

Humans have long been producing and manipulating light. Up until about 150 years ago all artificial light was produced by burning substances such as wood, candles, oil and gas. These are combustion-based forms of lighting that emit a broad spectrum of light but are very inefficient. The introduction of the electric filament lamp in the mid-19th century caused a revolution in lighting, allowing much brighter, more efficient light to be produced. Incandescent forms of lighting remained dominant until the 1930s but fluorescent lighting started to become more widespread in post-war Britain.

The dramatic development of lighting technology in recent decades has led to a massive increase in outdoor lighting both in Britain and on a global scale. The distribution and intensity of artificial lighting continues to increase with the growth in worldwide development. Urban and rural development brings with it road, security and amenity lighting that results in a significant change in the natural patterns of day and night in the environment. Associated artificial surfaces can polarise or reflect significant amounts of sunlight. These factors have created more direct exposure of wildlife to artificial light.

Concern about the impacts of artificial lighting on the environment have been growing in recent years and was recently summarised in the 2009 Royal Commission on Environmental Pollution report on Artificial Light in the Environment.

Artificial lighting has the potential to significantly disrupt ecosystems and it has long been of concern to conservationists¹. The negative effects that lighting has on vertebrate animals, such as migrating birds, nesting sea turtles and bats have been well documented³⁻⁴⁻⁵⁻⁶⁻⁷⁻⁸⁻⁹⁻¹⁰⁻¹¹⁻¹². However, despite almost universal awareness that electric

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lighting disturbs nocturnal invertebrates, little substantial scientific research has been conducted to assess the nature of these effects on nocturnal invertebrates.

Invertebrates are animals that don’t possess a backbone (vertebral column) and include everything from sponges (Porifera), jellyfish (Cnidaria), flatworms (Platyhelminthes), crustaceans, insects and spiders (Arthropoda) and snails (Mollusca). Invertebrates make up the majority of living species; they are hugely diverse and abundant and are vital to ecosystems\(^5\). Therefore it is important to understand and quantify the effects that artificial light has on invertebrate populations in order to assess the overall impacts on the ecosystems.

3.1 Light detection by invertebrates

Most animals are sensitive to light, and nearly all have some form of identifiable photoreceptors (light sensors). In the invertebrates there is a huge range in the complexity and capability of light-sensitive structures which range from simple nerve fibres of some sea urchins that respond to changes in light levels, to the complex compound eye of insects that detects light and is able to form images and the sophisticated eyes of jumping spiders that are able to focus images. Arthropods, molluscs and some worms have eyes that are extremely sensitive and they are perhaps most affected by changes in light.

Light and darkness are a major environmental influence in the lives of many animals, including invertebrates. Arthropods such as insects and crustaceans have compound eyes that are sensitive to a broad range of light. Most insects have a colour vision system that is based on three or four, sometimes five, types of colour receptor cells. Light wavelengths are measured in nanometres (nm) and most insects can perceive the spectral region from ultraviolet (UV) which has a short wavelength and high frequency (300 nm) to red which has a long wavelength and a low frequency (700 nm)\(^7\). UV light is used by terrestrial invertebrates in a variety of activities such as mate selection, navigation and foraging\(^7\). UV, green and blue light which have short wavelengths and high frequencies are best discriminated by insects, they are often much more sensitive to these wavelengths than humans are; while insects are generally insensitive to the red end of the spectrum. However, it is believed that some aquatic insects are more sensitive to red light than other invertebrates as it penetrates an unpolluted water column further than light with a shorter wavelength\(^6\). Some biting flies are also known to see infrared (>700nm) emitted from warm-blooded animals;

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however in general insects are most strongly attracted to UV light and are least attracted to red light\textsuperscript{9}.

Some invertebrates can detect light at very low levels. For example nocturnal hawkmoths have large and sensitive superposition compound eyes. Their sensitive eyes allow them to see in colour even at very low light intensities that are roughly equivalent to starlight. Like humans, other insects with apposition eyes, such as bees, become colour-blind in dim light\textsuperscript{10}.

3.2 Light and invertebrate life-cycles

Many invertebrates depend on the natural rhythms of day–night and on seasonal and lunar changes in light levels to trigger vital stages in their life-cycles such as oviposition (egg-laying), emergence and diapause (hibernation). For example, some species of insects complete their lifecycle within a lunar cycle of 28 days. The presence or absence of moonlight provides a trigger for the beginning or end of each lifecycle. Some insects such as flying adult mayflies can become disoriented by artificial light and fail to successfully perform important aspects of their life-cycle\textsuperscript{11}. It is likely that such disruption to essential life events would lead to local extinctions of species and a reduction in abundance and biodiversity.

4.0 Methodology

This report presents an overview of the impact of artificial night lighting on invertebrates. There has been anecdotal evidence about the deleterious effects of light pollution on invertebrates for many decades, but surprisingly little scientific data on the actual effects on species and populations exists. The majority of literature focuses on the effects of emitted light on night flying invertebrates, particularly moths. Literature on other groups of invertebrates and on polarised and reflected light is patchy. Although ‘hard’ data is limited, this report reviews a wide cross-section of available relevant literature and identifies where additional research is required. The literature used as supporting evidence in this report was found using web-based searches and from contacts with specific expertise. Most of the literature cited is from peer-reviewed publications providing a diverse selection of literature for the report. Both international and UK-based sources were utilised. The research in this report focuses predominantly on invertebrates but research on the effects of artificial light on other wildlife was also reviewed.

5.0 Potential impact on invertebrates

5.1 Attraction to artificial light

5.1.1 Attraction to emitted light

One of the most obvious effects of artificial lighting is that it attracts many nocturnal insects and some other invertebrates. Lighting attracts large numbers of a wide range of invertebrates but moths are perhaps best known for this behaviour. Other groups drawn to artificial lights include beetles, lacewings, aphids, caddisflies, crane-flies, midges, hoverflies, true flies, scorpionflies, damselflies and dragonflies, termites, butterflies, some diurnal jumping spiders, ant-lions, bush crickets and wasps. UV, green and blue light which have short wavelengths and high frequencies are best discriminated by most insects and are highly attractive to them. Consequently, lights that emit little or no UV such as low pressure sodium lamps are least attractive to insects.

The distance that invertebrates are attracted to light varies greatly depending on other environmental factors and on the species. Moths are known to fly to light from distances varying from 3 to 130 m, but greater distances up to 500 m have been observed and this may not be the upper limit. Attraction to artificial light has been utilised by entomologists for centuries as a way to survey and monitor moth and other invertebrate populations. Moth trapping is usually undertaken in a responsible manner. Many trappers will not run their traps in the same area on consecutive nights, in case the artificial light affects moth breeding and feeding behaviour.

However, experiments conducted in Finland indicated that even the minimal amount of disturbance caused by moth traps could still lead to local extinctions of moths that have a very small population.

It is estimated that as many as a third of flying insects that are attracted to street lights will die as

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3.0 COMMENTS AND RESPONSES

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a result\textsuperscript{18}. Insects can die or become injured when they collide with a hot lamp or they can become disorientated and exhausted making them more susceptible to predation. In some instances huge numbers of dead moths have been observed around outdoor lighting\textsuperscript{19}. Certain species of fast-flying bats such as the Noctule (Nyctalus noctula) and Common pipistrelle (Pipistrellus pipistrellus) are known to feed on large numbers of insects that have been attracted to night lighting\textsuperscript{20}.\textsuperscript{21} It has also been found that mercury vapour streetlights increase bat predation on moths because the lights interfere with the ability of moths to detect the ultrasonic sound bursts used by bats to locate prey\textsuperscript{22}.

Artificial lighting attracts other predators too. Moths and other invertebrates attracted to night lighting often rest on surfaces close to the light source during the day. Many invertebrate species use camouflage, but they may end up resting on an unsuitable background making them clearly visible to predators. It has been noted that birds soon learn to hunt for invertebrates resting on surfaces close to artificial light and amphibians and reptiles in some tropical areas will sit and wait to prey on invertebrates attracted to light\textsuperscript{23}. It is thought that even Common toads (Bufo bufo) in Britain sometimes prey on flying insects attracted to street lamps at night\textsuperscript{24}. Some nocturnal mammals such as hedgehogs and shrews will also eat invertebrates attracted to artificial lights\textsuperscript{25}. The Bridge orbweaver (Larinioides salticus) has an inborn preference to build its webs near artificial light. This behaviour might originate from the spiders favouring hunting grounds near to water bodies which reflect moonlight\textsuperscript{26}. This spider and several commoner spider species are able to take advantage of the attraction of flying insects to artificial lighting for their food supply.

Increased predation is not the only effect that attraction to artificial lighting has on invertebrates. Lighting can affect moths in many ways; it can disturb their flight, navigation, vision, migration, dispersal, egg-laying, mating, feeding and camouflage\textsuperscript{27}. The combination of such wide-ranging effects could have a considerable impact. Two thirds of the 337 moth species with sufficient monitoring data to determine the population trend in Britain have decreased over the last 35 years. Light pollution has been identified as a possible contributing factor for the observed declines. However, it is difficult to separate the impacts of artificial lighting from other impacts of urban development such as loss of habitat and air pollution\textsuperscript{28}. Further research is required to fully evaluate the problem.

Aquatic invertebrates are also influenced by artificial lighting. Riverflies are one of the most prominent of all the invertebrate groups affected. Riverflies include three orders of freshwater insects; stoneflies (Plecoptera), caddisflies (Trichoptera) and

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mayflies (Ephemeroptera). Riverflies and other aquatic invertebrates are a vital part of the freshwater ecosystem and are an important food source for birds, fish and other animals. It appears that the increasing intensity and distribution of lights across Britain is affecting riverfly breeding and survival27. Many riverflies depend on specific environmental cues for adult emergence and artificial lighting can interfere with these crucial cues. The larvae are generally repelled by light1 but adult riverflies are attracted to artificial night lights and could become disoriented around them29. There are numerous incidents of high mortality of riverflies around light sources close to riverbanks. Such incidents have the potential to lure sufficient numbers of adult riverflies away from the water to cause population declines27.

Outside of the UK other species of freshwater invertebrates are known to be affected by artificial light. Populations of the Giant water bug (Lethocerus deyrollei) have declined dramatically in Korea and it has been designated as an endangered species by the Korean Ministry of Environment. The Giant water bug and other insects belonging to the genus Lethocerus are known to be attracted in large numbers to street lights during night dispersion flights. In artificially lit areas without water the Giant water bug can then die of dehydration. A study on Jeju Island found that artificial light sources might be critical in determining where Giant water bugs live in the landscape. In particular, it is speculated that the presence of artificial lights within a 1 km radius reduces the probability of inhabitation29.

Many types of marine invertebrate, such as late-stage crab larvae, are attracted to artificial light30. Lights from the shore, boats and gas flares could disrupt marine invertebrates in the performance of activities vital to their life-cycles, such as feeding and breeding and make them more susceptible to predation. These invertebrates are important to the marine food chain and lighting around marinas and the shore must be minimised.

Electrocucting insect traps use light attraction to kill insects. They are widely used in food handling areas, and to some degree in homes, to control or eliminate unwanted flies. The traps contain a visual attractant, usually a UV bulb, and a high-voltage metal grid. Upon contact with the grid the insects are disintegrated by the high voltage. Scientific studies have shown that the disintegration of the fly results in the release of bacteria and viruses that were safely inside the fly, and hence present a likely increased risk of disease transmission to humans – directly and via foodstuffs. As a result glue board traps have been developed that operate at a lower voltage and stun the insect so that it falls onto a glue board and dies. We were unable to identify any research linking the use or efficacy of any electric insect traps to changes in population levels of insects or the killing of wild insects. It is very unlikely that indoor traps would damage the environment as they are generally placed in areas that are already fairly sterile and only a small fraction of the insect fauna is attracted indoors where they would be vulnerable. However, some traps are placed in stables and other more rural locations; there is some potential for these to affect wild insect populations, particularly if they are left running at night in an unenclosed space. We are aware of at least one instance of large electrocuting traps being placed outdoors

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— to control mosquito populations at a sewage works. It seems almost inevitable that if these traps are effective in their desired objective of controlling populations of mosquitoes, they will also cause damage to local populations of a wide range of nocturnal insects.

5.1.2 Attraction to polarised light
Polarised light pollution sources are also attractive to many invertebrates, including beetles, dragonflies and adult riverflies. Polarised light pollution is the process whereby light undergoes linear polarisation by reflecting off smooth surfaces or by scattering in the atmosphere or under water. Artificial lights are not necessarily part of this form of light pollution, but artificial lighting can make the situation worse.

Adult mayflies are attracted to sources of polarised light as in nature they indicate a water surface on which the insects can breed and lay eggs. Artificial sources of polarised light such as smooth dark building, cars, road surfaces and solar panels can attract mayflies in the same way; however, any eggs laid on such surfaces will not develop\textsuperscript{31}. There are a total of 278 species of mayfly, stonefly and caddisfly in Britain, eight of which are UK Biodiversity Action Plan (UKBAP) priority species for conservation action. All but the most polluted rivers in Britain support mayfly populations, therefore artificial lighting and sources of polarised light pollution around all rivers should be minimised\textsuperscript{32}.

Other freshwater invertebrates are also attracted to artificial light, including aquatic beetles\textsuperscript{33}. The Lesser silver water beetle (Hydrochera caraboides) is known to be attracted to polarised light pollution sources\textsuperscript{34}. It is a UKBAP species, classed as endangered in Britain and is fully protected under Schedule 5 of the Wildlife and Countryside Act 1981 in England and Wales. It is possible that populations of this rare beetle could decline further due to the presence of artificial light and polarised light pollution near ditches and ponds where they are found.


Large areas of plastic sheeting on arable fields are of particular concern as they have the potential to radiate large amounts of polarised light and thereby divert a large proportion of flying aquatic insects from water bodies; this has not been adequately researched.

### 5.1.3 Attraction to reflected light

In addition to attraction to artificial and polarised light, light reflected off coloured artificial surfaces has the potential to impact on invertebrate populations. Some colours are very attractive to pollinating insects as they are strongly associated with flower colours. Yellow objects are attractive to diurnal pollinators while white or pale grey objects attract more insects at dusk.\(^{35}\) Most attraction, for instance pollen beetles attracted to a yellow T-shirt, is likely to be very localised and, while the affected animals may waste some energy in futile activity, there is unlikely to be any significant ecological impact. However, there may be exceptions to this, large objects may attract many insects from a considerable distance; if combined with an increased risk of fatality then there could be significant ecological impacts. In particular a recent study has strongly suggested that pale grey wind turbines have the potential to attract insects at dusk and the suggestion is that this could in turn attract increased numbers of their predators, resulting in increased fatality of bats and possibly birds as well.\(^{36,37}\)

### 5.2 Repulsion from light

Many invertebrates are known to be repelled by light; examples are some species of earwigs, cockroaches, woodlice, earthworms and scorpions\(^{38,39}\). Investigating repulsion to light is more difficult than studying attraction to light; there is less available information and it is often hard to draw sound conclusions. As artificial lighting increases in both distribution and intensity there are fewer suitable places for these sensitive invertebrates to survive and reproduce. It is highly probable that increased light levels will damage the survival prospects of invertebrates that inhabit dark areas.\(^{37}\)

Zooplankton are a diverse group of small organisms that live in seas, oceans and fresh water bodies. They migrate from the depths of the water to the surface to feed under cover of darkness which helps them avoid predation from animals such as fish. However, light pollution prevents small zooplankton invertebrates such as *Daphnia* (also known as water fleas) in fresh water lakes from migrating upwards at night. As a result night-time activity near the surface


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is reduced and the Daphnia do not graze on the algae in the upper part of the water column. This could lead to an algal bloom in freshwater sources near urban areas which would considerably lower water quality²⁹.

Macro-invertebrate species such as some aquatic midge larvae and shrimps exhibit pronounced avoidance of even dim light. This behaviour is possibly a way in which they protect themselves from predation by fish which select for larger prey as light levels decrease. Artificial light can confine these species to cold, deep waters where food is less abundant and where their growth is slow, which could reduce their populations³⁰.

It is possible that invertebrates that are repelled by light will not use large areas that are illuminated by artificial lighting. The proliferation of such ‘no-go’ areas through an increase in outdoor lighting could lead to the fragmentation of habitats, and isolation of populations. Small isolated populations might not be viable in the long term, which could ultimately lead to local extinctions and reduce gene flow between populations.

Light which has short wavelengths and high frequencies such as UV, blue and green light is best discriminated by invertebrates and hence the most attractive. While high and low pressure sodium lamps are less attractive to invertebrates than some other lamp types because they emit little or no UV light, some observations suggest that normal flight behaviour of insects is completely inhibited in the general area of sodium lamps. So, although sodium lamps are less attractive to some invertebrates, sodium lamps can still affect the behaviour of others, particularly those that are repelled or inhibited by their light³¹.

5.3 Other negative impacts of artificial lighting

5.3.1 Dormancy

Invertebrate development from egg to adult is often interrupted by a period of dormancy when conditions become unsuitable, such as in very high or low temperatures or during drought. Dormancy can occur in summer (aestivation) or in winter (hibernation), and may involve quiescence or diapause. Quiescence is when development is halted or slowed as a direct response to unfavourable conditions and development immediately continues when conditions become more favourable. Diapause, in contrast, involves arrested development combined with adaptive physiological changes and development does not necessarily continue when conditions become more favourable but will only continue when particular physiological stimuli are triggered³².

Many invertebrates in temperate climates such as insects, spiders, millipedes and woodlice undergo a period of diapause which enables them to survive when

³² Antenna, 18, 80–81.
Environmental conditions become unsuitable. Day length (photoperiod) is the primary environmental stimulus involved in the regulation of their life cycles and it is significant in diapause because alteration in day length predicts much about the future seasonal environmental conditions. Photoperiod is a far more reliable environmental cue than temperature which can vary significantly from day to day, insects can detect changes in day and night length, often quite accurately, through brain receptors rather than using eyes. Experiments have shown that extending day length using artificial light prevents European corn borers (Ostrinia nubilalis) and Codling moth larvae (Cydia pomonella) from entering diapause. In such circumstances non-diapausing invertebrates would not survive the extreme conditions of winter. This would have a significant effect on invertebrate populations and could even cause local extinction quite quickly in an area.

5.3.2 Migration
Changing the natural day-night cycles of invertebrates can affect dispersal and migration. Disruption of the circadian clock (the 24-hour rhythm) of Monarch butterflies (Danaus plexippus) using artificial light has been shown to interfere with their orientation direction during migration.

It is also likely that artificial lighting could affect invertebrate migration and movement on a more local scale too, interfering with local dispersal and metapopulation connections.

Some flying insects are attracted to the lights around sea and air ports. These insects may rest on planes or boats and be transported to other regions and countries where they can become pests. This form of artificial migration is important both in economic and environmental terms.

5.3.3 Changes in activity levels
Artificial light at night has the potential to confuse invertebrates and change their natural levels of activity at night. Artificial light could also change the speed of development in invertebrates.

A high general level of illumination at night caused by artificial lighting can cause night flying insects to cease flying and settle as if it were sunrise. This prevents insects from performing normal nightly activities such as feeding and breeding.

It has been found that corn earworm moth (Helicoverpa zea) activity in a bioclimatic chamber was suppressed by light intensities as low as 0.1 lux (less than a fifth of full

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moonlight) and that field oviposition rates were significantly reduced at times of full moon. A study looking at Speckled wood butterfly larvae (Pararge aegeria) showed that a higher growth rate associated with a longer photoperiod (as would be caused by artificial light) resulted in significantly higher predation on the butterfly larvae from the primary parasitoid species. It appears that artificial light can affect growth rate and can also affect the natural predator-prey balance, which could benefit a few species while possibly negatively impacting many more.

Many diurnal (day active) invertebrates such as butterflies have larvae that feed at night, a behaviour which helps them avoid predation. British butterfly caterpillars that feed at night include Wall brown (Lesionmata megera) and Grayling (Hipparchia semele) which are listed as priority species in the UK Biodiversity Action Plan (UKBAP). Other night feeding species include Scotch argus (Erebia aethiops), Meadow brown (Maniola jurtina), Marbled white (Melanargia galathea) and Ringlet (Aphantopus hyperantus). It is likely that artificial lighting will impact on the behaviour of night feeding larvae and will either make them much more susceptible to predation or inhibit their feeding.

The larvae of riverflies and some other freshwater species exhibit a nocturnal pattern of movement called stream drift. Stream insects and crustaceans hide amongst substrate during the day, but at night they will detach themselves and drift downstream eventually reattaching themselves to the substrate. This allows movement to areas with less competition or better foraging. By moving only at night they avoid predation from fish. Stream drift is cue by low light intensity; higher light levels, such as during a full moon (0.5-1 lux in clear conditions), can suppress stream drift. Artificial light spill can produce light levels far higher than the light level recorded under full moon, so it is likely that artificial light cast onto streams will prevent a significant amount of invertebrate stream drift. A reduction in stream drift could reduce species populations, inhibit dispersal to new areas and have other wider implications for stream ecosystems.

In cave systems beyond the entrance zone there is no natural light; specialised species live in these permanently dark zones. In the UK there are several species of springtail, crustaceans and spiders that only occur in dark caves. The introduction of artificial lighting into these areas, as is often associated with public access, dramatically changes cave ecology, enabling generalist species to invade the cave and out-compete the specialist species.

On the other hand, light pollution can result in diurnally active species becoming more active at night. Necrophilous flies do not normally lay eggs at night, but will do so if an area is illuminated by artificial light and artificial nocturnal moonlight has a

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twofold influence on fruit flies: it shifts the circadian clock, and it increases nocturnal activity independently of the clock, making them become nocturnal53.

5.3.4 Disruption of bioluminescent behaviour
Beetles of the family Lampyridae, which include fireflies and glow-worms, produce light (bioluminescence) to attract mates and prey54. The Glow-worm (Lampyris noctiluca) is the commonest species of Lampyridae in Europe; this species is nocturnal and the flightless females produce a bioluminescence glow to attract flying males. There is some evidence that Glow-worms are declining in Britain and light pollution may be one of several contributory factors55.

There have been anecdotal reports that male Glow-worms are attracted to artificial lighting at night. A laboratory study showed that males respond to certain wavelengths of light. They have been found to be attracted to lights in the green to orange part of the spectrum but inhibited by blue and ultraviolet light56. Many artificial lights produce wavelengths that would be attractive to male Glow-worms. However, it is not known if artificial lighting significantly affects the breeding, mating success and population levels of Glow-worms in field conditions. The distances over which males are attracted to lights or how they judge the size of a light source is also not fully understood. It is also thought, but not yet proven, that the efficiency with which males can detect female bioluminescence is reduced when the background environment is highly illuminated by artificial lighting.

Female Glow-worms generally do not start glowing until light levels have dropped below a certain point57. Artificial light might prevent the stimulus that female Glow-worms require to initiate glowing, or it might reduce the amount of time that they would naturally glow in a night which would then decrease the chance of a successful mating. Interestingly, there have been anecdotal observations of female Glow-worms displaying under street lamps though this might simply be because females are attracted to open areas where they are more visible to males. In addition, glowing activity usually only starts above a certain ambient temperature; which happens only after warm days and before the night-time temperature drops too low.

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Artificial light has the potential to affect some of the basic functioning of Glow-worms and other Lampyridae. However, most evidence is anecdotal and more field and laboratory experiments are required to determine Glow-worm population trends and determine any negative effects that artificial lighting might have on them.

5.3.5 Nectaring and pollination

Many flowers are pollinated at night, mostly by moths. Moths require both visual and olfactory floral stimuli in order to locate and feed on flowers[9]. Unlike humans and bats, moths have colour vision at low light intensity. Crepuscular insects are most attracted to white flowers that have low ultraviolet reflectivity[10]. Moon and starlight are significantly long wavelength shifted and hence red flowers are bright against green leaves. Light pollution has many spectral peaks and hence will affect the apparent colour and contrast of flowers at dusk and night. There is a clear possibility for the pollination rates of flowers that are adapted to nocturnal pollination to be affected by emitted light pollution[10]. As moths may use colour to identify mates and rivals this activity may also be affected. There have been no studies published investigating the impacts of the colour of light pollution on the pollinating behaviour of insects.

6.0 Review of the use of artificial lighting

Artificial night lighting is used for a number of reasons in both rural and urban areas. Lighting is used for security, safety and amenity, and to enable nocturnal recreational or work activity. Significant sources of light pollution include sports facilities, commerce, retail, agriculture, buildings, monuments, mineral extraction, airports, sea ports, roads, streets, junctions, pedestrian paths and parking areas[11].

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As shown in Figure 7 there has been a significant increase in the general light pollution from lighting in the UK. The growth in the use of artificial light at night is expected to continue. In their 2009 report into the problem the Royal Commission on Environmental Pollution highlighted that over 2.3 million of the United Kingdom's 7.4 million road lights were scheduled to be replaced over the next couple of years. It is likely that the prevalent yellow low-pressure sodium vapour lighting will be replaced by a broader spectrum lights that enable humans to discern colours, but which are of greater concern than yellow lights in terms of risk to invertebrate populations and wildlife.

6.1 Units of measurement
The lux is the derived SI unit of illuminance and luminous emittance. It is the unit used by nearly all lighting designers, lighting engineers, and environmental regulators to measure light. However, this measurement places emphasis on the wavelengths most visible to the human eye and largely ignores wavelengths which are outside human vision but which are visible to other species. High pressure sodium lights, for instance, will attract moths because they emit UV wavelengths, while low pressure sodium lights of the same intensity, but which don't produce UV light, are far less likely to attract moths.

6.2 Types of lamps
There are a wide range of different lamps available which perform differently and can therefore be used for a variety of applications.

There are two main types of electric lamp: lamps that emit light by heating a tungsten filament until it glows (incandescent lamps) and lamps that work through an electric gas discharge (fluorescent lamps as well as those described as low and high pressure discharge lamps). However, incandescent lamps are less commonly used for outdoor lighting and the most inefficient varieties are in the process of being
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phased out in the EU\textsuperscript{62}. Sodium vapour lamps are most commonly used for street lighting in the UK, but there are several other varieties of lamps that are also used for night lighting.

Low pressure sodium vapour lamps, also known as sodium oxide lamps (SOX), emit light at one wavelength in the yellow part of the spectrum in which humans are particularly sensitive. They produce an orange glow which appears bright to humans but has a low overall brightness. These lamps emit no UV light and so they attract, and probably repel, the fewest number of invertebrates when compared to other types of electric light source. In addition, they are also one of the most energy-efficient of all commercial sources and they interfere less with astronomical observations than other types of lighting. However, they have several disadvantages. They produce monochromatic light, so they are usually unsuitable if human colour vision is required. High colour rendering can be important in residential and shopping areas but is less likely to be important in industrial areas. At higher wattage the lamps are too large to install in many fixtures, for example a 135-W lamp is 77 cm long and a 150-W lamp is 112 cm long. Their large size makes it difficult to focus the light from these lamps and they contribute to unattractive orange skyglow and can produce a general higher level of illumination. However, if reflective full cut-off shielding is fitted to SOX lamps then light spillage can be greatly reduced\textsuperscript{18}.

High pressure sodium vapour lamps (SON) emit a moderate band of long wavelengths including a small UV component; this makes them more attractive, and probably more repellant, to invertebrates than SOX lighting. They appear pale pinkish-yellow to humans and are popular as street lighting because they produce reasonably good colour light. They generally have a longer lifespan than SOX lamps, are medium-sized and are moderately energy-efficient\textsuperscript{18}. High pressure sodium lamps are much more compact than low pressure sodium lamps. Their smaller size makes it easier to control the direction of light by using a reflector which improves overall efficiency and reduces light spill\textsuperscript{63}. They are commonly used for road lighting, for floodlighting and industrial interior lighting\textsuperscript{64}. SON lamps have been slowly replacing SOX lamps in recent years because they produce colour light which is more acceptable to people while still being highly efficient.

'White' SON lamps are a variation of the high pressure sodium vapour lamps. They have a higher pressure than the typical SON lamp and closely resemble the colour of an incandescent light making them popular in cafes and restaurants. However, they have a larger UV component, have a shorter life and are less energy-efficient than the typical SON lamps\textsuperscript{65}.

Mercury vapour lamps emit light quite evenly over a broad spectrum, including a larger component of UV light to which insects are particularly sensitive. Some invertebrates can be attracted to mercury lamps in large numbers\textsuperscript{66}. Mercury vapour lamps are very energy-inefficient. They were used for illuminating road signs and industrial lighting but they are becoming rarer in the UK; they are not used in new
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developments and are due to be phased out for street, office and industry uses in the EU by 2015\(^{65}\).

Metal halide lamps are compact and powerful and can produce a clean white light that shows good colour rendition. They are also energy-efficient and have a long lifespan. Metal halide lamps are frequently used in commercial interiors, industry and floodlighting. They emit much less UV light than mercury vapour lamps but produce more than high pressure sodium lamps and they are still attractive to invertebrates\(^{66}\).

Light-emitting diode (LED) lamps are a relatively new technology and have only recently been considered for commercial outdoor lighting. They are extremely diverse; they are compact, long-lived and very efficient, produce a narrow beam and provide instant light\(^{67}\). LED wavelength, and therefore their colour, can vary from the near-infrared, through visible to near-ultraviolet light. White LED lamps have a broad spectrum of light. Their wavelength peaks at 450 nm and they therefore emit much more blue light than high-pressure sodium lamps. Red, yellow and amber LED lamps each have a specific, narrower spectrum and have peak wavelengths between 690 and 690 nm, which is less attractive to invertebrates\(^{67}\).

Compact fluorescent lamps are also known as energy-saving lights. Many have been designed to replace incandescent light as compact fluorescent lamps are more energy-efficient. Most compact fluorescent lamps produce a white light with good colour rendition and they emit some UV light as well\(^{65}\).

Tungsten halogen is a form of incandescent lamp. They have a variety of uses including for entertainment lighting, in medical technology, for airfield lighting and in many other industrial applications. Tungsten halogen lamps are not used for new street-lighting schemes but they are commonly used for domestic security lighting\(^{67}\). They produce a bright white light with excellent colour rendition with a UV component. Incandescent lamps attract fewer insects than mercury vapour lamps but they still attract more than low pressure sodium lamps\(^{68}\).


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![Figure 8: Spectral power distributions of various light sources]

8.3 Luminaires

The unit into which the lamp is fitted is called a luminaire and all luminaires in the UK must conform to set European standards. A great variety of outdoor lighting luminaires are available with different optical systems and light distribution characteristics. The range of luminaires exists because the function of different lights varies widely. For example, street lights can vary from lighting small single carriageway roads that are only 8 m wide, to much larger four-lane motorways that can be more than 20 m across. The luminaires are designed to emit as much light as possible where it is required. However, as diverse outdoor areas have different lighting requirements, the amount of light spill from luminaires varies.

A reduction of light spill from luminaires in street lighting can be achieved by cutting out the light emitted from the luminaires at angles greater than 70° from the vertical plane. Light emitted at angles greater than 70° will be wasted and spill out to surrounding areas that don’t need illuminating. Using a flat glass protector rather than a curved glass protector can prevent light from being dispersed upwards and sideways. Accessories in the structure of the luminaire such as shields, hoods and louvres can also be used to reduce light spill.38

7.0 Recommendations and considerations to avoid, minimise, or mitigate the impacts of light pollution on wildlife

The application of the precautionary principle, as set out in the EU Communication from the Commission on the Precautionary Principle (2000), is relevant to artificial

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light. There are reasonable grounds for concern that the effects of artificial light on
the environment may be damaging and hence there is a need to minimise the risk of
environmental damage.

All public bodies must consider the impact artificial light will have on biodiversity in
the area. In England and Wales the Natural Environment and Rural Communities
(NERC) Act 2006 came into force on 1 October 2006. Section 40 of the Act requires
all public bodies to have regard to biodiversity conservation when carrying out their
functions. The Nature Conservation (Scotland) Act 2004 came into force on 29
November 2004 and places a duty on every public body to further the conservation of
biodiversity in Scotland. These duties are commonly referred to as the ‘biodiversity
duties’. Many invertebrates are listed as national priority species for conservation
under the UK Biodiversity Action Plan (UKBAP) and are hence protected by the
NERC Act.

7.1 Light and Environmental Impact Assessments
The potential for light pollution from a development (emitted and polarised
particularly, but in the case of large structures reflected as well) should be considered
at the scoping stage of the Environmental Impact Assessment process. Light spill
onto wildlife habitats should be avoided altogether where possible, but when not
possible the impact should be considered as being likely to be significant and should
be fully assessed in the Environmental Statement.

The Environmental Statement should include a survey of species of conservation
significance (e.g. Red Data Book listed species and UK Biodiversity Action Plan
listed species) that may be sensitive to light. The scope of the survey will vary
depending on location and habitats likely to be affected, but may include moths,
Glow-worms, other beetles and aquatic invertebrates. An experienced entomological
consultant would be able to provide advice on the scope of the surveys. In addition
the Environmental Statement should include a visible light spill map that is clear and
easy to interpret (i.e. shaded lux isolines (isophotes) that go at least as low as 0.5
lux), a comparable UV light spill map and, where relevant, a similar map of polarised
light effects. A lighting plan should be provided that details the location, type,
wavelength emittance and shielding of lights. The text of the Environmental
Statement should detail areas of possible light pollution impact on invertebrates and
explain how these impacts will be avoided, minimised and/or mitigated or
compensated for. The aim should be for at least no net increase in light pollution on
wildlife habitats.

When assessing the likely significance of impacts planners should bear in mind that
light levels as low as 0.1 lux have been shown to affect invertebrate activity; that
constant light pollution at or above the equivalent of full moon light (0.5-1 lux) can be
expected to have a profound effect on many invertebrates; that insects can be
attracted to an unshielded light source from a distance of at least 500 m; and that UV
light pollution will have an even bigger impact that visible light. The impacts of
polarised light have not yet been adequately gauged in terms of intensities and
distances, but polarised light sources within 500 m of water bodies, or that reflect
light into that vicinity are of the greatest concern. Exposed surfaces that are white,
pale grey or yellow are most likely to attract pollinating insects.

In England the ‘Planning Policy Statement 23: Planning and Pollution Control’ states
the need to limit and, where possible, reduce the adverse impact of light pollution
during the planning process.
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7.2 Assess the need for lighting
Artificial lighting has many benefits for people but it can also adversely affect humans and other organisms. Better designed lighting, in the right places and at the right times, is needed, rather than just increasing the amount and brightness of artificial light at night. Lighting is perceived as good for reducing crime and accidents but this is not always the case. Studies suggest that lighting can reduce road accidents at junctions where pedestrians and traffic meet, but it does not necessarily reduce accident levels on motorways when compared to daylight conditions. Badly designed lighting can produce glare - the excessive contrast between bright and dark areas in the field of view - which can aid rather than reduce criminal activity[^9].

When planning a new development (which may or may not require an Environmental Impact Assessment) or re-evaluating an old lighting scheme the first thing that should be considered is whether lighting is really necessary. Instead of assuming that light is automatically necessary, promoters of lighting schemes should consider if:

- the development could function without artificial night lighting;
- the benefits of lighting outweigh any negative effects of lighting in a world that is required to use less energy, and is faced with rising energy costs, the cost/benefit of lighting is becoming a serious issue;
- there are alternatives to lighting; better security methods such as strong fencing can be more effective than lighting, for example.

If it is determined that lighting is necessary for a development, then several aspects of the lighting scheme must be considered to reduce the impact on invertebrates and the environment. The location and design of a lighting scheme are of particular importance.

7.3 Minimise the impacts of lighting
Lighting schemes should be developed after careful site appraisal, including where required, environmental impact assessments. Developments must comply with Health and Safety regulations but, where possible, this should not be to the detriment of wildlife. Minimising the impact of lighting is important in all locations – in cities, villages and rural areas. Installing the right kind of lamp and luminaire in the right location is very important in minimising the impact of lighting. Some of the most important habitats for invertebrates and wildlife are in or close to cities (such as brownfield sites along the Thames Estuary) so lighting must be considered in urban areas.

In addition light pollution can also be created outside the planning system, including by the activities and behaviour of individuals. Measures as simple as closing curtains and turning off lights in unoccupied rooms will reduce light pollution. The following points are key to reducing the impact of emitted light pollution.

- The brightness/wattage of the lamp. A lower brightness/wattage should reduce the impact lighting has on invertebrates in areas close to the light source. For example, high power (300/500-W) lamps are not necessary for domestic security lighting and will produce too much glare, reducing security.

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A lower power 150-W lamp should be adequate. Street and road lamps can also be fitted with dimmer switches so that their brightness is reduced when fewer pedestrians and vehicles are active. Motion detectors can be used to turn lights off completely when there is no human activity nearby; this system works particularly effectively with LED lighting as this can provide instant light as required.

- The number of lights used. Minimising the number of lights on a development will lower the overall levels of light pollution and reduce the impact that lighting will have on wildlife. An area should not be over-illuminated, it is best to only use as many lights as necessary.

- The wavelengths the lamp produces. The majority of insects and other invertebrates are most visually sensitive to the short wavelength end of the light spectrum. Therefore lamps with longer wavelengths are likely to have less effect on them (i.e. red, yellow and orange light). Lights that emit a broad spectrum of light with a high UV component should be avoided. If lighting is necessary, then low pressure sodium lamps or narrow spectrum LED lights that incorporate full cut-off shielding are preferable. This is because they produce light at one wavelength, usually in the yellow part of the spectrum in which humans are particularly sensitive, but emit no UV light. Ultraviolet-absorbing filters or glass can also be used on lamps that emit UV light. Full cut-off shielding must also be used as this directs light and prevents light spillage. Mercury vapour is most likely to have the greatest impact on invertebrates and should be avoided. Metal halide and tungsten halogen lamps can also have a negative impact on invertebrates and they too should be avoided where possible.

- Colour rendition. Connected to the issue of wavelength is the consideration of having lights that produce good colour rendition. If colour rendition is not required low pressure sodium lamps with full cut-off shielding, which produce an orange monochromatic light, should be used. However, if colour rendition is required high pressure sodium lamps with shielding should be used as they emit less UV light than many other types of lamps. There is also the potential for the development of new lamps that would have minimal impact on invertebrates but still provide good colour. A lamp that provides optimal illumination and colour rendition for human vision while having minimal impact on invertebrates and other wildlife is needed. Specially designed lamps for coastal areas where marine turtles nest have been developed and such technology could be applied to invertebrates and other light sensitive wildlife.

- The direction in which light shines. Most lights should be pointed towards the ground to illuminate the way for pedestrians and vehicles and away from natural habitats such as hedgerows, trees, water bodies and grassland. Light that spills sideways and upwards is unnecessary and will attract flying invertebrates from a greater distance. Globe luminaires and other luminaires that emit light at angles greater than 70° should not be used. Shielding can be fixed to new and existing lights to prevent light spillage. Barriers can be placed around lamps to prevent them from spilling light into surrounding areas (e.g. man-made barriers or tree planting). The height the lamp is mounted is also important for directing light. A higher mounting height has the advantage that it allows light to be directed downwards. On the other hand a shorter mounting height means a less powerful lamp can be used to illuminate an area. The emission of light from skylights should also be considered; in
factories, warehouses, offices and new-build houses, such windows should be equipped with blinds or shields; where possible these should close automatically at night.

- The period of lighting. The timing when lights are switched on and off should be carefully considered. Many lights could be switched off between midnight and 6 a.m. when few people are active. In particular all decorative and advertising lighting should be switched off during these times. Security lighting should have motion-sensor switches to keep lighting off when it is not required. They should be kept on the minimum time-setting and sensors which can be tripped by road and footway users or large animals should be avoided.

- Sensitive locations. Is the lighting in or near an area of conservation value, such as Special Areas of Conservation (SAC), Sites of Special Scientific Interest (SSSI), National Parks and Areas of Outstanding Natural Beauty, or areas where rare and specially protected invertebrates are found? Avoid lighting in these areas. Aquatic invertebrates, such as rivulets in streams and rivers, and marine invertebrates living close to the sea shore and marinas, are particularly sensitive to light pollution. Lighting adjacent to waterbodies should be absolutely minimised and any lighting that is needed should be carefully shielded to prevent it from shining directly on the water surface.

- Responsible moth trapping. Moth traps should not be routinely run in one location on consecutive nights, except where required for the scientific monitoring of populations. Moth trapping in the close vicinity of the breeding locations of rare species that occur at low density should only be carried out on a small proportion of the nights in the relevant flight period. Released moths should be given the highest possible chance of survival; preferably by being kept in cool shady conditions and then released at dusk, or otherwise released in long grass or other cover and not on lawns or other exposed surfaces, thus minimising bird predation. Collecting limited number of specimens contributes to scientific understanding of ecosystem health and dynamics but should comply with the ‘Code of Conduct for Collecting Insects and other Invertebrates’\(^\text{70}\).

- Electrocuting or stunning insect traps. These should not be placed in rural locations, such as stables, and left running at night in an unenclosed space. Large electrocuting traps placed outdoors are very likely to damage populations of invertebrates and should only be installed as a last resort to prevent a serious public health risk.

7.4 Minimise polarised light pollution

Sources of polarised light pollution should be identified and diminished, and further research into the issue should be undertaken. The use of agricultural sheeting and large areas of solar paneling in sensitive areas, particularly near water-bodies, should be limited, or sources of polarized light should be broken up by adding non-polarizing patterns, areas or grids that block horizontal light. This approach, specifically using white borders and white grates has been shown to prevent insects

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being attracted to solar panels\textsuperscript{31}. Car parks should be located far enough away from rivers and other waterbodies so that aquatic insects are not attracted to the cars for egg-laying. Asphalt road surfaces near waterbodies should not be smooth and dark. Asphalt can be made non-polarising by incorporating a rough top layer or white granules that scatter light\textsuperscript{32}. New buildings should not include glass that produces horizontally polarised light.

7.5 Don't paint large structures with colours that attract pollinators
As a precaution large structures in the countryside, particularly in perilous situations such as wind farms, should not be painted with colours that attract insects. It is well known that many pollinating insects are attracted to surfaces of a particular colour. In particular, day flying insects are most attracted to yellow surfaces, and white or pale grey surfaces attract evening and nocturnal insects. Structures painted with these colours are likely to divert pollinators away from flowers and also attract their predators. In the case of wind turbines this is likely to result in an increased mortality of insects, birds and bats. More research is required to determine the likely magnitude of the effect and if high UV reflectivity can reduce attractiveness.

7.6 Conserve and create areas with natural light regimes
At present our understanding of the extent to which artificial lighting has an effect on invertebrates and the wider environment is poor. Some invertebrates, such as those with superposition eyes (e.g. hawkmoths) are sensitive to even very low light levels. While reducing artificial light and changing lamp types if often beneficial; it is recommended that places with natural or near-natural light regimes should be conserved and created. Galloway Forest Park in southern Scotland became Europe’s first official Dark Sky Preserve with the International Dark-Sky Association in 2000. It is increasingly important that there is more official protection of areas with natural light regimes. Where possible additional Dark Sky Preserve areas should be identified to complement the Galloway Forest Park Dark Sky Preserve. In these areas existing light pollution should be reduced and strict limits and constraints placed on any new lighting.

Artificial lighting should not be installed in natural cave systems. In existing show caves every effort must be made to minimise the amount of time that lighting is on and lamps with a narrow light range between yellow and red should always be used in all areas where colour perception is not necessary.

Lighting necessity should be considered and it kept to a functional minimum in all areas. However, certain locations are likely to be particularly sensitive and artificial lighting in these areas should be carefully planned, reduced or, ideally, totally removed to avoid negatively affecting invertebrates and the environment.

- Conserve existing areas with natural light regimes and aim to further reduce artificial light levels from the surrounding locations. These areas should be designated as Dark Sky Preserves.


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- Create new areas with natural light regimes. Avoid lighting and reduce/eliminate general light levels in and near areas of known conservation value. This would include areas where Red Data Book listed and UK Biodiversity Action Plan (UKBAP) species with localised distributions are found, Special Areas of Conservation (SAC), Sites of Special Scientific Interest (SSSI), National Parks and Areas of Outstanding Natural Beauty. Areas that are of conservation value and are home to rare invertebrates and other wildlife include urban settings as well as suburban and rural habitats. Steps should be actively taken to reduce light levels in these areas with the aim that these locations could eventually be designated as Dark Sky Preserves.

7.7 Raise public awareness

The general public should be made more aware of the issues of artificial light pollution and the environment. The public can then understand and support positive changes made by public bodies to lighting schemes, and light polarisation or reflection effects.

Raising awareness will also help reduce light pollution from private residences. Most artificial light produced in Britain comes from industry and housing developments and from road and street lighting. Local authorities and the planning system have a major part to play in reducing the environmental impact of artificial light, but members of the public also should be aware of the issue. Domestic lighting is mostly outside of planning control, but too can cause problems to the environment. Most domestic security lighting is purchased by members of the public who are not fully aware of the environmental impacts of lighting. Information on lighting types, installation and maintenance should be given before purchase to reduce the impact of these domestic lights. Retailers selling domestic security lighting should be properly trained and informed on the issues. Similarly there is currently low awareness of the negative impacts of solar panel associated light polarisation on aquatic life and the readily implementable solutions to this threat.

8.0 Further research requirements

This report has highlighted what is known about the biological impacts of artificial light on invertebrates. However, we still know very little about the effects artificial light has on invertebrates, particularly at population and ecosystem level. Indeed in the 2006 paper 'The identification of 100 ecological questions of high policy relevance in the UK' one of the questions prioritised was "What are the effects of light pollution from built development and road lights on wildlife behaviour, mortality and demography?". There has been little progress in answering this question since 2006. The 2009 Royal Commission on Environmental Pollution report on 'Artificial Light in the Environment' recommends 'that the Natural Environment Research Council, with input from other agencies, leads a pilot programme of directed research to explore the impacts of artificial light on populations and ecosystems, and to clarify...'

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the effects of both existing and proposed lighting technologies on biological systems*. It appears that this programme has not been implemented and indeed that NERC has not funded any research into light pollution in the last decade. Research on the issue should be implemented to develop our understanding and enable the minimisation and mitigation of negative effects of artificial light on invertebrate populations.

The following research priorities have been identified:

- Information on invertebrate sensitivity to light of different wavelengths is still limited and patchy. What level of illumination produced by artificial light causes no ecological impacts to invertebrates? Further fundamental research on the light sensitivity of a wide range of invertebrate taxa is required.

- Is artificial light to blame, or partly to blame, for the long-term declines in moths, butterflies and other invertebrates in the UK? If so, what are the mechanisms and how can they be ameliorated?

- What are the impacts of light pollution on Glow-worm populations?

- What are the impacts of light pollution on populations of light-averse invertebrates?

- Do artificial sources of polarised light cause population level effects on flying aquatic invertebrates?

- Does artificial light affect the ability of moths to detect flowers and reduce the pollination rates and population levels of moth pollinated plants?

- To what extent do artificial light sources act as barriers to the movement of invertebrates through the countryside and urban areas?

- Over what distances do artificial light sources affect the behaviour of moths and other night-flying insects?

- Can wind turbines be painted in colours that reduce their attractiveness to invertebrates, impacts on invertebrate populations, and thereby fatalities of their predators (bats and birds)? In particular the effect of high UV reflective pale paints should be investigated.

9.0 Conclusion

Invertebrates make up the majority of biodiversity and they are vital to ecosystems. Artificial light in the wrong place at the wrong time adversely affects the life cycles and survival invertebrates. This could have knock on effects at a population level, contributing to declines and extinctions of species.

Artificial light has the potential to significantly disrupt ecosystems and it has long been of concern to conservationists. It is widely observed that some invertebrates, such as moths, are attracted to artificial lights at night. Artificial lighting can significantly disrupt the natural light/dark patterns. Many invertebrates depend on the natural rhythms of day-night and seasonal and lunar changes to light levels. As a result artificial lighting has several negative impacts on a wide range of invertebrates,
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including disrupting their feeding, breeding and movement, which may reduce and fragment populations. In addition the polarisation of light by shiny surfaces is a significant problem as it attracts aquatic insects, particularly egg laying females away from water and reflected light has the potential to attract pollinators and impact on their populations, predators and pollination rates.

Because invertebrates are so fundamentally important to healthy ecosystems and because declines and threats mean that many species are already listed as national priority species for conservation under the UK Biodiversity Action Plan (UKBAP), it is imperative that avoidable threats to their well being are avoided.

Action to reduce artificial light impacts is necessary and justified now. Although further research is required to fully understand the impacts of artificial light on invertebrates and the environment as a whole, the precautionary principle applies and enough is known to take action now. This report makes several recommendations that would reduce and mitigate the negative effects that artificial light has on invertebrates.

Local authorities and Government departments must take a lead on reducing the impact of artificial light. The environmental impact of light for new developments must be more prevalent in the planning process and more routinely part of the Environmental Impact Assessment process. Public bodies have a 'biodiversity duty' under the NERC Act 2008 and Nature Conservation (Scotland) Act 2004 and must consider the impact that lighting, polarisation and reflection will have on biodiversity.

Light pollution levels should be generally reduced everywhere. However, it is particularly important that areas that currently have low lighting levels and areas that are important for wildlife should be identified and progress to become Dark Sky Preserves.

Established lighting schemes should also be reconsidered to reduce their impact on the environment. In addition, the issue of artificial light and its environmental impacts on invertebrates and other wildlife should be given a greater public profile.

10.0 Acknowledgements

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11.0 Appendices

11.1 Further reading


11.2 Legal protection of invertebrates

Wildlife and Countryside Act 1981

Many of Britain's wild plants and animals are legally protected. The main law dealing with this is the Wildlife and Countryside Act, which was passed in 1981. This act was amended by the Countryside and Rights of Way Act 2000, which covers England and Wales but not Scotland. Wild birds and certain other wild animals (including some invertebrates) are legally protected. A schedule (Schedule 5) in the Wildlife and Countryside Act lists the animals other than birds that qualify for protection.
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In Northern Ireland the Wildlife and Countryside Act is transposed by the Wildlife (Northern Ireland) Order 1985. With regard to the protection of species, this is very similar to the Wildlife and Countryside Act.

Habitat Protection
Most threatened animals cannot be properly protected without conservation of their habitats. There are legal provisions for the protection and management of areas where threatened species occur.

- Sites of Special Scientific Interest (SSSIs), National Nature Reserves and Marine Nature Reserves are selected and protected under British law because they are examples of important habitats and often contain rare invertebrates.

- Special Areas of Conservation (SACs) are chosen under the Habitats Directive for other animals and plants requiring habitat protection in Europe as a whole. Among these species are the Stag beetle (*Lucanus cervus*) and White-clawed crayfish (*Austropotamobius pallipes)*.

- Other areas in the UK are designated under the Ramsar Convention, a worldwide agreement on the conservation of wetlands.

Habitat Action Plans have been drawn up for priority habitats under the UK Biodiversity Action Plan.

International statutes
The UK is bound by international legislation on species protection. The 1992 Habitats Directive covers all the countries of the European Union. Under these Directives, strict protection (very similar to provisions under the Wildlife and Countryside Act) is required for a large number of plant and animal species. For another group of animals and plants listed in the Habitats Directive, conservation measures are required if killing or taking from the wild poses a threat to these species.

The UK has signed up to other international agreements on wildlife protection

- The Bern Convention covers the states in the Council of Europe. It gives protection to threatened plants, animals and habitats and regulates the exploitation of certain species.

- CITES (the Convention on International Trade in Endangered Species of Wild Fauna and Flora) regulates international trade in threatened animals and plants.

- The United Nations Convention on Biological Diversity, which was drawn up at the Earth Summit in Rio de Janeiro in 1992, requires this country to take action to conserve its threatened species and habitats. As a result, the UK Biodiversity Action Plan has been drawn up and this includes practical measures for the conservation of many of Britain’s rare and declining species.

‘Biodiversity duty’
In England and Wales the Natural Environment and Rural Communities (NERC) Act 2006 came into force on 1 October 2006. Section 40 of the Act requires all public
Letter 8 Continued

bodies to have regard to biodiversity conservation when carrying out their functions. The Nature Conservation (Scotland) Act 2004 came into force on 29 November 2004 and places a duty on every public body to further the conservation of biodiversity in Scotland. These duties are commonly referred to as the ‘biodiversity duties’. Many invertebrates are listed as national priority species for conservation under the UK Biodiversity Action Plan (UKBAP) and are hence protected by the NERC Act.

Invertebrates make up the majority of living species in Britain and globally, therefore invertebrates are hugely important for biodiversity. Artificial lighting could be a factor in invertebrate population declines so artificial lighting might be reducing biodiversity in general. Public bodies must consider artificial lighting in relation to their ‘biodiversity duty’.
The effects of coloured light on nature

C.J.M. Musters, D.J. Snelder & P. Vos

CML report 182
Department of Conservation Biology
Letter 8 Continued
The effects of coloured light on nature
A literature study of the effects of part of the spectrum of artificial light on species and communities

C.J.M. Musters, D.J. Snelder & P. Vos

February 2009

CML report 182

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Letter 8 Continued

Abstract

Present regulations to minimize the impact of light pollution focus on intensity of artificial light only. However, modern light equipments allow for the manipulation of other light characteristics as well, such as the spectral properties and polarization of the emitted light. It might be possible to design lamps and lamp armatures in such a way that, within a certain setting, the emitted light has the sufficient quality to support human activities, but has at the same time no or minimal effects on biological processes of the organisms or communities nearby. This paper tries to assess the availability of knowledge of the effect of parts of the spectrum of artificial light on species and communities needed for that design.

Because we expected literature on the effects of light on ecological processes to be rare and because effects of light on, for example, physiological processes could possibly be used to hypothesize ecological effects, it was decided to collect information on effects on physiology, behaviour, populations, and interactions between species. To establish gaps in our knowledge of the effect of parts of the spectrum on ecological processes, we made tables that summarize the knowledge per main effect. To be able to appreciate the gaps in our knowledge we developed a simple system for weighting the relative importance of the potential ecological effect per species group. Combining the gaps in our knowledge with this weighting gives an indication of the priorities for future research.

Much is still to be learned about the effects of light on nature, and we found that this is especially true for the effect of coloured light (i.e., specific wavelength). As a matter of fact, studies on the effect of coloured light on populations, species interactions, or communities are almost completely missing. However, we also found that for some species groups detailed information is available of the effect of certain wave lengths on physiology and behaviour.

This knowledge seems to give enough clues to at least postulate a spectrum that might be of relatively low disturbance for a specific species group. Lamps can be designed based on these spectra and these lamps can be tested in the field. Any field study of the effects of coloured light on survival, dispersion or competition of species or species groups would be a considerable contribution to our knowledge.
3.0 COMMENTS AND RESPONSES

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1 Introduction

1.1 Artificial outdoor light as a problem

At the global level, 19% of the earth surface experiences night sky brightness from artificial sources (Rich & Longcore 2006) and 20% of the human world population has lost the ability to see the Milky Way with the naked eye (Smith, 2009). In developed countries this percentage is much larger. In the US, for example, 60% of the people no longer can see the Milky Way (Smith, 2009). This is only one form of what is sometimes called light pollution and is generally considered as a problem for both humans (the appreciation of the landscape) and nature conservation.

Studies showing the influence of artificial light on wildlife go back to the 19th century and light pollution seems to have been a focus of research since the second half of the 20th century, illustrated by overviews like those of Bainbridge et al. (1966; 1975), De Molenaar et al. (1997) and Rich & Longcore (2006). De Molenaar et al. (1997) speak about an “overwhelming” amount of literature on the effects of light on animals. Yet, Rich & Longcore (2006) end the introduction to their overview by stating that “much more remains to be learned”. As a matter of fact, the study of the ecological effects of artificial outdoor light is a huge research field.

Ever since its origin, light has been an important environmental factor for life. In one of the earliest serious theories of the origin of life – that of Oparin and Haldane from the 1920s –, UV-light plays a key role in the building of complex organic compounds (Dawkins, 2004). Because light contains energy and because its availability, primarily as sun light, is ever changing in daily, monthly (‘moonly’), and yearly cycles, almost all organisms have evolved adaptations to light and its cycles. Therefore, light is of the same order of importance for wildlife as water or nutrients. It has a number of characteristics, like intensity, wave length and polarisation, to each of which physiological, ethological and ecological processes have been adapted differently, though not necessarily independently. Besides, light sets time: it defines days, months, and years. Light pollution can therefore be supposed to disturb many long evolved adaptations and have all kinds of effects, on all kind of organisms and all kinds of processes. No wonder that even though a large body of literature exists on effects of light on certain biological processes, our knowledge of the ecological effects of artificial outdoor light is far from complete.

Although our knowledge is incomplete, the fear that light pollution may have an important impact on nature, has led the Dutch Directorate-General for Public Works and Water Management to adopt a ‘No, unless’ policy. This says that in or near nature conservation and recreational areas, streets will not be lightened unless there are important reasons, primarily from the point of view of road safety. Other Dutch regulations include the principle of ‘As Low As Reasonably Achievable’ (Anonymous 2007). Thus, these regulations focus on intensity of artificial light only. However, modern light equipments allow for the manipulation of other light characteristics as well, such as the spectral properties and polarisation of the emitted light. It might be possible to design lamps and lamp armatures in such a way that, within a certain setting, the emitted light has the sufficient quality to support human activities, but has at the same time no or minimal effects on biological processes of the organisms or communities nearby. This paper tries to assess the availability of the


5
knowledge needed for that design.

1.2 Spectral aspects

From every introduction to biology for undergraduates it can be learned that plants have three types of chloroplast pigments, each absorbing a different part of the light spectrum for photosynthesis. The result is that plants use primarily the blue and red parts of the spectrum for photosynthesis, and not the green parts. That’s why plants are green. From the same introductions it can also be learned that the vertebrate eye has rods and cones, that cones occur in different types and that each type is sensitive to a different colour, i.e., that these cones start firing signals to the brain only when light with a certain wave length and intensity falls upon them.

These are two well known examples of the fact that biological processes may be affected by only a limited part of the spectrum of natural light. Lamps that emit other parts of the spectrum would have limited effects on the processes. Green lamps will hardly make plants to photosynthesize during the night. However, photosynthesis is not the only process within plants that is affected by light. Direction of growth and timing of the start of leaf development in spring are also known to be affected by light, for example. Are these processes also not affected by green light? And how about the bees that are needed for the pollination of the plants? Are these also not affected by green light?

It is obvious that for the design of ecological friendly lamps based on spectral properties, one needs to know the effect of different parts of the spectrum on as many relevant processes as possible. This seems a rather vast task for the lamp designer. However, one should bear in mind that the list of relevant processes might not always be very long. The disturbance of bird migration routes by lighted oil platforms is a good example of a relative simple problem solved with a change in the spectral properties of the light (Poot et al, in press).

So, in situations where artificial light is essential for human activities but at the same location high valued wildlife might be disturbed by that light, using lamps that emit a limited part of the spectrum may be a solution. Problem is, of course, that in most cases the disturbance of wildlife by artificial light is poorly known, let alone which parts of the spectrum are relevant. Therefore, in many cases one would like to follow a prudent strategy: within or close to areas with high nature value, lamps are to be used that disturb wildlife as less as possible, according to present knowledge. Do we know enough of the effects of certain parts of the spectrum on biological processes to be able to design lamps for this purpose? In order to answer this question we performed a literature study of which this paper describes the results.

1.3 Aim of this paper

The aim of this paper is to summarize existing knowledge of the parts of the spectrum of natural light that affects biological processes most, in order to be able to either make recommendations for the spectral properties of ecological friendly outdoor lamps or to design an agenda for a research program needed for the development of ecological friendly outdoor lamps.

3.0 COMMENTS AND RESPONSES

Letter 8 Continued

For outdoor lamps, we focus on lamps to be used in terrestrial environments under moderated climates. For aquatic systems this means that only relatively small fresh water bodies are to be taken into consideration.

2 Methods

2.1 Effects of spectral parts of artificial light

For the design of lamps with a nature friendly spectrum, one needs to know which parts of the spectrum have an effects on the populations of organisms and/or on communities, and which parts have no effect. The new lamps could be designed based on the idea that they should have a spectrum composed of parts that show no effect. Therefore, the information needed from literature is whether there is an effect or not of a certain part of the spectrum. The ‘direction’ of the effect is not really relevant: any effect can be regarded as a disturbance of the natural processes. For example, for this study it is irrelevant whether a bird is attracted or repulsed by red light. Attraction could result in a higher than natural chance of collision, and therefore to higher mortality rates, but repulsion could lead to lamps acting as barriers, and therefore to lower dispersion rates. Besides, what could be regarded as a positive effect for one species, i.e., an effect that enlarges the population of that species, will undoubtedly have to be regarded as a negative effect for its food source, prey or competitors, and again positive for its parasites or predators. So, because of this complexity of interpreting the meaning of the effect and because for the design of lamps it is not really necessary to know the exact meaning, we focussed our analysis of literature on assessing whether an effect was shown or not. This strongly simplified our literature analysis. Of course, once a certain lamp is tested in the field, for the interpretation of the results it becomes crucial to know the type and direction of the effects. But that asks for a different kind of literature analysis.

2.2 Scheme of analysing literature

In the end, our research question is an ecological one. However, because we expected literature on the effects of light on ecological processes to be rare and because effects of light on, for example, physiological processes could possibly be used to hypothesise ecological effects, we decided to collect information of effects on:

- Physiology
- Behaviour
- Populations
- Interactions between species.

Within these fields we identified the processes supposed to be keys to ecological functioning.

Next, for each process we tried to find out what is known of the effect of light and parts of the spectrum on:

- Plants
- Animals
  - Invertebrates
    - Insects

Letter 8 Continued

- Non-insects
  - Vertebrates
    - Fish
    - Amphibians
    - Reptiles
    - Birds
    - Mammals

The description of our results follows this scheme of analyses.

2.3 Existing reviews

As stated before, a number of reviews are available on the ecological effects of artificial light. Of these, we used De Molenaar et al. (1997), De Molenaar (2003) and Rich & Longcore (2006) as starting point of our literature search. Summarises of the findings of these authors will be incorporated in our results.

2.4 New literature

Because the availability of recent reviews, we decided to restrict our literature search to articles in ISI journals published after 2000. The formal query applied is given in box 1. This resulted in 220 publications. However, much to our surprise we found that a number of relevant articles known to us, were not included in this list. For this reason, we supplemented the list with every relevant article we came across. This resulted in our final reference list.

2.5 Gaps in knowledge

To establish gaps in our knowledge of the effect of parts of the spectrum on organisms and ecological processes, we made tables that summarize the knowledge per main effect. To be able to appreciate the gaps in our knowledge we developed a simple system for weighting the relative importance of the potential ecological effect per species group. Combining the gaps in our knowledge with this weighting gives an indication of the priorities for future research.
### Box 1: Queries used for literature search.

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<th>all databases 5 years</th>
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<td>612</td>
<td>5882</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Topic: &quot;spectral composition&quot; OR &quot;light intensity&quot; OR &quot;spectral sensitivity&quot; OR &quot;wavelength discrimination&quot; OR &quot;wavelength sensitivity&quot; OR &quot;electromagnetic spectrum&quot; AND:</td>
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<td>50</td>
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</tr>
</tbody>
</table>

Letter 8 Continued

3. Results

3.1 Physiology

Perception
Almost all organisms are known to perceive light in some way or another. However, information on the perception of light or spectral aspects of light is in itself not the goal of this study. Our aim is the disturbance of artificial light of organisms. Disturbance cannot be concluded from perception alone; it has to be demonstrated by a change in crucial physiological processes, in behaviour, in population processes or in interactions between organisms. For that reason we refrain from further discussion of perception as such.

Growth (table 1)
Light obviously affects growth of plants and other photosynthetic organisms. The use of artificial light in warehouses and laboratories proves that growth is also affected by artificial light on algae, corals and plants (Meseck et al. 2005; Sandnes et al. 2005; Demetropoulos & Langdon 2004; Ogbona et al. 2007; Holcomb & Berghage 2001; Tazawa 1999; Fukuda et al. 2002; Schlagel 2007). Plants show a two peak action spectrum of photosynthesis, with one peak in the short wave region and one in the long wave region. A low level is found in between, in the green and yellow region. Urbonaviciute et al. (2007a, b) confirm that a spectrum consisting of only two components may be enough: one in the red regions and one in the short-wave region either being cyan, blue or UV. However, they also found that adding light of the wave length in the blue-green region (505 nm) slightly improved growth and is favourable for biomass accumulation as compared to other wave lengths in the short wave length region. Under artificial light, plants seem to perform best when the red/infra-red ratio is close to the ratio of natural light (Ramalho et al. 2002). When infra-red dominates the spectrum, as in nature is the case in the shade of other plants, plants will elongate (Briggs 2006). Plants grow towards sources of light. This phototropism is known to be affected not only by infra-red light, but also by the blue parts of the spectrum (250-500 nm, with a peak around 450 nm, Briggs 2006).

Light may affect feeding efficiency and through this also indirectly growth in salmon (Taylor et al. 2006). Amphibian larvae grow fastest and larger in dark (Gutierrez et al., 1984) and poultry and steer raising show less problems under interrupted light regimes as compared to continuous lighting (Buyse et al. 1996; Kasuya et al. 2008). Growth of haddock larvae was not different under blue (470 nm) or green (530 nm) light as compared to complete darkness, although survival was significantly higher under white light (Downing 2002). Green light stimulation of chicken and turkey eggs increased productivity (Rozenboim 2003; Shafey & Al-mohsen 2002), while hens produce less eggs under infra-red light (Rozenboim et al. 1998). Meat production of poultry was highest under blue light (Marosivic et al. 1990).

So, based on experimental studies aim at productivity of plants, fish and poultry for commercial purposes, we can summaries that growth in plants and birds seems to be affected by both short wave lengths (violet, blue and green) and long wave lengths (red and infra-red), while in fish at least one study shows no effects of blue and green light.

Letter 8 Continued

Table 1

<table>
<thead>
<tr>
<th>Growth</th>
<th>UV&lt;sup&gt;1&lt;/sup&gt; &lt; 300</th>
<th>Violet 301-450</th>
<th>Blue 450-550</th>
<th>Green 550-600</th>
<th>Yellow 600-650</th>
<th>Red &gt; 650-750</th>
<th>Inter red &gt; 750</th>
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<td>x</td>
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<tr>
<td>Comils</td>
<td>+</td>
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<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Fish</td>
<td>+</td>
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<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>x</td>
</tr>
<tr>
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<td>+</td>
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<td>x</td>
<td>x</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>x</td>
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<tr>
<td>Birds</td>
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<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
</tr>
</tbody>
</table>

x: from laboratory data; X: from field data

Hormone regulation (table 2)
 Virtually every aspect of multicellular organism growth, development and behaviour is regulated by hormones, of which a number are again regulated by light. Here we only discuss those that are not related to growth (see above). For plants, we only came across literature related to growth. Artificial light might suppress the release of pheromones in insects (Shorey & Gaston 1964, 1965; Sower et al. 1970; Fatzinger 1973). Several studies have shown that changes of length of day with artificial lights disrupt hormone regulation in amphibians and mammals (Bush 1963; Biswas et al. 1978; Green et al. 1999; Green & Besharse 1996; Lee et al. 1997; d’Estrée et al. 1994; Nozake et al. 1990). This is at least partly due to the suppression of melatonin production, which takes place during the night in natural settings. Melatonin production is also suppressed by blue light in mammals (De Molenar 2003) and by UV light in birds (Zawilska et al. 2000; Lewis et al. 2007), but stress hormone production is decreased in chicks when UV light is missing in the spectrum. Fish showed an increased production of stress hormones under high intensity blue light, but not under white light or low intense blue light (Mignau et al. 2007).
3.0 COMMENTS AND RESPONSES

Letter 8 Continued

Table 2

<table>
<thead>
<tr>
<th>Hormone regulation</th>
<th>UV 380</th>
<th>Violet 389-450</th>
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<th>Green 500-550</th>
<th>Yellow 555-600</th>
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<td></td>
<td></td>
<td></td>
<td>x</td>
</tr>
<tr>
<td>Fish</td>
<td>+</td>
<td>x</td>
<td></td>
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<td></td>
<td></td>
<td></td>
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<td>Interaction with intensity</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td>x</td>
<td></td>
<td>Interaction with length of artificial lighting phase; with melatonin production</td>
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<tr>
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<td>x</td>
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<tr>
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</tr>
</tbody>
</table>

Circadian clock (table 3)
Both plants and animals show an internal, daily, i.e., circadian clock, which is not exactly 24 hours. Therefore, it must be synchronized to local time by a signal in the environment. The signal used to synchronize the internal clock is called a “Zeitgeber”. In nature, the red/infrared ratio in light seems to function as a Zeitgeber for plants (Briggs 2006). For vertebrates the primary Zeitgeber is change in quantity and spectral quality of light at dawn and dusk. The circadian rhythm can be disrupted by artificial light (Beier 2006).

Only two papers are available that describe the effect of outdoor lamps on plants during a 16 hours night (Cathey & Campbell 1975a, 1975b). They show that plant species differ widely in their sensitivity to short day extended with this type of lamp: flowering was delayed in some short-day species, promoted in some long-day species, and vegetative growth was enhanced in several species, but some species showed no measurable response. Response depended of type of lamp used.

The circadian clock is supposed to get disturbed in moths that fly close to artificial light at night (Frank 2006), but this effect may be low for low pressure sodium lamps (589 nm) (Pittendrigh & Minis 1971). The two-spotted spider mite showed resetting of the circadian clock from blue (475 nm), yellow (572 nm) and orange (612 nm) light, but not from red light (658 nm) (Suzuki 2008). Intensity needed to result in resetting increased from blue to orange.

Larvae of salamanders show diurnal patterns in vertical migration within ponds that can be affected by artificial light (Anderson & Graham 1967). In Xenopus, the circadian cycle of melatonin synthesis was suppressed by monochromatic light with wave lengths equal and lower than 533 nm (Cahill et al. 1998). Several diurnal reptile species use artificial light for expanding their activities in the night (Perry & Fisher 2006). The sensitivity to light seems to have a diurnal pattern in alligator hatchlings, but depends on temperature (Kavaliers 2008). It is well known that artificial light affects the daily singing timing in songbirds (Oaten 2002).

For mammals, many studies show that artificial light can disrupt the circadian clock.
Letter 8 Continued

(Halle & Stenseth 2000; DeCoursey 1986; Sharma et al. 1997; Kayumov et al. 2005; Downs 2003). However, the effect of the different wave lengths seems to differ between species: in Golden Hamsters melatonin production is suppressed by light with wave lengths between 300-500 nm, but not by wave lengths smaller than 290 nm or larger than 640 nm (Brinnard et al., 1994), while in laboratory rats melatonin production is suppressed by light (290 nm), red (670 nm) and yellow (570 nm), but not by blue light (450 nm) (Aral 2006). Bats showed shifts in circadian clocks after pulses of artificial light, but the effect depended on the moment the pulses were given: when given early during the rest period in their roots, blue (480 nm) and green light had a large effect (520 nm), but violet (430 nm) and yellow light (580 nm) had hardly any effect; when given late, violet (430 nm) and blue light (480 nm) had a high effect, but long wave lengths had not. When the pulses are given early, the optimum effect is reached by green light (520 nm), when given late the optimum is reached at violet light (430 nm). Yellow (580 nm) and red light (654 nm) never seem to have an effect (Joshi & ChandraShekar 1982; 1985a; 1985b). The moment the bats leave their roost may be affected by artificial light, but also depends on light intensity. In relatively low intensities, red light does not seem to affect the bats (Down 2003).

| Table 3 |
|-------------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|
| Circadian clock  | Light & colour  | x               | x               | x               | x               | x               |
| Plants            | UVA/Vis         |                 |                 |                 |                 | Interaction with type of light, Red/Infra-red ratio |
| Insects           |                 |                 |                 |                 | x               |                 |
| Spiders           |                 | x               | x               | x               | x               | No sensitivity in terms of induction of diapause |
| Amphibians        |                 | x               | x               | x               |                 |                 |
| Reptiles          |                 |                 |                 |                 | x               | x               | Interaction with temperature? |
| Birds             |                 |                 |                 |                 |                 | x               |
| Mammals           |                 | x               | x               | x               | x               | x               |
| Bats              |                 | x               | x               | x               | x               | x               | Interaction with circadian time, intensity |
| All               |                 | x               | x               | x               | x               | x               | x               |
|                    |                 | x               | x               | x               | x               | x               |

x: from laboratory data; X: from field data.

Circannual clock (table 4)
Organisms have also an endogenous rhythm with a period of about one year. The circannual clock affects annual changes in body mass, hormones, reproductive status, hibernation, and the circadian activities over the year.

Plants are known to regulate their flowering time based on the length of the photoperiod, i.e., on the length of the night. Some species need a minimal night length (short-
day plants), others a maximum night length (long-day plants), while others do not react to night length. Flowering timing can be disturbed by short flashes of red light (660 nm) during the night, but can be recovered by an infra-red flash (730 nm) after the red flash (Borthwick et al., 1952a). Also, seed germination, leaf expansion, development of photosynthetic machinery, and entry into dormancy are regulated by this red/infra-red reversible system (Borthwick et al., 1952b; Biggs 2006). Holcomb & Berghage (2001) showed that in lilies flowering was delayed and number of leaves produced increased as the photoperiod was increased, but it is unclear whether this is related to the circannual clock in the plants.

The importance of light as a circannual regulator in animals seems to relate to its crucial role in the production of melatonin and the importance of the latter in regulating the reproductive activity (Bartness & Goldman 1989).

Exposure of birds to artificial light during winter causes premature breeding conditions in the laboratory and a shift in migration timing in the field (Lofts & Morton 1968; Rees 1982). The development of gonads is induced by blue (450 nm), green (528 nm) and red light (654 nm) but depends on light intensity (Kumar & Rani 1996; Kumar et al. 2000). Remarkable is that a pair of African bat hawks had a less than 12 month year cycle in an urban area which was attributed to the year round availability of light attracted bats (Hartley & Hustler 1993). Wallabies showed no endogenous cycle with moonlight (Biebouw & Blumstein 2003).

### Table 4

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</table>

x: from laboratory data; X: from field data.

### 3.2 Behaviour

General activities (table 5)

Under general activities we have tried to capture all animal activities that cannot be regarded as behaviour due to internal clocks or navigation. It includes foraging behaviour, anti-predator behaviour, schooling behaviour and sexual behaviour.

It has been shown that moths may not mate unless light intensity is below that of a quarter moon (Agee, 1969). Moths do not show their usual anti-predator behaviour when flying around lamps (Acharya & Fenton 1999; Svenson & Rydell 1998). Lobsters did no show changes in anti-predator behaviour under red light as compared to darkness (Weiss et al. 2000).
Fish are known to change their activity under artificial light (Harden Jones 1956; Woodhead 1956; Nightingale et al. 2006), but also their foraging behaviour (Hobson 1965; Blaxter 1975; Beeler 2002; Mazur & Beauchamp 2006; Contor & Groffith 1995; Prinslow et al. 1980), schooling behaviour (Hobson 1965; Johansson et al. 2006; Woodhead 1966; Harden Jones 1956), anti-predator behaviour (Nightingale et al. 2006), and migration behaviour (Tabor et al. 2001). These effects have not only been shown in the lab, but also in the field (Johansson et al. 2006; Mazur & Beauchamp 2006; Nightingale et al. 2006; Contor & Groffith 1995; Prinslow et al. 1980; Tabor et al. 2001). In nature these effects can be observed as changes in fish behaviour following lunar cycles (Gibson 1978; Patler 1971). Reaction of fish on artificial light may depend on light intensity (Harden Jones 1956; Woodhead 1956), fish density (Johansson et al. 2006), predator density (Fraser & Metcalfe 1997) water temperature (Johansson et al. 2006), life stage (Hoar 1951; Folmar & Dickhoff 1981; Hoar 1976; McInerney 1964) and season (Fraser & Metcalfe 1997).

Surface activity of terrestrial salamanders is affected by artificial light (Adler 1969; Griffith 1985; Wise & Buchanan 2006). Toads and frogs are well known to select sources of artificial light for foraging (Baker 1990; Gein 1958; Gein & Gein 1957; Wright & Wright 1949; Henderson & Powell 2001), but it is unclear whether this behaviour is a reaction on a higher prey density, better visibility of the prey, phototaxis, or a combination of these (Frank 1988; Buchanan 2006). Mating, nesting, and territorial behaviour might be affected by light (Rand et al. 1997; Tarano 1998; Buchanan 2006; Wise & Buchanan 2006; Nunes 1988), but some species were found not to change their calling behaviour under artificial lighting (Buchanan 2006). Foraging ability was affected by artificial light (Buchanan 1993; Placyk & Graves 2001), but may depend on the presence of chemical clues (Wise & Buchanan 2006).

Foraging was not affected by UV light (Placyk & Graves 2001). Amphibians need time to adapt to changes in light, and can therefore temporarily be blinded by changes of light intensity (Buchanan 1993; Wise & Buchanan 2006).

Sea turtles avoid parts of the beach that are artificially illuminated for laying eggs (Witherington 1992; Salmon et al. 1995b; Salmon et al. 2000), but this effect is not present when the lamps used are low pressure sodium lamps (598 nm) (Witherington 1992). Foraging behaviour of reptiles may change under artificial light (Zhou et al. 1998; Clarke et al. 1996), also known from natural changes in light intensity from moon phases (Frankenberg & Werner 1979; Bouskila et al. 1992; Reichman 1998; Andreadis 1997; Clarke et al. 1996; Pacheco 1996; Bouskila 1995; Perry & Fisher 2006).

Poultry change their foraging and feather-pecking behaviour under different types of white artificial light, depending in light intensity (Boshouwer & Nicaise 1993; Kristensen et al. 2007). De Molenar et al. (2000) found that Godwits changed their breeding behaviour near road lamps.

Rodents are shown to change their activity and foraging behaviour under artificial light, both in laboratories and field settings (Vasquez 1994; Kramer & Birney 2001; Brillhart & Kaufman 1991; Clarke 1983; Falkenberg & Clarke 1998; Kotler 1984; Bird et al. 2004), although there might be difference between species (Alkon & Saltz 1988; Vasquez 1994). This is in concordance with the observation that activities may be affected by moon light intensity (Rich & Loncore 2006). Bird et al. (2004) found that beach mouse were less affected by bug lights then by low pressure sodium lamps in their foraging behaviour (598 nm). De Molenar et al. (2003) found that some species preferred to migrate under high pressure sodium lamps (550-650 nm), other avoided them - also found in juvenile pumas.
(Beier 1995) – while other species were not affected. Wallabies showed changed foraging and anti-predator behaviour under both white light and red light (Bruebouw & Blumstein 2003).

Some bats use lamp lit roads for foraging (Blake et al. 1994). Bats may prefer to use vision for foraging (Eklöf & Jones 2003), but it is unclear whether this explains the use of lamps for foraging, or that it is only a reaction on prey density. Anyhow, when orange road lamps are used that do not attract insects, bats no longer show an increased activity in these roads (Blake et al. 1994). Some species seem to avoid lamps (Rydell & Baagøe 1996; Alison Fure 2006). Artificial light might affect colony behaviour in that emergence can be delayed or prolonged in illuminated buildings (Sándor Boldogh et al. 2007). At light levels slightly above natural moonlight, migration behaviour along commuting routes might be disturbed (Kuijper et al. 2008).

### Table 5

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<th>General activities</th>
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<th>380</th>
<th>455-590</th>
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<td></td>
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<td></td>
<td></td>
<td>Interaction with chemical cues, period of lighting; intensity</td>
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<td>Interaction with age, time of day</td>
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<td>X</td>
<td>X</td>
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<td></td>
<td>Interaction with species</td>
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<td></td>
<td></td>
<td>X</td>
<td>Interaction with weather</td>
</tr>
</tbody>
</table>

| All               | +     | X   | X       | X       | X       | X       |      | X       |

*: from laboratory data; X: from field data

### Phototaxis (table 6)

Phototaxis is the movement of animals toward (attraction) or away (repulsion) from a source of light. Many animals show this behaviour and we have found relatively much information on it.

Flight to light behaviour is very well known for insects (Dufay 1964; Bowden & Morris 1975; Bowden 1982; Kolligs 2000; Frank 2006). The actual amount of insects found near a lamp depends on type of lamp, lamp density, and background illumination, such as moonlight (Bowden 1981, 1982; Kolligs 2000; Frank 2006; Robinson & Robinson 1950). Most moth species are attracted to all types of lamps (Frank 2006 gives an overview), except low pressure sodium lamps (589 nm) (Robinson 1952; Rydell 1992). Bishop et al. (2004);
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2006) showed that midges are attracted to uv, blue (475 nm) and green light (520 nm), but not to yellow (595 nm) and red light (640 nm). Remarkable is that also incandescent white light did hardly attract midges. This seems to contradict the findings of Ali et al. (1994) who found that midges were attracted strongest to white light. In this research yellow light also attracted many midges, but red did least. A strong correlation between attraction and light intensity was shown. Male glow-worms are attracted to green light (555 nm), the wave length of the signalling females. But this attraction was reduced when blue (485 nm) was added to the light (Booth et al. 2004). Some shrimps, sensitive to green light (520 nm), avoid artificial light in

| Table 6 |
|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|
| Phototaxis      | Ultra-Violet    | 360             | 400-500         | 500-600         | 550-600         | 600-700         | 650-750         | >750            |
| Insects         | +               | x               | x               | x               | x               | x               | x               | X               |
| Cephalopods     | +               | X               | x               | x               | x               | X               | x               | x               |
| Fish            | +               | x               | x               | x               | x               | x               | X               | X               |
| Amphibians      | +               | x               | x               | x               | x               | x               | x               | X               |
| Reptiles        | +               | x               | x               | x               | x               | x               | X               | X               |
| Birds           | +               | X               | X               | x               | x               | X               | X               | X               |
| Mammals         | +               | X               | x               | x               | X               | X               | X               | X               |
| Bats            | +               | X               | X               | X               | X               | X               | X               | X               |

X: from laboratory data; x: from field data

the field, while sandhoppers showed phototaxis in laboratory settings (Gal et al., 1999; Papi 2007). Lobsters showed no phototaxis toward red light (Weiss et al. 2006).

Fishermen use the attractiveness of light for fish while fishing at night, which is confirmed by research (Wickham 1973; Puckett & Anderson 1987; Oppedal et al. 2007; Nightingale et al. 2006; Haymes et al. 1984; Marchesan et al. 2005; Juell & Fosseidengen 2004). But some species avoid light (Contor & Griffith 1995; Van Aanholt et al. 1998). The actual phototaxis may depend on species, background illumination, water temperature, and season (Contor & Griffith 1995; Juell & Fosseidengen 2004; Marchesan et al. 2005; Oppedal et al. 2007). European seabass did not show phototaxis toward white light, but it showed repulsion for blue and green light, while the striped bream was attracted to white light at all illumination levels, but did not show any reaction to coloured light (Marchesan et al., 2005). Fish may show positive and negative phototaxis to red light (Patrick 1978; Weiss et al. 2006). Silver eels avoid sodium vapour lamps (Haymes et al. 1984).

Most amphibians show phototaxis, but whether it is positive or negative may depend


17
on light intensity (Hartman & Hailman 1981), life stage (Wise & Buchanan 2006), time of the
day (Sugalski & Claussen 1997), and wave length (Hailman & Jaeger 1974; Deutschlander et
al. 1999). Amphibians are often been said to have a 'blue preference'. When studying anura
species, Hailman & Jaeger (1974) and Hartman & Hailman (1981) found some kind of
phototaxis for violet (440 nm), blue (480 nm), green (530 nm), yellow, orange and red light
(650 nm), but most species preferred blue and green and were repulsed by violet and red.
Turtle hatchlings are strongly attracted by violet to green wave lengths, but either indifferent
or repulsed by longer wave lengths (Lohmann et al. 1997). Using filters that excluded wave
lengths lower than 570 nm did seem to reduce the attractiveness of lamps, but the effect was
strongly depended on light intensity and orientation clues, i.e., silhouettes (Salmon 2006;
Nelson 2002).

Birds are attracted by artificial lights (Evans Ogden 1996; Kraft 1999; Gautheaux &
Belser 2006). This may lead to bird mortality, but this seems to depend strongly on the
weather (Gautheaux & Belser 2006). Literature on coloured light is not clear: red and blue
light seem less attractive than white light (Wiese et al. 2001; Gautheaux & Belser 2006), but
Poot et al. (in press) found that birds were stronger attracted to white and red light than to
green and blue light, although this study makes no clear distinction between phototaxis and
disorientation.

Beier (1995) found that pumas showed a negative phototaxis toward urban lights,
while Kuijper et al. (2008) found negative phototaxis in bats. De Molenaa et al. (2003) found
no phototaxis toward high pressure sodium lamps for some mammal species and attraction
for other (550-650 nm).

Orientation (table 7)
Some animals have an internal compass for orientation during migration. This compass may
be disturbed by artificial light, resulting in disorientation of the animal.

The well known ‘captivity effect’ of insects that are unable to escape the near zone of
lamps, may be a result of such disorientation (Baker & Sadovy 1978; Soothidandhu & Baker
1979), although also other explanations for this phenomenon exist (Robinson & Robinson
showed no disorientation in UV light (365 nm), but were disoriented in blue light (500 nm).

Disorientation through artificial light is also known from amphibians, i.e., newts. This
was caused by wave lengths larger than 500 nm (Philips & Borland 1992), more specifically:
homing orientation remained under full spectrum, violet (400 nm and 450 nm), but was lost
under blue (475 nm), green (500 nm), yellow (550 nm) and orange light (600 nm) (Philips &
Borland 1992, 1994). Artificial light is also known to disrupt seaward orientation of sea turtle
hatchlings (Salmon et al. 1995b). This seems not the result of disruption of an intern
compass, but from the absence of dark silhouettes on the landward part of the beach (Salmon
& Wiltherington 1995). Adults are not disoriented by artificial light (Wiltherington 1997;
Salmon 2006).

Disorientation was studied for several bird species. Undisturbed orientation was found
under white, violet (424 and 443 nm), green (502 and 510 nm), and yellow light (565 nm),
disorientation under uv (373 nm), yellow (590 nm), orange (630 nm), and red light (660 nm),
but there seems to be an interaction with light intensity in that under high intensity,
disorientation may also occur at short wave lengths (Muoro et al. 1997; Wiltschko &
Wiltschko 2001; Rappel et al. 2000; Wiltschko 2007). Disorientation may be age dependent
(Gautheaux 1982). Gautheaux & Belser (1999) and Poot et al. (in press) claim to find
3.0 COMMENTS AND RESPONSES

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greater disorientation from red light (600-700, with a peak at 670 nm) than from blue (450 nm) and green light (530 nm) in field settings, but the distinction between phototaxis and disorientation is not clear in these studies.

Table 7

<table>
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<th>Orientation</th>
<th>Ultra-violet</th>
<th>Violet 380-450</th>
<th>Blue 450-510</th>
<th>Green 550-600</th>
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x: from laboratory data; X: from field data

3.3 Ecology

Populations (table 8)
Little is known about the effect of artificial light on populations. Egg-production is different under different light regimes in poultry (Davis et al. 1993; Siopos 1991; Siopos 2007) and fertility is affected by artificial light in rabbits under breeding conditions (Schudernage et al. 2000). Artificial light systems affect piglet mortality in pig breeding systems (O’Reilly et al. 2006). The decline in some Californian reptile species was correlated with a gradient in light pollution (Sullivan 2000) and De Molenaar (2000) found that Godwits avoided the vicinity of road lamps for nesting.
Table 8

<table>
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<th>Reproduction</th>
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<th>Visible 380-500</th>
<th>Blue 450-500</th>
<th>Green 500-550</th>
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</table>

x: from laboratory data; X: from field data

Interactions (table 9)

It has been suggested that artificial light might affect the competition between species, especially nocturnal specialists or species that avoid artificial light may suffer disproportional from it (Nightingale et al. 2006; Arlettaz et al. 2000), but such an effect seems not yet proven.

Joseph & Hering (1997) found that germination of spores of rust – a fungus parasite of plants – was delayed by all artificial light sources containing infra-red (700-800 nm), while Vallavieille-Pope et al. (2002) showed that infection efficiency increased under artificial light. Farmed salmons had an overall increase of lice infestation under artificial light (Hervy et al. 2003).

As fishermen use artificial light for fishing at night, predators of fish, including fish and mammals, are attracted to sources of artificial light, probably for the higher density of prey (Prinslow et al. 1980; Tabor et al. 1998; Tabor et al. 2001; Nightingale et al. 2006; Yurk & Trites 2000). The size of the fish eaten might change under artificial light (Elston &
3.0 COMMENTS AND RESPONSES

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Bachen 1976; Holzman & Genin 2003; Mills et al. 1986). Amphibians, reptiles and bats are known to occur at higher densities in the vicinity of lamps that attract insects (Baker 1990; Blake et al 1994; Rydell 1992; Rydell & Baagøe 1996). The change in the annual cycle of the pair of African bat hawks in an urban area suggest that these birds have changed their behaviour as a reaction on the higher density of bats near artificial light (Hartley & Hustler 1993).

Table 9

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<th>Predator-prey</th>
<th>UltraViolet</th>
<th>380</th>
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<th>500-550</th>
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</table>

x: from laboratory data; X: from field data

Predation of fish by fish, by mammals, and zooplankton by fish and predation of fish by lice; Interaction with prey size

See “general activities”


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4 Discussion
4.1 Introduction

As stated before, the above review of the effects of coloured light on nature is based on previous overviews, viz. De Molenaa et al. 1997, De Molenaa 2003 and Rich & Longcore 2006, supplemented with recent literature. Therefore it is not complete, especially as far as old literature is concerned. None the less, we think that table 10 gives a good overview of existing published knowledge. We deleted corals, not being terrestrial species, and added molluscs, being an important above ground terrestrial group.

<table>
<thead>
<tr>
<th>Table 10</th>
<th>Physiology</th>
<th>Behaviour</th>
<th>Populations</th>
<th>Interaction</th>
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</thead>
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<td>at least one source on light</td>
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<td>at least one source on spectral aspect</td>
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<td>mammals</td>
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In interpreting our results, one should take into consideration that not all knowledge is published, though. The motivation to publish negative results is probably much lower than that to publish positive results, both of authors and of journal redactions. So the fact that we did not come across literature on the effects of light of wave lengths larger then 500 nm on hormone regulation may not only indicate that no research is done, but also that no effects were found.

In many cases, results of research show interactions between the effect of the studied spectral part of light on the species with other factors. One obvious factor is the intensity of light, others are life stage of the species, season, density of the species, density of other

species, etc. This makes straightforward interpretation of effects complicated. Whenever possible we have tried to indicate these interactions in the tables 1-9.

Another complicating factor for interpreting our results is that much research we found was performed under laboratory conditions (table 11), while we are especially interested in effects in the field. In the field, many animals may be able to regulate their exposure to artificial light. That is why we regard phototaxis as being of special importance for our end goal: designing nature friendly outdoor lamps (see below).

<table>
<thead>
<tr>
<th>Table 11</th>
<th>no information on spectral aspects</th>
<th>Physiology</th>
<th>Behaviour</th>
<th>Populations</th>
<th>Interaction</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>laboratory studies</td>
<td>growth</td>
<td>hormone regulation</td>
<td>circadian rhythm</td>
<td>sleep &amp; time clock</td>
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<td></td>
<td>at least one source from field studies</td>
<td>growth</td>
<td>hormone regulation</td>
<td>circadian rhythm</td>
<td>sleep &amp; time clock</td>
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<tr>
<td>plants</td>
<td>phytoplankton</td>
<td>growth</td>
<td>hormone regulation</td>
<td>circadian rhythm</td>
<td>sleep &amp; time clock</td>
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<td></td>
<td>terrestrial plants</td>
<td>growth</td>
<td>hormone regulation</td>
<td>circadian rhythm</td>
<td>sleep &amp; time clock</td>
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<td>animals</td>
<td>invertebrates</td>
<td>spiders</td>
<td>hormone regulation</td>
<td>circadian rhythm</td>
<td>sleep &amp; time clock</td>
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<td>crustaceans</td>
<td>crustaceans</td>
<td>hormone regulation</td>
<td>circadian rhythm</td>
<td>sleep &amp; time clock</td>
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<td>molluscs</td>
<td>molluscs</td>
<td>hormone regulation</td>
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<td>sleep &amp; time clock</td>
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<td>vertebrates</td>
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<td>fish</td>
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<td>reptiles</td>
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<td>birds</td>
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<td>mammals</td>
<td>mammals</td>
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<td>sleep &amp; time clock</td>
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</tbody>
</table>

We did hardly come across studies of aspects of artificial light like polarisation, ultra sonar emissions of lamps, or armature. We think that these aspects need more attention. At least one study suggests the importance of polarisation in attracting aquatic insects (Krista et al. 2006) and we have noticed ourselves that some lamps emit ultra sonic sounds in the wave length region that is also used by bats.

4.2 Knowledge needed

We started our review stating that according to some authors (viz. Rich & Longcore 2006) much is still to be learned about the effects of light on nature, and we found that this is especially true for the effect of coloured light (i.e., specific wavelength) on nature. As a matter of fact, studies on the effect of coloured light on populations, species interactions, or communities are almost completely missing. However, we also found that for some species

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groups detailed information is available of the effect of certain wave lengths on physiology and behaviour. Might this information be enough to design nature friendly outdoor lamps, or at least formulate hypotheses on what wave lengths these lamps should not emit?

In theory this seems possible. If we need a lamp to be used in an area where only one species groups is of high conservation value and it happens that for this group the physiological or behavioural effects of coloured light is known, we could design such a lamp and study the ecological consequences when used in the field. Amphibians and birds seem species groups for which this could be true.

However, in most cases areas will have conservation value for a combination of species, and information should be available on the effect on all of these groups. Of course, we do not plead here for the design of lamps for every possible combination of species groups. A practical way of working could be that, based on the potential effects of coloured light on species, a limited number of typical landscapes are chosen and for each a lamp is designed. Such a typology of landscapes could start with the distinction between open and closed areas, because the scale of the effect of light will be different in these two types. A second distinction could be the presence of open water within the landscape. When not present, species groups like crustaceans and fish can be ignored. A further distinction could be the presence of a certain relatively rare group of animals, like reptiles.

Such a typology would not be able to prevent that certain species groups will turn out to be of conservational relevance in almost every type of landscape, such as insects, spiders, molluscs, amphibians, birds, mammals, and bats. This means that even for designing lamps for specific areas, knowledge for all these groups is crucial. Much of this knowledge is still missing.

So we need more research before we can actually design ecological friendly lamps. But which issues are the most urgent to be studied? In order to have some indication for this we tried to assess:
- Relative importance of the effects: in the end we are concerned with the ecological consequences of using the lamps. But the information to be used for the design of the lamps or for the formulation of hypotheses on the effects of the lamps is to be based on known effects on physiology and behaviour. So the question is how these effects are related to potential ecological effect.
- Relative importance of the species group concerned: not all species groups may have the same ecological vulnerability for a physiological or behavioural effect. Besides, different species groups may play different roles within a community.

Importance of effects

The following discussion of the relative importance of the effects focuses on both individual species and total communities of conservational importance.

For the conservation of vulnerable species, such as red list species, or species otherwise designated as of conservational importance, the survival of local populations is the main issue. This survival is directly correlated with the size of the population. Population size in an area is dependent on birth rate, immigration, death rate and emigration (sometimes referred to as the BIDE-model). Any potential effect of light on any of these parameters may also have effects on the population size of the species considered important for conservation, and should therefore be taken into consideration.

For the assessment of the potential effects on communities, we base our self on the recent discussion of the relative importance of niche partitioning and ecological drift for

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community composition (Hubbell, 2001; McGill et al. 2007). The ecological process
determining niche partitioning is competition and depends on the ecological differences
between species. Ecological drift is a so called neutral process, not depending on differences
between species, but on chances of colonisation and extinction of all the species in the
species pool. Most authors seem to agree now that both mechanisms are relevant, but that the
actual importance of each is still not known and may be different in different ecosystems
(McGill et al. 2007; Adler et al. 2007). At least some of the authors participating in this
discussion argue that niche partitioning may regulate the relative frequency of the species that
are abundant in the system, while ecological drift is determining the presence of rare species
(Ulrich & Ollik 2004). This would mean that the relative abundance of the common species is
mainly dictated by competition, while the species richness - that depends on the presence of
rare species - is mainly dictated by colonisation and extinction. Species interactions other
than competition, such as predator-prey or parasite-prey relationships, are here regarded as
affecting mainly birth and death rates, although the relative vulnerability of prey species for
predators/parasites/pathogens can also be regarded as an aspect of competition. Anyhow,
competition, dispersion (i.e. colonisation rate and for the individual species the net
immigration-emigration), and survival (i.e. reciprocal extinction rate and for the individual
species the net birth-death rate) are regarded here as the three key processes dictating species
population size and community composition.

Is it possible to translate the physiological or behavioural effects of light into effects
on these ecological processes? We will try to do that in the next section, but we should keep
in mind that the more reasoning steps we need for connecting the effects to the ecological
processes, the more speculative they are. As a consequence, the ecological consequences of
physiological effects are more uncertain than those of behavioural effects. This is
strengthened by the fact that almost all known physiological effects are from laboratorial
experiments, and not from field studies. For this reason we will give less weight to
physiological than to behavioural effects.

The ecological impact of effects of light on growth works typically through
competition: species will change in their ability to transform resources into biomass. This
ability will be different between species and therefore their relative competitive strength will
change. Changes in hormone regulation will probably also change competition, but it may
also directly effect reproduction if sex hormones, such as pheromones, are involved. We did
not come across examples of changes in mortality due to changed hormonal anti-herbivore
of anti-predator mechanisms, nor changed dispersal due to hormonal changes although these
also may occur. Changes in circadian clocks alter the time available for daily activities of a
species and seem again to work through competition when species have different shifts in
time available. Changes in circannual clocks will result in changes in the timing of seasonal
activities such as reproduction, migration and hibernation. Here a more direct relation with
dispersion and survival can be expected.

Under the heading general activities we have included all kind of behaviour, some
directly related to competition, such as feeding behaviour, some to reproduction, such as
mating behaviour, or mortality, such as anti-predator behaviour, and other to dispersal. For all
these types of behaviour we found examples of changes due to the effect of light. Differences
in phototaxis may result in changes in competition between species if some species avoid
light while others are attracted to it. It may also result in direct mortality due to collisions.
And for some species, it may result in barriers, so affecting dispersion. Phototaxis plays a
special role in the effects of light on species, because it may function as a kind of a multiplier:

when attracted from relative large distances to a light source, animals may expose themselves to light intensities that will also have other effects, such as hormonal changes or disorientation. This is especially true for flying animals that can come very close to a light source. By this mechanism, positive phototaxis may enlarge the area on which other effects of light work, while negative phototaxis may decrease it. Disorientation obviously affects migration, and thereby survival through exhaustion. But it can also result in direct mortality through collisions. Since migration is directed toward a specific location, such as winter habitat or breeding place, it is not the same as dispersion which can be regarded as the undirected change of living area. For such undirected movements, disorientation may not be relevant.

Importance of species groups
The relative importance of a species group can be assessed taking the conservation value of the species group into consideration. For example, the relative number of Red List species within the species group could be used, but also the public appeal of a species group. We do not apply this way of weighting here, because we think that the conservation value should be assessed at the level of species, not of species group.

A good way of assessing the relative importance of a species group could be by comparing the groups according to their vulnerability for the effects discussed above. Another way of looking at the importance of species groups is by looking at the relative dominance of the group within the community. We will work out both approach a little further.

As we stated before: all organisms are completely adapted to the natural light and it changes in their living environment. As a consequence, it is difficult to find differences between species groups in the importance of disturbing effects of artificial light on their physiology. One might think of a distinction between diurnal versus nocturnal species, a subdivision that in some cases follows group division, amphibians and mammals being mainly nocturnal, while reptiles and birds are in general diurnal, at least in our regions. But the suggestion that nocturnal species may suffer greater physiological disturbance from artificial light may not be true, since for example hormone production during the night might strongly be disturbed in diurnal species. Concerning behaviour, we stated that we regard flying animals as especially vulnerable for the multiplying effects of positive phototaxis. These are in our typology of species groups the insects, birds, and bats, and we will give extra weight to light impacts concerning these groups. Another distinction that can be made based on a high vulnerability to a certain light effect is the distinction between non-migrating and migrating species, the latter being special vulnerable to disorientation. The insects, fish, amphibians, birds and bats of the Netherlands include migrating species. These species groups will also be weighted extra. On the larger scale, some mammal species, like large herbivores, also migrate.

Another way of weighting species groups is by looking at the relative dominance of the groups within the community. By dominance we mean that a relative large part of the biomass within a trophic level might be produced by a certain group. Changes in such a group will probably affect the entire community, although it might not be clear how these changes affect biodiversity. This weighting is therefore speculative, and we regard it as of relatively small importance. The dominant species group of the primary producers are vascular plants in terrestrial systems and phytoplankton in aquatic systems. At the secondary level, we regard insects and mammals (mice) as dominant in terrestrial systems and zooplankton, especially small crustaceans, and fish as dominant in aquatic systems. All other

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groups we regard as non dominant.

Weights in summary (table 12)
The above discussed weighting results in table 12. Since reproduction, survival and
dispersion also affect competition, competition is always a potential effect.

4.3 Gaps in knowledge

The available information we came across during our study is represented in table 10. One
should keep in mind that the indication that information is available might be based on only
one single source. For example, we know of only one study of the phototaxis of crustaceans,
i.e., lobsters, toward red light. We did not come across any research on the effects of
coloured light on important crustacean groups of zooplankton, like the copepoda or the
cladocera.

By subtracting the available information, now restricted to the available information
on the effect of parts of the spectrum (table 11), from our weight-table, we can see were the

important gaps in information lie in the effects on physiology and behaviour that could be used to design nature friendly lamps or formulate hypotheses on the potential effects of such lamps on populations or communities (table 13). Again, it should be kept in mind that in the cells coloured green, the available information might be far from complete.

It should be no surprise that the effects of coloured light on ecological processes is almost completely unknown. Also effects on invertebrates are still largely unknown. Especially the spiders and molluscs are mostly ignored, but as said before, also the crustaceans in plankton deserve much more attention. For vertebrates, it is remarkable that disorientation in fishes, reptiles and mammals is not well studied. Also phototaxis of bats towards coloured light is not yet studied, but it should be noticed that even for birds, phototaxis is not yet very well studied, and a clear distinction between phototaxis and disorientation is usually not made in field studies.

4.4 A strategy for further study

From the above, it can be concluded that there is a need for research of the effects of coloured light on the ecological processes of all organisms. Preferably such research should be performed in field studies. What parts of the spectrum should be studied? The tables presented in our results give clues to hypothesize which colours might have relative low effects on which species groups.

As we have stressed, phototaxis might be regarded as a multiplier and therefore as of special importance to ecological effects in nature. As it happens, phototaxis is also the effect on which most literature is available. So, we think that phototaxis might be a good starting point to design the first generation of testing lamps. For example, based on phototaxis literature it should be possible to design outdoor lamps with an amphibian friendly spectrum.

These first generation lamps should then be tested in the field using a 'Before-After-Control-Impact-approach' (BACI). For that, locations where these lamps are applied should be compared before and after the application of the lamps with locations with common used standard lamps and locations with non-working lamps. Preferably locations are chosen of which the community is already well known. In these locations, not only the target species group - the amphibians of the above example - but also other relevant groups should be studied. A multi-trophic approach is recommended, so that all important groups of the community are taken into consideration. In all cases, the research should be focussed on trying to assess effects on survival, dispersion and competition.

Although field studies might show the effects on a variety of species groups of applying lamps with a certain spectrum, they will not do to explain the effects found. For that, additional laboratorial studies remain necessary, for example, in order to disentangle phototaxis and disorientation. Such research might also be fruitful for studying groups that are largely ignored up until now and are hard to study in the field, such as spiders, molluscs and small crustaceans.

4.5 Conclusions

Our knowledge of the effects of coloured light on the physiology, behaviour and ecology of plants, animals and communities is still far from complete. On the other hand, however, knowledge in some fields, such as phototaxis, seems to give enough clues to at least postulate a spectrum that might be of relatively low disturbance for a specific species group. Lamps can be designed based on these spectra and these lamps can be tested in the field. Any field study of the effects of coloured light on survival, dispersion or competition of species or species groups would be a considerable contribution to our knowledge.
5 Acknowledgement

We would like to thank Maurice Donners of Philips Lightning, Eindhoven, who made this study possible and who inspired us greatly with his enthusiasm. Discussions with Eddy van der Mey, Marcel Visser, Bruno Ens and Geert de Snoo set the general outline of this study. All members of the consortium ‘Ecologisch vriendelijke verlichting’ contribute to this study by discussing its results with an open mind. Jory Sjardijn and Edith Roos helped us in our literature search.
6 References


with higher levels of nocturnal illumination. Ethology Ecology & Evolution 15 (2): 159-172.


3.0 COMMENTS AND RESPONSES

Letter 8 Continued


Letter 8 Continued


Letter 8 Continued


3.0 COMMENTS AND RESPONSES

Letter 8 Continued


Kuiper, D.P.J.; Schut, J.; Dullemen, D. van; Toorman, H.; Goossens, N.; Ouweland, J.;

Letter 8 Continued


Letter 8 Continued


County of El Dorado
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Final Environmental Impact Report

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Letter 8 Continued

Research Division, Toronto.


Letter 8 Continued


Letter 8 Continued


3.0 COMMENTS AND RESPONSES

Letter 8 Continued

3.0 COMMENTS AND RESPONSES

Letter 8 Continued

Letter 8 – Cheryl Langley, Resident, Shingle Springs

Response 8-1:

The commenter includes a table that provides a comparison of the existing Sign Ordinance and the proposed Sign Ordinance based on the commenter’s interpretation of the respective codes. Based on this interpretation, the commenter asserts that the proposed ordinance is not more restrictive than the existing.

This is not a comment on the adequacy of the EIR, but a comment on the merits of the project.

Response 8-2:

The commenter refers to text from page 2.0-2 of the DEIR (not page 1.0-1 as noted in the comment) and notes the proposed Sign Ordinance “misses the mark.”

This is a comment on the proposed project and not the adequacy of the DEIR. It should be noted, however, that the comment refers to existing billboards, sign clutter, and mobile billboards. These are existing conditions that cannot be attributed to the proposed Sign Ordinance; therefore, the effects of these conditions were not evaluated in the DEIR. In addition, lacking that nexus to the project, the EIR cannot impose mitigation requiring the removal of those billboards (see Public Resources Code Section 21041(a)). Contrary to the comment, the proposed Sign Ordinance specifically prohibits billboards (Section 17.60.090[B][2]); however, digital signs would be allowed. Digital signs and other signs in other districts were assumed in the DEIR analysis.

Response 8-3:

The commenter expresses support for the existing sign ordinance.

The commenter is referred to DEIR Section 4.0, Project Alternatives, for a discussion of the No Project Alternative, which would be a continuation of the existing sign ordinance.

Response 8-4:

The commenter is of the opinion that the DEIR overstates the value of the statement on page 2.0-6 of the DEIR: “Establishes regulations for abatement or removal of illegal, abandoned, and nonconforming signs as allowed by state law.”

The commenter is referred to Section 17.16.100, Illegal, Abandoned, and Nonconforming Signs, of the proposed Sign Ordinance. The quoted text noted in the comment is from the Project Description of the DEIR. The Project Description does not include analysis or suggest any “value” for any particular project component.

Response 8-5:

The commenter disagrees with the statement in the DEIR that because the Sign Ordinance is a policy document it would not result in direct physical impacts. The comment also refers to maintaining and enhancing the visual appearance of the county, promoting economically stable communities, and protecting viewsheds.
While the DEIR concluded that the proposed Sign Ordinance would not result in direct physical effects (because approval of the Sign Ordinance would not directly result in approval of new signs), the indirect physical effects of implementation of the Sign Ordinance were considered in the DEIR. What is intended by the references to “enhance, protect, and protect” is that the County needs to balance the need for necessary advertising and direction in the county to ensure a stable and productive economic environment with the protection of the visual resources in the county. While the allowance for signs in the county would certainly change the county’s visual character, these changes were considered in the DEIR. It should also be noted that any change is not necessarily a substantial negative change.

Response 8-6:

The commenter requests photographs of sign types that would be allowed and not allowed.

As discussed in response to Comment A-3 regarding the inclusion of photographs or visual simulations in the DEIR. Because the EIR must review the project in a programmatic manner, to provide specific examples in the EIR would illustrate signs in locations that may never be proposed. Given the uncertain nature of sign types and locations, it would be speculative, and could be considered misleading, to provide examples for which the EIR would be required to draw significance conclusions.

Response 8-7:

The commenter states that digital billboards could impact biological resources. The commenter also included technical papers related to potential impacts on birds, bats, and insects due to lighting.

See Response to Comment 10-2 regarding prohibitions for billboards. The papers submitted by the commenter are related to lighting generated by street lighting, floodlights, and general information related to artificial light. The proposed Sign Ordinance does not regulate street lighting or floodlights, and the type and quality of light from these sources would differ from that of digital signs, given the intent of the former is to illuminate an area rather than convey a message, as is the case for a sign. In addition, because signs would generally be associated with commercial and industrial uses in developed areas of the county, these areas would already be subject to artificial light, such as parking lot lighting and lighting generated at buildings. Therefore, given the character of the light from a digital sign compared to that of other types of lighting in developed areas, there would not be a substantial change in lighting such that there would be a negative effect on protected bird, bat, or insect species.

Response 8-8:

The commenter requests corrections to the commenter’s Table 1 (see Comment 10-1).

This is not a comment on the adequacy of the EIR, but a comment on the merits of the project.

Response 8-9:

The commenter questions how the proposed Sign Ordinance is more protective of scenic resources than the existing Sign Ordinance if it would allow more signs to be erected than the existing Sign Ordinance.
The basis for the conclusion that the proposed Sign Ordinance would allow more signs than the existing Sign Ordinance is not provided. It is assumed that signs would be erected under the existing Sign Ordinance if the proposed Sign Ordinance is not approved. There is no evidence to suggest that the proposed ordinance would result in more signs overall compared to the existing Sign Ordinance.

Response 8-10:

The commenter questions why the No Project Alternative was not considered the environmentally superior alternative.

As noted on DEIR page 4.0-2, the No Project Alternative would continue the implementation of the current Sign Ordinance, which resulted in construction of the billboards and sign clutter noted by the commenter as objectionable. In addition, the No Project Alternative would not achieve the project objectives.

Response 8-11:

The commenter requests information on how the existing Sign Ordinance is inconsistent with the General Plan.

This is not a comment on the adequacy of the EIR, and no response is required. It should be noted, however, that the DEIR does not rely on assumptions regarding consistency or inconsistency of the existing Sign Ordinance for the EIR analysis.

Response 8-12:

The commenter requests photos of signs to be included in the EIR.

See response to Comment 10-6.

Response 8-13:

The commenter requests state law language that allows the County to remove nonconforming signs.

This is not a comment on the adequacy of the DEIR. As noted in response to Comment 10-2, the referenced billboards are existing signs that cannot be attributed to the proposed Sign Ordinance.

Response 8-14:

The commenter requests clarification on the term “abatement.”

This is not a comment on the adequacy of the DEIR. Abatement procedures are related to remedying existing conditions and are not a result of the proposed project.

Response 8-15:

The commenter requests information on the amortization schedule for removing nonconforming billboards.
See response to Comment 10-2 regarding billboard removal. Removal of existing billboards is related to remedying existing conditions and is not a result of the proposed project.

Response 8-16:

The commenter requests responses to comments submitted by the commenter on the Notice of Preparation (NOP) “that were not responded to in the DEIR.”

The DEIR considered all comments submitted on the NOP during preparation of the EIR.

Response 8-17:

The commenter requests a discussion of possible impacts on biological resources from lighted signs.

See response to Comment 10-7 regarding potential for impacts on special-status species due to digital signs. While the DEIR conservatively assumed that there could be more digital signs, the flexibility of digital signs, with the ability to change the message without making physical alternations to the sign, could actually reduce the demand for traditionally lighted signs and may reduce the overall area of signs. In addition, as discussed in response to Comment 10-7, the light from a digital sign is not focused as it is for an indirectly lighted sign, so the lighting would be less intense. For these reasons, the proposed Sign Ordinance would not result in a substantial change in lighting such that there would be a negative effect on protected bird, bat, or insect species.
Letter 9
Anne Novotny <anne.novotny@edcgov.us>

Sign Ordinance comment
1 message

dwimonnes@aol.com <dwimonnes@aol.com> Tue, Feb 17, 2015 at 10:58 AM
To: anne.novotny@edcgov.us

Hello Anne,

My name is Karen Warner, Shingle Springs.

I attended the Sign Ordinance meeting, January 29th. I was quite surprised to see how many of the residents had concerns regarding the proposed signs within our county.

I asked the gentleman, who was speaking, how the study in identifying and analyzing the possible impacts on the environment is done. He was quite silent for a bit then continued to explain. However, his explanation was not clear enough for me. I need clarity. How exactly is it done? And if so what were your findings?

Also, what would be the moving signs? And what would be the flashing signs? Where would they be?

Have you conducted a study on the safety of these signs as to the location of traffic? Would these signs be put in the unincorporated areas of the county? And if so would they be consistent with the 2004 General Plan’s visual and aesthetic goals?

Lastly, how do you poll the county? What are your methods of polling? Do you employ from within the county?

Thank you for your attention regarding these questions. I believe I speak for hundreds, if not thousands of my neighbors here within county who are quite sensitive to the dark sky at night.

Thank you,

Karen Warner
LETTER 9 – KAREN WARNER, RESIDENT, SHINGLE SPRINGS

Response 9-1:

The commenter requests clarification as to how the environmental analysis of the project was conducted and what the findings were.

The commenter is referred to DEIR Section 1.0, Introduction, which describes the purpose, organization, and scope of the DEIR. The commenter is also referred to DEIR Section 3.1, Aesthetics, which provides an overview of the environmental setting related to aesthetics, discusses significance thresholds used to determine the level of potential impacts, describes the methodology used in evaluating project impacts, provides an assessment of the individual and cumulative impacts of the proposed project, and provides mitigation measures that would reduce or eliminate those impacts. The DEIR found that the proposed project could result in a significant and unavoidable impact by creating new sources of nighttime light (see DEIR page 3.1-11) and contribute to cumulative light impacts.

Response 9-2:

The commenter inquires about moving and flashing signs and where these signs would be located.

The proposed Sign Ordinance prohibits animated, flashing, scrolling, digital, or video screen signs where the message is displayed for less than 8 seconds (dwell time) before changing to a different message (see Sections 17.16.070(H)[3] and 17.16.090(B)[4]). A minimum dwell time of 8 seconds would in effect prohibit all flashing and moving signs. No specific signs are proposed as part of the Sign Ordinance, but the proposed Sign Ordinance update would apply to all new and modified signs located throughout unincorporated El Dorado County.

Response 9-3:

The commenter asks if the County has conducted a study regarding the effect of signs on traffic safety.

A traffic safety study was not conducted as part of the proposed project. The proposed Sign Ordinance is intended, in part, to improve traffic safety. For instance, per Section 17.16.070(E)(3) (Interference with Motorist Field of Vision), no sign is to be located in a manner that would obstruct or interfere with view of a traffic signal or other traffic regulatory agency sign. The proposed Sign Ordinance provides further standards for US Highway 50-oriented signs related to location, spacing, and illumination to minimize driver distraction.

Response 9-4:

The commenter asks if signs subject to the proposed Sign Ordinance update would be installed in the unincorporated areas of the county and if they would be consistent with the visual and aesthetic goals of the County's General Plan.

The proposed Sign Ordinance would apply only to those signs located in the unincorporated portions of the county. The proposed sign standards would not apply in the county's two incorporated cities, Placerville and South Lake Tahoe. As discussed on DEIR page 1.0-1, the purpose of the proposed Sign Ordinance update and General Plan Amendment is to ensure...
signs are consistent with the visual and aesthetic goals and policies set by the El Dorado County General Plan.

Response 9-5:

The commenter asks how polling of county residents was conducted as part of the proposed project.

No polling was conducted as part of the proposed project. The commenter is referred to DEIR subsection 2.3.1 on page 2.0-2 and subsection 1.3 on pages 1.0-1 and -2. Public input on the project was obtained in the form of oral and written comments submitted to the County. Prior to release of the NOP for the DEIR, the County held a total of eight public meetings in which the public could provide comments on the draft Sign Ordinance. Six public meetings were held in August 2013, and two board meetings (December 17, 2013, and July 22, 2014) were held to discuss project updates.
Comments to Draft EIR for Sign Ordinance

1 message

Costello, Timothy <Timothy.Costello@tetratech.com>  Tue, Feb 17, 2015 at 1:54 PM
Tel: "anne.novotny@edgegov.us" <anne.novotny@edgegov.us>

Ms. Novotny,

I am providing comments to the Draft EIR for the El Dorado County Sign Ordinance Update, dated December 2014. I'm sending this email from work, as the deadline for submitting comments is 5PM today. I understand that comments are to address the content of the Draft EIR document (evaluations of environmental impacts), and are not to address the negative attributes of the signs themselves at this time.

My contact information is as follows:

Tim Costello
3903 Los Padres Lane
Shingle Springs, 95682
530-872-1455
ntcostello@tbcglobal.net

Comments:

1. Thank you for providing the Draft EIR for review and comment.

2. The sole environmental impact evaluated in the Draft EIR is aesthetics and visual resources. I appreciate the emphasis on protecting viewsheds and scenic corridors, and the stated objectives of maintaining and enhancing the County’s visual appearance; promoting signs that harmonize with the physical character of the environment, maintaining the visual integrity of hillside and ridgeline, reducing visual clutter, attempting to regulate light pollution, etc.

a. Scenic vistas/ viewpoints should be protected from obtrusive signs such as billboards. The scenic vistas and viewpoints defined in Table 3.1-1 should be protected from all billboards, lighted signs, etc.; such protections should not be limited to only the defined scenic highways designated by Caltrans as defined on Page 3.1-2. For example, the existing lighted billboard on eastbound Highway 50 just past the Ponderosa Road exit should never have been approved, as it mars the iconic view of the Crystal Range as one ascends the hill at the Ponderosa overpass. That view is included in Table 3.1-1, and as such I presume would be protected against large signs. Additionally, there are obviously many scenic views along both state highways and county roads in addition to those defined in Table 3.1-1 – that table should not be exclusive and should not prevent other scenic areas from being protected against billboards, large signs, and lit signs.

b. Section 2.3.3 on Page 2.0-6 should include billboards located in all areas defined in Table 3.1-1, not just those located within the Caltrans define scenic highways. I’m concerned that the term “designated” that was added in this section narrows the areas subject to this General Plan.
Amendment, possibly as a result of threatened litigation on the part of sign companies (see the published prior comments). Also, is the amortization schedule previously put forth to eliminate billboards no longer on the scale? And how does the term “designated scenic corridors” (Section 2.3.3, Page 2.0-6) equate to “Scenic Vistas”, “Scenic Views”, and “Scenic Resources” as listed in Table 3.1-1? Is the ability of the County to regulate billboards along “Designated Scenic Corridors” less than their ability to regulate billboards within areas defined in Table 3.1-1? If so, I would like Section 2.3.3 changed to be more inclusive, and provide the County the ability to eliminate billboards in all scenic areas, not just those that are “Designated Scenic Corridors”.

I find the discussions of lit signs confusing; I’m not sure if externally lit signs are allowed (such as those on large billboards). If externally lit signs on large billboards are allowed, the lights should be pointed DOWNWARD, and not up as currently configured on large billboards — the light bounces off those signs and illuminates the sky above, resulting in significant loss of the night sky in those areas — I live not far from the Ponderosa Road interchange and the night sky is impacted by the lights from the large billboard and other lit signs at that location. Further, one light on the east side of that billboard remains mis-aligned and points up and over the billboard – the alignment is readily visible during foggy evenings. Downward facing lights would help reduce loss of our night sky.

Digital LED lit signs should not be allowed because they are a blight and are more distracting than non-lit signs. The brightness definition is a function of the square footage of the sign, and is not easily understood. 0.3 foot-candles is not an intuitive unit. Introducing digital signs and LED signs is a big step in the wrong direction, if the stated goal of the sign ordinance update is, in fact, enhancing the County’s visual appearance.

I agree with the finding that light and glare generated from digital signs will result in significant environmental impact. The mitigation measure (light < 0.3 foot-candles), however, is not reasonable because the resulting light will still result in a significant visual impact. The new sources of light and glare will adversely affect nighttime views and contribute to the loss of our night sky. Impact from digital signs will be “significant and unavoidable” (Page 3.1-11). However, the impact is avoidable – prevent digital signs in the first place. I ask that digital signs, especially on billboards and large signs, not be allowed.

The evaluation of digital signs does not include a metric for annoyance and blight, and therefore falls short in my opinion. Digital signs are disgusting, distracting, and an affront to the visual characteristics we value and hope to protect. The very nature of digital signs conflicts with the stated objectives of the sign ordinance update, and for that very reason, should prevent such signs from being allowed.

Page 4.0.2 concludes that the Environmentally Superior Alternative is the “No Digital Signs Alternative”. I agree and request that this finding be honored and digital signs not be allowed.

3. Thanks again for proceeding with the sign ordinance update in an attempt to improve the County’s visual character, eliminate billboards, protect our scenic viewsheds, and hopefully prevent digital signs and any large lit sign.

Tim Costello
Letter 10 Continued

Draft EIR Comments to the County Sign Ordinance Update - TYPO CORRECTION

1 message

Costello, Timothy <Timothy.Costello@retrievec.com> Tue, Feb 17, 2015 at 2:14 PM
To: "anne.novotny@edc.gov.us" <anne.novotny@edc.gov.us>

Ms. Novotny,

I just submitted my comments on the Draft EIR for the County Sign Ordinance Update, I discovered a typo on my home email address —

My email is ntcostello@sbcglobal.net

I had an "y" in my last name in my email address when I typed out my contact info in the email I just sent. Please note my correct email address above. Thank you. (can't believe I mis-typed my own last name...).

Tim Costello.
LETTER 10 – TIMOTHY COSTELLO, RESIDENT, SHINGLE SPRINGS

Response 10-1:

The commenter expresses the opinion that all scenic vistas and viewpoints in the county should be protected from visual impacts of signage, not just those designated by Caltrans as scenic highways or those identified in DEIR Table 3.1-1. The commenter references an existing sign along Highway 50 near the Ponderosa Road exit as an example of a sign impacting a scenic vista in the county.

DEIR Table 3.1-1 is intended to provide a summary of the most prominent scenic resources in the county and is not an exhaustive list of resources that could be considered scenic. As described on DEIR page 3.1-8, the proposed Sign Ordinance includes several regulations that address signage in public areas available for viewing scenic resources. For instance, Section 17.16.090 would prohibit new billboards, so billboards would not obscure or limit the field of existing views. This section would also prohibit signs placed on the public right-of-way. Section 17.16.070 would provide design standards for permitted signs, including those oriented to US Highway 50, with limits on maximum quantity, sign area and height, and sign placement and spacing. Enforcement of these standards would ensure that future signs installed in the county would not result in a substantial adverse effect on scenic vistas.

Regarding the existing sign located near the Highway 50 Ponderosa Road exit, this sign is part of the existing conditions of the county. While the DEIR considers the existing conditions in the county for the analysis in the DEIR, the existing conditions are not a result of the project.

Response 10-2:

The commenter states that the proposed General Plan Amendment, requiring the removal or relocation of billboards located within designated scenic corridors, should apply to all billboards in the county and speculates as to the reason the proposed amendment is limited to designated scenic corridors.

The comment does not address the adequacy of the DEIR.

Response 10-3:

The commenter inquires about the intent of the amortization schedule for removing nonconforming billboards.

The comment does not address the adequacy of the DEIR. The commenter is referred to Responses 10-2 and 10-15.

Response 10-4:

The commenter requests clarification on how the term “designated scenic corridors” relates to scenic vistas, views, and resources and how the ability of the County to regulate billboards within these areas differs.

The term “designated scenic corridors” refers to corridors in the county that have been officially designated by the state under Caltrans’ Scenic Highway Program or by the County under its proposed Scenic Corridor Ordinance. As described on DEIR page 3.1-2, segments of US Highway 50 and State Route 89 in El Dorado County are officially designated state scenic highways. The
County has not yet officially designated any scenic corridors. Official designation of a scenic corridor by the state requires the local governing body to enact a corridor protection program that protects and enhances scenic resources along the highway including the regulation of signs. Undesignated scenic resources are not regulated but may be subject to general plan policy and are considered during CEQA review.

Response 10-5:

The commenter requests that the proposed General Plan Amendment be broader to allow the removal of billboards in other scenic areas of the county.

The comment is noted.

Response 10-6:

The commenter inquires about standards for externally lit billboards and other large signs, states that external lighting should be directed downward, and refers to the existing billboard located near the US Highway 50 Ponderosa Road exit.

Billboards would be prohibited under the proposed Sign Ordinance update. Ordinance Section 17.16.070(A) requires all external sign lighting to be directed toward the sign and fully shielded to limit illumination to the sign itself. Per Sign Ordinance Section 17.16.070(J)(6), US Highway 50-oriented signs would be required to be internally lit. Regarding the existing sign located near the Highway 50 Ponderosa Road exit, the commenter is referred to Response 12-1.

Response 10-7:

The commenter opposes digital signs and states the brightness definitions used in the DEIR are not easily understood and the units are not intuitive.

The commenter's opposition to digital signs is noted. Regarding the brightness definitions and light units used in the DEIR, the EIR preparers attempt to make the document as accessible to the public as possible. However, certain topics, given their inherent complexity, are not easily translated to readily understandable terms.

Response 10-8:

The commenter states that DEIR mitigation measure 3.1.4 would not fully reduce project impacts related to light, as light would still be generated by signs potentially illuminating the night sky. The commenter states that the impact could be avoided by prohibiting all digital signs in the county.

The DEIR acknowledges that light generated by digital signs (Impact 3.1.4) would remain significant and unavoidable with implementation of mitigation measure 3.1.4 (see page 3.1-11). The DEIR evaluates the No Digital Signs Alternative on page 4.0-2 under which all digital signs would be prohibited and concludes that this alternative is the environmentally superior alternative. The comment is forwarded to the decision-makers for their consideration.

Response 10-9:

The commenter states that the evaluation of digital signs provided in the DEIR is inadequate because it does not include a metric for annoyance and blight. The commenter expresses dislike
of digital signs and states that such signs are inconsistent with the objectives of the proposed Sign Ordinance update and should be prohibited.

Visual annoyance is a subjective concept which varies by person and for which there is no established metric. The comment is forwarded to the decision-makers for their consideration. The commenter is referred to Response 3-1 regarding visual blight.

Response 10-10:

The commenter agrees with the DEIR conclusion that the environmentally superior alternative is the No Digital Signs Alternative and requests that this alternative be selected and digital signs be prohibited.

The comment is noted.
Letter 11

Anne Novotny <anne.novotny@edcgov.us>

Public Comment for Draft EIR Sign Ordinance

1 message

SOC admin <edcgov@live.com> Tue, Feb 17, 2015 at 3:05 PM

To: "anne.novotny@edcgov.us" <anne.novotny@edcgov.us>

Dear Anne,

Please acknowledge receipt of the attached comments.

Thank you,

Sue Taylor

Public comment DEIR Sign Ordinance 2-17-15.docx

35K
Letter 11 Continued

February 17, 2015

Anne Novotny
Senior Planner
anne.novotny@edcgov.us

Re: Public comment for El Dorado County Sign Ordinance

Initially, the public addressed the Board of Supervisors, asking them to implement the policies and goals of the General Plan in regards to signs and lighting. This was a direct result of the incompatible billboards that were installed along Highway 50 in Shingle Springs and Cameron Park. It was assumed that the Board of Supervisors directed staff to implement that request. Rather than implementing General Plan Objectives 2.7.1 Signs Regulation and 2.8.1 Lighting Standards, staff has taken it upon themselves to rewrite the entire Chapter 17.16 Sign Regulations in the El Dorado County Zoning Ordinance and are amending the objectives and policies of the General Plan, as clearly stated in the DEIR Project Overview.

The following is a direct quote from the County's webpage regarding the Sign Ordinance Update, which is located at:

"Sign Ordinance Update

On December 31, 2014, a Notice of Availability (NOA) of a Draft Environmental Impact Report (DEIR) for the Sign Ordinance Update was released for a 45-day public review and comment period. The purpose of this comment period is to solicit comments from public agencies and interested parties/persons regarding the content of the DEIR and potential environmental impacts that may result from the project implementation, not the positive or negative attributes of the proposed project itself.

- Notice of Availability of Draft EIR 12-31-2014
- Draft EIR Sign Ordinance Update December 2014
- Draft Sign Ordinance Update 10-01-14 Revised 12-11-14 (Appendix B in the Draft EIR)
- Errata Sheet 01-07-15 - list of revisions to the 10-01-14 Draft Sign Ordinance Update released with the Notice of Preparation (NOP). These revisions are included in the Draft Sign Ordinance Revised 12-11-14 (Appendix B in the Draft EIR). The 10-01-14 Draft Sign Ordinance Update and NOP are in the Supporting Documents tab below."

Environmental Impact Reports (EIRs), although largely technical documents focusing on the physical environment, are intended to provide an opportunity for public participation in the decision-making process for proposed projects and to provide the public and decision makers with full information about the impacts of a project. Thus, the EIR process serves as a framework for public dialogue about the adverse impacts, as well as the merits, of proposed projects.
3.0 COMMNETS AND RESPONSES

Letter 11 Continued

According to CEQA, all comments have to be considered during the public comment process; however, the lead agency is only required to respond to those commenting on the EIR not the project. The County's statement on its website that negative or positive attributes of the project are not to be submitted as part of this process, discourages public input. The County is actively subverting public comment by advising against submitting such comments. This is clearly demonstrated in Section 1.4 of the DEIR.

The new regulations in reference to signs being "attractive," are too subjective to regulate. The public requested photographs and pictures to give reference in order to analyze aesthetics. Staff stated that providing photographs is beyond the scope of the document. Given that "attractive" is in the eye of the beholder, an urban planner's vision of a sign may not be compatible to the vision of the rural residents of El Dorado County. Therefore, in dealing with aesthetics, photographs and pictures must be provided for the public to fully participate.

According to CEQA, a project description must be accurate. The DEIR provides two separate Project Overviews, one in the Introduction and one in the Project Description. This makes it confusing as to what the public is to address.

2.1 Project Overview of the Project Description, states "The proposed update provides for the use of moving signs, such as barber poles or electronic (digital) signs that may use animation, flashing, scrolling, or video screens under certain conditions, whereas the existing Sign Ordinance specifically prohibits all flashing or moving signs." It also states, "The proposed Sign Ordinance update would provide sign regulations for signs in the unincorporated areas of the county that are consistent with the goals and objectives of the El Dorado County General Plan (2004) and the community's visual and aesthetic goals." Since the existing Sign Ordinance specifically prohibits any flashing or moving signs, the last statement is inaccurate and in direct conflict with Goal 2.8 of the existing General Plan.

The meeting on January 29, 2015 was not informative. There was no discussion by the consultants or staff. They made it very clear that they were only there to receive comments from the public. At times the consultants were not helpful when the general public attempted to get answers to their questions. Staff became almost argumentative when attendees attempted to get answers to their questions. The public that was new to the process was completely confused and frustrated by the way this meeting was handled. It was not an environment that was conducive to providing opportunity for public participation.

The Draft Sign Ordinance has many more regulations than the current Sign Ordinance about different types of signs and where they can be located in the County. By adding more regulations, the County is creating more opportunity for litigation to be filed against the County and its citizenry.

Section ES.7 of the DEIR (listed below) illustrates that the Draft Sign Ordinance is in complete conflict with the El Dorado County General Plan, specifically Policy 2.8.1.1, also listed below.

ES.7 SUMMARY OF ENVIRONMENTAL IMPACTS
Table ES-1 lists project and cumulative impacts. The proposed project could result in significant
Letter 11 Continued

effects related to the allowance for new digital signs in the County; there are no other significant and unavoidable impacts of implementing the proposed project. The proposed project’s contribution to light and glare under cumulative conditions would be cumulatively considerable; the project would not result in any other cumulatively considerable impacts.

Policy 2.8.1.1 Development shall limit excess nighttime light and glare from parking area lighting, signage, and buildings. Consideration will be given to design features, namely directional shielding for street lighting, parking lot lighting, sport field lighting, and other significant light sources, that could reduce effects from nighttime lighting. In addition, consideration will be given to the use of automatic shutoffs or motion sensors for lighting features in rural areas to further reduce excess nighttime light.

A huge frustration for the public was that staff marched through their process for creating the draft Sign Ordinance and followed all of the steps, without truly considering the concerns that were brought up along the way. It was as if the public was brought along for the ride but was not able to give any direction. For example, an updated draft was posted to the County website on 7-18-14, and that draft was to be accepted for environmental review at the 7-22-14 Board meeting. That gave the public only 4 days over a weekend to review the most current draft and provide the Board with input. Despite many emails and public testimony to provide the public with more time to review the new draft, the staff persuaded the Board to continue on, stating that the public would get other opportunities to provide input.

By this document, the County is classifying all Community Regions as urban, even though many have zoning districts within that are rural. Presently, the existing Sign Ordinance recognizes standards based on zoning districts, rather than land uses. By changing the way in which this Sign Ordinance will be implemented, Impacts 3.1.1, 3.1.2, and 3.1.3 will be significant due to rural zoning districts conflicting with new urban designations. These impacts will also be significant since the Scenic and Historic Road Ordinance is not being implemented at this time. Therefore this project will still impact scenic vistas, the visual character, and scenic resources.

Enacting this policy is going to be punitive to the existing rural communities. Much of the regulations being put into place are to regulate rural signage. The people most impacted by this have not been clearly notified. This goes against the custom, cultural, and economic stability of El Dorado County. Given that the Board of Supervisors have stewardship over these assets that maintain our rural character, it is their duty to protect those most vulnerable to the regulations. Therefore, this General Plan Amendment and rewrite of the Zoning Ordinance must not take place. As stated by a past Agricultural Commissioner, ‘One man’s barrier is another man’s protection.” One last time, we are asking the Board of Supervisors to implement Policy 2.7.1.2, to being the process of amortization and elimination of the billboards on our scenic corridors. Period.

Other policies and goals that are conflicting with this DEIR: Policy 2.6.1.5 All development on ridgelines shall be reviewed by the County for potential impacts on visual resources. Visual impacts will be assessed and may require methods such as setbacks, screening, low-glare or directed
Letter 11 Continued

lighting, automatic light shutoffs, and external color schemes that blend with the surroundings in order to avoid visual breaks to the skyline.

GOAL 2.7: SIGNS

Regulation of the size, quantity, and location of signs to maintain and enhance the visual appearance of the County.

OBJECTIVE 2.7.1: SIGNS REGULATION

Regulation of the location, number and size of highway signs and elimination of billboards along identified scenic and historic routes.

Policy 2.7.1.1 The Sign Ordinance shall include design review for signs within the foreground and background of the designated scenic corridors commensurate with the goal of scenic corridor viewshed protection.

Policy 2.7.1.2 Existing billboards within scenic corridors shall be removed or relocated out of the corridor allowing an adequate time period for billboard owners to amortize the value of their signs pursuant to an amortization schedule to be included in the Sign Ordinance.

Sue Taylor
Save Our County
Response 11-1:

The commenter provides background for the project and the environmental review process.

This is not a comment on the adequacy of the EIR. No response is required.

Response 11-2:

The commenter states that the County’s request that commenters on the DEIR limit their comments to environmental issues, and not comments on the Sign Ordinance itself, discourages public input. The commenter also generally refers to Section 1.4, but does not provide any information with respect to how that discourages public input.

CEQA Guidelines Section 15204 states, “In reviewing draft EIRs, persons and public agencies should focus on the sufficiency of the document in identifying and analyzing the possible impacts on the environment and ways in which the significant effects of the project might be avoided or mitigated.” As noted in the commenter’s introduction (see Comment 1), the focus of the environmental process is on physical environmental effects. The County held several meetings in which the proposed Sign Ordinance was discussed, and public input will be accepted when the Sign Ordinance update is heard by the Planning Commission and the Board of Supervisors. The request that commenters on the DEIR limit their comments to environmental issues was intended to prevent a debate regarding the merits of the project rather than input on the project’s potential physical environmental effects.

Response 11-3:

The commenter states that a reference to signs being “attractive” is too subjective to regulate and that photos must be required to allow the public to participate.

Recognizing the subjective nature of aesthetics, the DEIR does not rely on “attractiveness” in reaching a determination about visual impacts. The DEIR considers compatibility with adjacent uses as the determining factor as to whether signs would be out of character. Given that signs would generally be associated with a commercial use the addition of a sign would not be out of character with those uses. The exception to this would be commercial uses located on private property in the designated rural areas of the county that are not directly abutting County roads. These uses would be allowed one nonilluminated commercial identification and directional sign with a maximum sign area of 16 square feet and a maximum height of 12 feet. Such a sign would not be considered to have a substantial negative effect.

Response 11-4:

The commenter states that since flashing and moving signs are prohibited in the existing Sign Ordinance, allowance of such signs would be inconsistent with the General Plan.

The proposed change to the Sign Ordinance to allow moving signs in certain locations would not necessarily result in an inconsistency with the General Plan as the General Plan does not include specific prohibitions for flashing or moving signs. It should be noted that the proposed Sign Ordinance does not contain references to barber poles or moving signs. The text in the second paragraph on DEIR page 2.0-1 is amended as follows:
The proposed update provides for the use of moving signs, such as barber poles or electronic (digital) signs that may use animation, flashing, scrolling, or video screens under certain conditions (e.g. signs shall not change message more than once every 8 seconds), whereas the existing Sign Ordinance specifically prohibits all flashing or moving signs.

Response 11-5:

The commenter states the meeting January 29, 2015, was not informative and there was no discussion with staff or the consultant.

Prior to release of the NOP for the DEIR, the County held a total of eight public meetings in which the public could provide comments on the draft Sign Ordinance. Six public meetings were held in August 2013, and two board meetings (December 17, 2013, and July 22, 2014) were held to discuss project updates. Regarding the EIR process, as stated in the Notice of Availability for the Draft EIR, the purpose of the meeting on January 29 was to “accept comments on the DEIR.” The meeting was held approximately one month after the beginning of the public review period to allow members of the public adequate time to review the DEIR and generate comments with respect to its adequacy.

Response 11-6:

The commenter states that the number of regulations in the proposed Sign Ordinance could lead to more litigation.

This is not a comment on the adequacy of the EIR. No response is required.

Response 11-7:

The commenter refers to potential for inconsistency with General Plan Policy 2.8.1.1 due to the potentially significant impact related to light from digital signs.

The policy states, “Development shall limit excess nighttime light and glare from parking area lighting, signage, and buildings.” The policy does not prohibit light from signs. With respect to digital signs, as noted in response to Comment 10-7, the character of the light from a digital sign would differ substantially from light generated by sources specifically noted in Policy 2.8.1.1 (i.e., street lighting, parking lot lighting, and sport field lighting) in that light from digital signs would be less intense and is not intended to cast light to illuminate a large area. Based on the evaluations contained in the EIR, staff and the EIR consultant concluded the proposed project is generally consistent with the County General Plan. However, while the EIR determined that the proposed project is consistent with the General Plan, the Board of Supervisors makes the final determination of consistency.

Response 11-8:

The commenter expresses frustration regarding the process for drafting the Sign Ordinance.

This is not a comment on the adequacy of the EIR. No response is required.
Response 11-9:

The commenter states that changing the way the Sign Ordinance is implemented will result in significant impacts due to “rural zoning districts conflicting with new urban designations.”

The comment does not provide details as to how this change could result in significant effects. No response is possible.

Response 11-10:

The commenter states the project will be punitive to the existing rural communities.

This is not a comment on the adequacy of the EIR. No response is required.

Response 11-11:

The comment states that the Sign Ordinance would be inconsistent with General Plan Policy 2.6.1.5, Goal 2.7, and Objective 2.7.1.

The comment does not provide details as to how the project is inconsistent with this policy, goal, or objective. No response is required.
Comments on Draft EIR for proposed EDC Sign Ordinance

1 message

danderly@comcast.net <danderly@comcast.net> Tue, Feb 17, 2015 at 4:25 PM
To: "Dyana Anderly" <danderly@comcast.net>, "Eric Driever" <driever.eric@yahoo.com>, "Mark Harris" <mark54@comcast.net>, "Jane Layton" <janelayton@directcon.net>, anne.novotny@edcgov.us, shawna.purvines@edcgov.us

PLEASE SEE ATTACHED

From: danderly@comcast.net
To: "Dyana Anderly" <danderly@comcast.net>, "Eric Driever" <driever.eric@yahoo.com>, "Mark Harris" <mark54@comcast.net>, "Jane Layton" <janelayton@directcon.net>
Sent: Tuesday, January 27, 2015 1:51:03 AM
Subject: County Sign Ordinance Update - NOA for Draft EIR released 12/31/2014

Hi All,

I've highlighted in yellow (below) the url that will take you to the most recent version of the County Sign Ordinance and the EIR.

From: "Anne Novotny" <anne.novotny@edcgov.us>
To: "driever.eric" <driever.eric@yahoo.com>, "Dyana Anderly" <danderly@comcast.net>
Cc: "Shawna Purvines" <>
Sent: Wednesday, December 31, 2014 2:07:16 PM
Subject: Re: County Sign Ordinance Update - NOA for Draft EIR released 12/31/2014

Eric & Dyana,

On December 31, 2014, a Notice of Availability (NOA) of a Draft Environmental Impact Report (EIR) for the Sign Ordinance Update was released for a 45-day public review and comment period. The deadline to submit written comments is 5:00 p.m. on Tuesday, February 17, 2015. The NOA, Draft EIR and proposed Sign Ordinance Update are posted on the Long Range Planning website:


If you would like a hard copy of the DEIR, please let me know and who/what address to mail it to.

Please forward this email to the other members of the Cameron Park Design Review Committee and anyone else who may be interested.

If you have any questions, please contact me.

Anne Novotny
On Fri, Oct 3, 2014 at 10:32 AM, Anne Novotny <anne.novotny@edcgov.us> wrote:

On October 1, 2014, a Notice of Preparation (NOP) was released for the Sign Ordinance Update draft Environmental Impact Report (EIR). A public scoping meeting is scheduled for Thursday, October 23rd at 6:00 PM in the Planning Commission Hearing Room.

The NOP is posted on the Long Range Planning Website, along with the Public Review Draft of the proposed Sign Ordinance Update:


Please forward this email to the other members of the Cameron Park Design Review Committee and anyone else who may be interested.

Thank you for your valuable input on this comprehensive update to the Sign Ordinance. If you have any questions, please contact me.

Regards,

Anne Novotny
Senior Planner

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Thank you.
The Draft Environmental Impact Report (DEIR) finds the following:

**ES.7 SUMMARY OF ENVIRONMENTAL IMPACTS**

**Impact 3.1.3** The proposed project would not substantially degrade the existing visual appearance or quality of a site and its surroundings. Less than significant. None required. Less than significant

**Comment:** I disagree with the finding of the preparer of the DEIR that the proposed sign ordinance would not substantially degrade the existing visual appearance or quality of a site and its surroundings.

Fact: As the proposed sign ordinance is currently written, there would be no further environmental review of 60' high signs that are outside an officially adopted Scenic View Corridor in that they would be established as a ministerial project having only to meet design standards of height, area and setbacks and that the CEQA issue was already handled under the EIR. The DEIR states the opposite is true, that the signs to the extent adoption and implementation of the Sign Ordinance would result in future sign installations and modifications, which could be either ministerial or discretionary actions by the County, each specific project would be evaluated by County staff to determine the appropriate level of review under CEQA.

There are scenic vistas outside the adopted Scenic View Corridor that could be impacted by the proposed sign ordinance. Furthermore, the DEIR refers to a planned work product that involves looking at establishing additional Scenic View Corridors. This should not be a factor in any determination in the DEIR that the existing visual appearance or quality of a site and its surroundings will not be impacted in that (1) this work project has been proposed for decades with no action taken, (2) the areas being considered may not qualify as a Scenic View Corridors per State standards even though they do have scenic vistas, and (3) even if considered, how the Board of Supervisors may vote on the matter is pure speculation. These facts are evident in the current General Plan showing that the voting public required consideration of expanding the Scenic View Corridor over 10 years ago, the lapse of time between when the proposed sign ordinance was required to be completed, and the numerous consultants hired to prepare various studies and whose work has ended up "on the shelf."

**Excerpt from DEIR:**

1 **PROJECT OVERVIEW**

The proposed project consists of the adoption and implementation of an update to the County's existing Sign Ordinance (Chapter 17.16 of the Zoning Ordinance). The Sign Ordinance update is intended to ensure that signs are consistent with the visual and aesthetic goals and policies set by the El Dorado County General Plan and protect the county's visual character and scenic landscapes. The Planning Commission and the Board of Supervisors will also consider amendments to 2004 General Plan Objective 2.7.1 and corresponding Policy 2.7.1.2 pertaining to billboards along designated scenic corridors. (See Section 2.3.3 for proposed amendment...
Letter 12 Continued

Fact: Because the proposed sign ordinance would allow 60’ high signs along Highway 50, even if in small numbers with 1000 feet between them, and because the proposed sign ordinance would allow 20’ high signs along local, two-lane streets, and because the proposed sign ordinance would allow an unlimited number of 12’ high monument signs (one for each business) within a shopping center, I believe that the number and height of these signs could substantially degrade the existing visual appearance or quality of a site and its surroundings. These facts are evident in viewing the existing signs that are overly large and unsightly both along Highway 50 and along local streets.

Fact: There has been no research put by either a consultant or the County staff to show that 60’ high signs are necessary for providing adequate identification of businesses along Highway 50, so they may be inconsistent with the stated purpose of providing adequate identification while being consistent with visual and aesthetic goals. The Land Use Goal is to balance adequate identification and improving the character of the area in which they are located. Visual examples of a 60’ high sign next to a one-story building would show how inconsistent in scale the sign would be with its surroundings.

Excerpt from DEIR: Table ES-1 lists project and cumulative impacts. "The proposed project could result in significant effects related to the allowance for new digital signs in the County; there are no other significant and unavoidable impacts of implementing the proposed project. The proposed project’s contribution to light and glare under cumulative conditions would be cumulatively considerable; the project would not result in any other cumulatively considerable impacts.

Fact: The preparer of the DEIR is required by CEQA to provide a reasonable range of alternatives. However, the only alternative to excessive light is to not allow digital signs at all. There was no mention of allowing them only in the daytime, or reducing the number of digital signs to a finite number, size and distance so as to reduce the light and glare to acceptable levels. There was no analysis presented or cited to show to what extent light a glare would be increased because no reasonable assumption was made that there would be excessive light and glare, e.g., how many digital signs and of what size would have to occur before there would be a significant adverse impact on light and glare. One would have to conclude that every municipality that allows digital signs should be prepared an EIR and made findings of overriding considerations to permit then, which is highly unlikely.

And finally, to infer that there are no significant aesthetic impacts because the proposed sign ordinance is generally better than the existing ordinance is absurd. It may be superior to the existing, but one cannot conclude from that comment that it is acceptable and meets the intent of the General Plan.
Letter 12 Continued

Excerpt: This section in first paragraph of Project Description.

2.

The intent of the standards is to ensure that signage is consistent with its physical surroundings and does not detract from the surrounding visual character or cause safety hazards. Does not "detract." How about complements, and what is there to ensure that the sign is consistent with its physical surroundings when there is no design review?

Fact: The proposed sign ordinance is inconsistent with the following General Plan Policies:

GOAL 2.2: LAND USE DESIGNATIONS
A set of land use designations which provide for the maintenance of the rural and open character of the County and maintenance of a high standard of environmental quality

GOAL 2.4: EXISTING COMMUNITY IDENTITY
Maintain and enhance the character of existing rural and urban communities, emphasizing both the natural setting and built design elements which contribute to the quality of life, economic health, and community pride of County residents.

Excerpt from DEIR:

2.3.3 PROPOSED GENERAL PLAN AMENDMENT
The proposed project is intended to bring the Sign Ordinance into compliance with the General Plan. Therefore, the proposed project would not conflict with the County's adopted General Plan. The Sign Ordinance update is a policy document and would not directly construct new signs or modify existing signs and would not directly result in any changes in land use or development project entitlements or approvals that could conflict with other applicable resource plans or program (e.g., regional air quality plan). There would be no impact, and this issue is not evaluated further. How about indirectly cause impact?

Fact: The Code of Federal Regulations of the United States of America sets standards for signs as does Cal Trans. It is noted that signs intended to get the attention of motorists are generally not high because they are viewed from windshields and do not cause a driver to take his/her eyes from the path of travel, perhaps no higher than 8 feet. When a sign is 20’ high and is closed to the roadway of a two-lane road, a driver’s attention may be averted, as indicated in the pictures below. They are not as effective as they would be if 6 feet high.

The sign below at about 6 feet high is more effective than one would be at 20 feet high:
Letter 12 Continued

The picture below shows how unsightly tall signs can make a community appear. Any additional signs would only exacerbate the situation.

The picture below shows how a 20’ high sign is less effective at identifying a business than a lower sign and shows that the driver would have to take his/her eyes from the road to read the sign. In addition, this sign is not even visible from eastbound Highway 50 traffic, and is therefore must less effective and costly and less attractive than a lower monument sign would be.
Letter 12 Continued

12-12 cont.
Letter 12 Continued

ENVIRONMENTAL ISSUES EVALUATED IN DETAIL IN THIS DRAFT EIR
This Draft EIR evaluates the environmental effects on aesthetics and visual resources. The analysis is provided in Section 3.1, Aesthetics, in this Draft EIR. Based on a review of potential impacts and comments received in response to the Notice of Preparation (NOP) and during public outreach efforts, the County of El Dorado determined that there was no substantial evidence that the proposed project would cause or otherwise result in significant environmental effects in the resource areas identified in "Environmental Issues Not Evaluated Further in This Draft EIR," below.1

Fact: Although the staff may find no substantial evidence of a significant environmental impact other than light and glare from digital signs, "the County of El Dorado" DID NOT make this determination because they have not considered the final DEIR yet.

A sign has a strong impact on the environment. Signs transmit messages beyond the boundaries of the sites on which they are located and, thus, affect both residents and other passersby. Signs are an integral part of its environment and, as such, can detract from or enhance the image and character of the community. The purpose of a good sign ordinance is to:

Insure that high standards of design and readability and the construction of aesthetically pleasing signs are maintained for all signs.

Protect and preserve the visual beauty and ambience of a community through control of the number, size and types of signs.

Promote aesthetic signing and graphic design that enhances the rural or historic quality of a building and its environment, and thus protect the distinct nature of the community; and

To promote signs that are visually effective.

Submitted by,
Dyana Anderly, AICP
Masters: USC, School of Urban Planning and Development
LETTER 12 – DYANA ANDERLY, RESIDENT, CAMERON PARK

Response 12-1:

The commenter disagrees with the conclusion in the Summary chapter (Table ES-1) Impact 3.1.3 (the project would not substantially degrade the existing visual appearance or quality of a site).

The commenter is referred to DEIR Section 3.1, Aesthetics, which provides a discussion of the impact, and notes that the signs would generally be outside visually sensitive areas (i.e., residential and open space zoning districts). Because signs would generally be associated with commercial and industrial uses in developed areas of the county, signs would not be inconsistent with the character of these areas.

Response 12-2:

The commenter states the EIR should consider additional scenic corridors beyond adopted scenic corridors.

Table 3.1-1 includes a list of scenic areas and viewpoints in the county that were considered in the DEIR. Given the programmatic nature of the DEIR analysis, however, the EIR does not provide a project-specific analysis of any particular viewpoint or scenic corridor.

Response 12-3:

The commenter states that disclosing the potential for County action to amend General Plan policies has no place in the DEIR Project Description and that its outcome is speculative.

The commenter is not correct. The project includes a proposal to amend an objective and policy from the General Plan; therefore, the action must be included in the Project Description. The Board of Supervisors has discretion to approve or deny the General Plan Amendment and/or the Sign Ordinance. The DEIR did not, however, state or imply that approval of the General Plan Amendment is assured.

Response 12-4:

The commenter believes that signs along Highway 50 would substantially degrade the visual character along Highway 50.

The commenter's opinion is noted and forwarded to the decision-makers for their consideration.

Response 12-5:

The commenter states there has been no research to demonstrate the need for 60-foot signs along Highway 50, which makes it inconsistent with the land use goals of the General Plan.

An EIR is not intended to justify any component of the project; the purpose of the EIR is to analyze the physical environmental effects of the project as proposed.

Response 12-6:

The commenter states that CEQA requires an EIR to analyze a “reasonable range of alternatives” and that additional alternatives could have been analyzed to reduce effects of
3.0 COMMENTS AND RESPONSES

digital signs. Examples of additional alternatives noted by the commenter include allowing
digital signs only in the daytime and reducing the number of digital signs to a finite number, size,
and distance so as to reduce the light and glare to acceptable levels.

The comment is correct that CEQA requires an EIR to analyze a reasonable range of alternatives
but also states that “[a]n EIR need not consider every conceivable alternative to a project”
(CEQA Guidelines Section 15126.6(a). The No Digital Signs Alternative would result in a greater
reduction of impacts related to light generated by digital signs than the additional alternatives
proposed by the commenter. Therefore, the alternatives suggested by the commenter would
not provide substantial additional information related to reducing potential project impacts.
However, they are forwarded to the decision-makers for their consideration.

Response 12-7:

The commenter states there is no assumption made about how many digital signs and of what
size would have to occur before there would be a significant adverse impact on light and glare.
The commenter also states that one would have to conclude that every municipality that allows
digital signs should prepare an EIR and make findings and overriding considerations, which is
highly unlikely.

The commenter is correct in that the County does not have an established threshold related to
light generated by signs. Consequently, the EIR analysis is conservative and concluded that the
number, type, and location of signs that would be constructed in the future are not known, so
the EIR determines that the impact is potentially significant. As stated in the second paragraph
on page 2.0-1, the proposed project does not apply to municipalities, but only to the
unincorporated portions of the County. The commenter does not indicate why the significant
and unavoidable determination in the EIR is incorrect.

Response 12-8:

The commenter states that to infer there are no significant aesthetic impacts because the
proposed Sign Ordinance is generally better than the existing ordinance is absurd and cannot
conclude that it meets the intent of the General Plan.

The commenter is referred to DEIR Section 3.1, Aesthetics, for a discussion of the project impacts.
The DEIR does not state or infer that the impacts are less than significant because the proposed
Sign Ordinance is better than the existing ordinance. Based on the evaluations contained in the
DEIR, staff and the EIR consultant concluded the proposed project is generally consistent with
the County General Plan. However, the opinions expressed in the EIR are in no way binding on
the Board of Supervisors in the exercise of its discretion.

Response 12-9:

The commenter takes issue with the use of the phrase “does not detract” in the following
sentence from the Project Description: “The intent of the standards is to ensure that signage is
consistent with its physical surroundings and does not detract from the surrounding visual
character or cause safety hazards.” The commenter suggests “complements.”

This is a comment on the project and not on the adequacy of the EIR.
Response 12-10:

The commenter states the project is inconsistent with General Plan Goals 2.2 and 2.4.

The comment does not provide details as to how the project is inconsistent with these goals. No response is required.

Response 12-11:

The comment references text referring to potential land use changes associated with the project and questions whether there would be indirect impacts.

The proposed project would not result in indirect impacts related to land use changes. See also response to Comment 10-5.

Response 12-12:

The comment notes that signs are intended to attract the attention of motorists and higher signs (e.g., 20 feet) are not as effective as a lower sign (e.g., 6 feet). The comment also includes photos of examples.

This is not a comment on the adequacy of the DEIR. No response is required.

Response 12-13:

The commenter refers to text on page 3.0-1 and states the County of El Dorado did not make a determination that there was no substantial evidence that the proposed project would cause or otherwise result in significant environmental effects in the resource areas identified in “Environmental Issues Not Evaluated Further in This Draft EIR.”

The commenter is correct; the decision-makers have not yet made such a determination, but must certify the EIR prior to approval of the Sign Ordinance. The text on page 3.0-1 is corrected as follows:

Based on a review of potential impacts and comments received in response to the Notice of Preparation (NOP) and during public outreach efforts, the County of El Dorado staff and the EIR consultant determined that there was no substantial evidence that the proposed project would cause or otherwise result in significant environmental effects in the resource areas identified in “Environmental Issues Not Evaluated Further in This Draft EIR,” below.

Response 12-14:

The commenter provides comments regarding the purpose of a good sign ordinance.

This is not a comment on the adequacy of the DEIR, but will be forwarded to the decision-makers for their consideration.
REFERENCES


4.0 ERATA
4.1 INTRODUCTION

This section presents minor corrections and revisions made to the Draft EIR initiated by County staff and/or consultants based on their ongoing review. Revisions herein do not result in new significant environmental impacts, do not constitute significant new information, and do not alter the conclusions of the environmental analysis. New text is indicated in underline, and text to be deleted is reflected by a strikethrough unless otherwise noted in the introduction preceding the text change. Text changes are presented in the page order in which they appear in the Draft EIR.

4.2 AMENDMENTS TO THE DRAFT EIR

SECTION 2.0

The text in the second paragraph on DEIR page 2.0-1 is amended as follows:

The proposed update provides for the use of moving signs, such as barber poles or electronic (digital) signs that may use animation, flashing, scrolling, or video screens under certain conditions (e.g. signs shall not change message more than once every 8 seconds), whereas the existing Sign Ordinance specifically prohibits all flashing or moving signs.

A reference to barber poles was included in an early draft of the Sign Ordinance, but “Moving signs” and “barber poles” are not referenced in the proposed Sign Ordinance Update. This language was mistakenly included in the Project Overview in the Draft EIR. The language following “….certain conditions” was added to clarify a specific restriction in the Sign Ordinance Update (Section 17.16.070 [H][3][b]) placed on digital signs that change messages. These changes do not affect the analysis in the Draft EIR.

SECTION 3.0

The second sentence under the heading “Environmental Issues Evaluated in Detail in this EIR” on page 3.0-1 is amended as follows:

Based on a review of potential impacts and comments received in response to the Notice of Preparation (NOP) and during public outreach efforts, the County of El Dorado staff and the EIR consultant determined that there was no substantial evidence that the proposed project would cause or otherwise result in significant environmental effects in the resource areas identified in “Environmental Issues Not Evaluated Further in This Draft EIR,” below.

Section 3.1

Mitigation measure 3.1.4 on page 3.1-11 is amended as follows to clarify the measurement distance for brightness levels of digital signs (the new text is shown in double underline):

3.1.4 The text of Code Section 17.16.070(H)(3)(c) shall be amended as follows:

Digital signs shall not operate at brightness levels of more than 0.3 foot-candles above ambient light, as measured using a foot-candle meter at a distance of 250 feet from the sign face as determined by the following formula: measurement distance = Measurement distance shall equal the square root of the area of the sign multiplied by...
Each digital display area shall have a light-sensing device that will adjust the brightness of the sign as ambient light conditions change throughout the day.