1. 2:00 P.M. Agenda

   Documents:

   2021-02-11 Planning Commission Regular Meeting Agenda.pdf

2. Meeting Materials

   Documents:

   21-1-18 Legal Response.pdf
   21-1-18 Helen Email.pdf
   21-1-21 Mary Coolidge Comments.pdf
   21-1-22 Loren Bloch Email.pdf
   DRAFT-Ord 368-Loren Questions.pdf
   Planning Commission Lighting Packet (Same As Jan 20 CC Packet).Pdf
   PC Memo February 2, 2021.Pdf

CITY OF YACHATS
PLANNING COMMISSION SPECIAL MEETING
Yachats OR
Thursday, February 11, 2021, 2020 at 2:00 pm
Public Meeting via ZOOM Meeting

Join Zoom Meeting
https://us02web.zoom.us/j/87115458319?pwd=NkkyMFYzR0ZoQlFiQWIHNHEvSWpoUT09

Meeting ID: 871 1545 8319
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One tap mobile
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Regular Meeting

I. Call to Order
II. Announcements and Correspondence
III. Citizen's Concerns
IV. Old Business
    A. Review and revise Lighting Ordinance based on the lawyer's input
V. Other Business
    A. From the Commission
    B. From Staff

Commission meets the third Tuesday of each month.

This meeting is open to the public and all interested persons are invited to attend the ZOOM Meetings. This meeting will be audio taped. All items to be considered by the Commission must be submitted to City Hall no later than one week prior to the meeting. The minutes of this meeting is the Audio Tape which will added to the packet after the meeting within 24 hours. In accordance with ORS 192.630, City of Yachats will make a good faith effort to provide accommodations for any person desiring to attend a public meeting, if the request is made at least 48 hours in advance of the meeting time; a sign language or foreign language interpreter may be available, with advance notice. Call City Hall at 541- 547-3565 or Oregon Relay 1- 800-735-2900 (TDD) two days in advance. Posted 01/22/2021

January 18, 2021

Response to Legal Review of the Lighting Ordinance

Three points to consider:

1. The cost of replacement of marine lights is indeterminent since both the type of lighting, and the purpose of the lighting is unclear. In discussion with the representative of the Adobe Resort it was suggested that the five lights referred to by the Planning Commission as Marine Lighting were actually functioning as security lighting. There are several fairly inexpensive security lighting changes which are available. One example is to change the wiring for the lights outside of each first floor room to be linked so that they are all turned on at dusk, and turned off at dawn. The cost of any changes was considered by the Planning Commission, and that was the reason for the 3 year implementation time.
2. The separate compliance time for residential verses commercial uses was recommended by the Planning Commission due to consideration of both cost and customer satisfaction considerations for the commercial use of marine lighting. Although the current marine lighting is not mentioned in advertising for local lodging businesses, it is considered to be a draw for returning customers. If we were to regulate commercial and residencial marine lighting the same, it is not clear whether compliance times and curfews for residencial customers should change to match commercial requirements, or visa versa, or a combination in between.
3. There is nothing special about the curfew being set at 11pm, except that 11pm is the time currently in use by the Overleaf Lodge. There is no suggestion being made that the specific time of 11pm is a requirement of the nearby marine life. The research suggests that a time of light, and a time of dark during each 24 hour period is a requirement for the survival of certain marine creatures. However, it should be noted that restrictions on marine lighting are not simply recommended in order to preserve marine life. The rational includes the following points.
    a) Preserve marine life.
    b) The Marine Lighting is also Trespass Lighting as identified in 9.42.040A, and 9.42.040B.
    c) Lighting on buildings shall not be placed above the eaves 9.42.040G.
    d) Preexisting Nuisance Ordinance section 5.08.165A: Exterior lighting shall not be directed from the property of the owner onto private residencial or commercial property, streets, parklands, or other public properties.

Other comments included:

- Further definition of “bright” is not required for enforcement of Trespass Lighting. However, it is easy to add.
- Definition of “temporary” refers to a holiday season. However, a definition can be added.
- The copyright for pictures used in the ordinance has been released. In fact their reuse is encouraged.
- It is standard practice to refer to enforcement to follow “after the passage of this ordinance” rather than specifying a specific date since the effective date may be delayed by discussions such as the current one.
- It is unclear why the standard variance process could not be used in review of judgements based on the lighting ordinance.

- YMC 9.42.070(2)(c) is not a regulation. It is an attempt by the Planning Commission to insure that issues brought forth by representatives of the local lodging industry are dealt with in detail, and that further discussions not delay implementation of other components of the Lighting Ordinance.
- YMC 9.42.050(E) is not a regulation. It was put in by the Planning Commission due to a comment arising from the last review of the Lighting Ordinance asking what can be done about street lights. It can be removed since, as stated, a resolution is already available.
- Several corrections have been made to section 9.42.050 Standards Based on Use. These changes ignored the intent of this section, and, in fact reversed what was intended. The Planning Commission is aware that what is built in some zones does not match the primary intent of the zoning. For example, in commercial zones other uses are allowed including those identified by R4, R3, R2, and R1 zones. In other words single family residences are allowed, and are, in fact, present, in C1 zones. The Planning Commission intended to draft regulations based on usage, not zoning.

Justin Peterson

From: Helen Anderson <happydogs27@gmail.com>
Sent: Monday, January 18, 2021 8:02 PM
To: Christine Orchard; Holly Hamilton; Jacqueline Danos; Lance Bloch; Loren Dickinson; Office Admin; Justin Peterson
Subject: Lighting Ordinance revisited
Attachments: legal Response.pdf

Hi Commissioners,

We recently learned the Attorney has made comments on the lighting draft we sent to Council. We should discuss this at our meeting tomorrow.

See the Lighting Ordinance attachment to the City Council Agenda for January 20. Here is the link. Brace yourself, it is 85 pages. I have not seen the actual comments from the attorney. I've just seen what Justin has summarized in his introductory memo (page 1 and a little of page 2).
https://www.yachatsoregon.org/AgendaCenter/ViewFile/Item/1384?fileID=3756

Lance drafted some responses to these comments. See the attached document.

I made the following comments to Lance:

A. I had a concern that we distinguished 1 and 2 family homes from larger ones. For the larger ones, we said 3 or more family homes. That was changed to "multifamily" - which to me includes a 2 family home. I think it needs to stay 3 or more.

B. I'm not a fan of making distinctions on marine lighting based on commercial v residential use. I think vacation rentals muck up the distinction even more. I honestly don't see how we justify different treatment there.

C. I've had a few people really not like the 11 pm curfew. Several people have suggested it would be better to set the curfew as a time period after sunset. That makes logical sense to me. Sunset in late June is around 9p. 2 hours after sunset gives people 60-90 minutes of seeing the ocean in the dark. Just a thought.

We can discuss all of this tomorrow. See you then!
Helen

Justin Peterson

From: Mary Coolidge <mcoolidge@audubonportland.org>
Sent: Wednesday, January 20, 2021 9:14 PM
To: Justin Peterson; cityhall@mailyachatsoregon.org
Subject: Questions from City Council Lighting Ordinance discussion today

Hello Justin,
I just listened to the Lighting Ordinance discussion from today's Yachats City Council meeting.

Some questions that you can perhaps help me with:
--Reference was made to a staff memo on the draft lighting ordinance. Is the staff memo public? If so, can you share it?
--Reference was made to several questions and comments that the City Attorney provided. Are those public?
--Reference was made to comments from someone named John Purcell. Can I see those comments as well?
--I'm trying to understand who the current City Councilors and Planning Commissioners are and the City website does not seem to be current. Can you by chance provide me a current list?
--Sounds like there is already a nuisance ordinance in code language (5.08.165A) that addresses light trespass. Can you tell me whether there is any precedent for enforcing it?
--Have the streetlights in Yachats been converted to LED or are they still HPS?

Thank you for your help!
All the best,
Mary

--
Mary Coolidge
BirdSafe and Non-Lead Campaign Coordinator
Portland Audubon
Bird Safe Buildings program
Take the Pledge to go Lights Out!
Watch the Science on Tap Case for Dark Sky Preservation
503.866.3779 cell

Fwd: Lighting Ord

Lance Bloch <lancebloch1@gmail.com>

Fri 1/22/2021 3:58 PM

To: Yachats City Planner <Planner@YachatsMail.org>

1 attachments (1 MB)

DRAFT-Ord 368-Loren questions.pdf;

---------- Forwarded message ---------
From: **Loren Dickinson** <lorendickinson@gmail.com>
Date: Fri, Jan 22, 2021, 2:59 PM
Subject: Lighting Ord
To: Lance Bloch <lancebloch1@gmail.com>

Lance,

Since the Planning Commission will be reviewing the DRAFT Lighting Ord 368, with Justin's and the atty's comments / changes, I'd like to have the atty explain the legal reasoning for the following:

Attached are 3 pages of the DRAFT Ord with my hand-written questions. It appears that the proposed changes may be in conflict with the Planning Commission's intent by changing / eliminating some of the language. I'd like to hear the legal reasons that the language the PC originally came up with cannot be used. See my comments - questions. Affected sections are: 9.42.050.A.2.b. (p.10), 9.42.050.B. (p.10), and 9.42.050.C.1. (p.11)

In addition, but not shown in attachments: I'd like to know the legal reason that "parking spaces" cannot be included in 9.42.070.B.2. (p.13)

--
LOREN DICKINSON
Yachats Planning Commission

9.42.050 page 10

By changing this to multi-family, you would be including two-family, which is not the way the PC intended it. The PC wanted this section to be 3+ units... not 2+. Is there a legal problem with this?

1. Individual light sources on residential properties are limited to an output of eight hundred (800) lumens each. An eight hundred (800) lumen output is approximately equivalent to:

a. One (1) standard incandescent sixty (60) watt bulb

b. One (1) compact fluorescent fifteen (15) watt bulb

c. One (1) LED eight (8) watt bulb

2. Individual Lot Limit. The sum of the output of all outdoor lighting sources shall not exceed:

a. Five thousand six hundred (5,600) lumens on lots greater than zero-point-three (0.3) acres

b. Three thousand two hundred (3,200) lumens on lots less than or equal to zero-point-three (0.3) acres

Without this... would dirt parcels of exactly 0.3 acres would not be included. Must it not be included?

3. Residential light sources shall be less than a color temperature of three thousand (3,000) Kelvin.

4. Lights on free standing poles higher than four (4) feet are prohibited.

B. ~~Three or more Residential Unit~~Multi-Family Uses

1. Individual lamps on multi-family properties are limited to an output of one thousand two hundred (1,200) lumens each, except for parking areas which may be two thousand (2,000) lumens each.

2. Individual Lot Limit. The sum of the output of all light sources shall not exceed two and one-half (2.5) lumens per square foot of hardscape.

3. A Requirement of a to-scale a~~A~~rea of i~~I~~llumination p~~P~~lan. A to-scale Area of Illumination Plan shall include:

   a. To-scale plans that accurately indicate the location, type, intensity, and height of luminaires including both building-mounted and ground-mounted fixtures;

   b. A description of the luminaires, including lamps, poles or other supports and shielding devices, which may be provided as catalogue illustrations from the manufacturer;

   c. Photometric data, such as that furnished by the manufacturer superimposed over a copy of the site plan, showing the angle of light emission and the foot-candles on the ground; and

   d. Additional information as may be required by the city in order to determine compliance with this chapter.

4. Poles for luminaires shall be limited to:

   a. Sixteen (16) feet in height for parking areas.

9.42.050
page 11

b. Ten (10) feet in height for walkways and pedestrian facilities.

C. Commercial Uses

1. Commercial ~~lots, when developed for commercial~~ uses~~,~~ shall not exceed limits on trespass lighting as specified in 9.42.040.B.

2. Except for security lighting for pathways and building doors, outdoor lighting fixtures for commercial properties must be turned off when the business is not open. When businesses are closed, residential lighting requirements apply.

3. Individual Lot Limit. The sum of the output of all light sources shall not exceed two and one-half (2.5) lumens per square foot of hardscape.

4. Requirements of a to-scale Area of Illumination Plan

   a. New developments for commercial uses shall provide an Area of Illumination Plan drawn to scale as part of the Site Plan.

   b. An a~~A~~rea of i~~I~~llumination p~~P~~lan drawn to scale shall be required with a change of commercial use or transfer of property for existing commercial uses.

   c. An a~~A~~rea of i~~I~~llumination p~~P~~lan drawn to scale shall include:

      i. The location, type, intensity, and height of luminaires including both building- and ground-mounted fixtures;

      ii. A description of the luminaires, including lamps, poles or other supports and shielding devices, which may be provided as catalogue illustrations from the manufacturer;

      iii. ~~iii.~~ Photometric data, such as that furnished by the manufacturer, superimposed over a copy of the site plan, showing the angle of light emission and the foot-candles on the ground; and

      iv. ~~iv.~~ Additional information as may be required by the city in order to determine compliance with this chapter.

5. High intensity lights shall be limited to two thousand four hundred (2,400) lumens per luminaire. Due to their high energy efficiency, long life, and spectral characteristics, narrow-spectrum amber LED's are the preferred illumination source.

6. Poles for luminaires shall be limited to:

   a. Sixteen (16) feet in height for parking lots.

   b. Ten (10) feet in height for walkways and pedestrian facilities.

D. Pedestrian Ways and Parks

Is there a legal problem with making requirements based on "use" rather than zoning? By eliminating this language it makes it zoning-based rather than use-based which is not what the PC intended.

1. Illumination: Light shall be directed in such a manner that any changes in elevation of the walkway (e.g., steps or curbs) shall be illuminated such that said features are clearly discernible (without shadow).

2. Fixture Type: Pedestrian walkway light fixtures can be a combination of freestanding pole, bollard, in-place step or building-mounted fixtures. For building mounted fixtures, the Planning Director shall ensure that the proposed fixture type will be in scale with the building elevation on which it is to be installed. The Planning Director may refer this latter determination to the Planning Commission.

3. Fixture Heights: Light fixtures shall not exceed the following height provisions:

   a. Freestanding pole - Not greater than fourteen (14) feet as measured from finished grade to the bottom of the light fixture.

   b. Building-mounted - Shall be located below the roof's eave or up to a height of fourteen (14) feet, whichever is less.

   c. Bollard - Said fixture type shall not exceed a height of forty-two (42) inches as measured from finished grade to the top of the fixture.

~~E. Public Right-of-Ways 1. Shielding for street lights other than those on Highway 101 may be requested from the public utility provider.~~

9.42.060 Variances

To provide for reasonable interpretation of this Chapter, and in certain instances where this Chapter may produce a hardship, a property owner may apply for a variance pursuant to Chapter 9.80 of this Code

9.42.070 Time to Become Compliant

A. The General Standards described in 9.42.030 and 9.42.040 require compliance within one year after the passage of this Ordinance. Notwithstanding the City's non-conforming use provisions in YMC Chapter 9.76.

   1. When violations of 9.42.040 are ~~cited~~ issued a notice by the enforcement officer and if the violation can be corrected by replacing an existing bulb with a lower intensity bulb, this corrective action is required to be implemented within fourteen (14) days after the ~~citation~~ notice is issued. Other corrective actions are required to be implemented within sixty (60) days after the ~~citation~~ notice is issued.

   2. Marine lighting existing prior to the enactment of this ordinance must be:

      a. Turned off between 11:00 PM and sunrise each night, and

      b. Removed, replaced, or disconnected within three years of the enactment of this ordinance.

      ~~c. It is recommended that the City Council and the Planning Commission enter into negotiations with interested representatives~~

Comment: I do not believe this language is actually intended to be included in the Ord.

January 15, 2020

To: **Shannon Beaucaire, City Manager**

From: **Justin Peterson, Contract City Planner**

Re: **Draft Amendments Lighting**

Upon further review the Lighting Ordinance and consultation with the City Attorney Staff believes there are areas where the record can be improved to support the proposed language and policy choices. The goal is to strengthen the record so Planning Commission and City Council can make a decision based on the facts in the record.

Here some questions that City Council and Planning Commission may consider:

- How much do marine lights cost? The amount of time you give a business or property owner to replace equipment should have some relationship to the expense of the equipment. The more expensive the equipment the more time the City would want to allow for compliance.
- Planning Commission was interested in a separate compliance timeline for residential vs commercial uses. What is the difference between a residential marine light vs. a commercial marine light? If they are the same fixture then there is not much reason to treat them differently.
- As to the curfew, is there evidence in the record as to why light after 11PM is harmful, as compared to light before 11PM? During the winter, that would allow the lights to be on for at least five hours; during the summer, only a couple hours. The record should have information about why 11PM is important for this type of lighting and the harm it causes.

Other comments included:

- A need to clarify the meaning of "bright" in the Marine lighting definition.
- A need to better define temporary.
- A question about official copyright permission for the images.
- Instead of stating "after the passage of this ordinance" defining a specific date.
- A need for an administrative process to review rather than the standard variance process. It is unclear how a lighting regulation could meet the variance requirements.
- YMC 9.42.070(2)(c) is not a regulation. As such, it does not belong in the Code.
- YMC 9.42.050(E) should be removed since it is not a regulation.

Last comments from the City Attorney included minor text edits, formatting edits, and updating terms formatting to match existing formatting in YMC 9.04. The attached Ordinance has track changes identifying suggested text edits.

Public Hearing History: At the October 20, 2020 Planning Commission meeting the decision was made to continue the hearing to October 28, 2020. At the October 28, 2020 continued Planning Commission meeting, the Commission passed a motion to forward the attached recommended amendment to Yachats Municipal Code to City Council. The Planning Commission identified several changes that are noted in the memo dated November 10, 2020 to the lighting ordinance. The City Council remanded the draft Ordinance back to the Planning Commission at the November 18, 2020 meeting. Planning Commission discussed the Ordinance at the December 1, 2020 Planning Commission meeting. Planning Commission voted to recommend approval and forward the Ordinance to City Council at the December 21, 2020 meeting.

Issue/Question: Does the Municipal Code address lighting within the City of Yachats in a manner which supports the goals of the Comprehensive Plan?

Explanation: The Municipal Code currently addresses lighting minimally and without specificity; restricting exterior lighting directed to adjacent property (broadly defined by use).

> **See Section 5.08.165 Exterior lighting.**
> A. Exterior lighting shall not be directed from the property of the owner onto private residential or commercial property, streets, parklands, or other public properties.

The City of Yachats Comprehensive Plan GOAL D Conservation of Energy and GOAL G Control of Urban Growth and Form to sustain the small - town, ocean - side character of the Yachats Community supports the addition of a comprehensive lighting strategy which requires energy efficient lighting standards and addresses the adverse effects of bright, outdoor lighting, light trespass and glare.

The Planning Commission member amendments since the November 18, 2020 meeting are highlighted in the draft Ordinance. In addition, Planning Commission recommends that the images from earlier versions of the Ordinance be added back into the draft Ordinance.

Staff received additional written comments from Michael Lebofsky on December 29, 2020 and Bill Kowalik on December 30, 2020 which are included with the other Public comments.

Council Action:

1. The City Council may approve,
2. Approve with modifications,
3. Deny or
4. Remand back to the Planning Commission for reconsideration the proposed amendment

Example Motion:

To approve the proposed amendment to the Yachats Municipal Code based on the testimony received, the findings within the staff report, and the evidence and arguments before the City Council at the public hearings. The City Council determines that the request by the City of Yachats to add Section §9.42.050 and amend Section §9.04.030, of the Yachats Municipal Code. The City Council hereby adopts the staff memo as findings and the other evidence in the record as findings supporting its decision and approves the Ordinance.

Attachments:

1. Draft Ordinance with Track Changes
2. Draft Ordinance before Track Changes.
3. Public Comments
4. Planning Commission Members Comments and Research
5. Staff memos from earlier public meetings (October 20, 2020 and November 10, 2020 memo)

CITY OF YACHATS
ORDINANCE NO. 368

AN ORDINANCE AMENDING THE YACHATS MUNICIPAL CODE CHAPTERS 9.04 – DEFINITIONS AND 9.42 LIGHTING.

WHEREAS, pursuant to ORS 197.610, the City provided DLCD with Form 1 notice of these proposed YMC Title 9, Chapter 9.54, text changes on September 13, 2020;

WHEREAS, notice of the proposed amendments were provided in accordance with procedures established in the Yachats Municipal Ceode and Oregon Revised Statues;

WHEREAS, the Planning Commission held a ~~work session~~ multiple work sessions in 2020, to provide an open forum for discussion of the amendments;

WHEREAS, the Planning Commission and City Council held a work session, to provide an open forum for discussion of the amendments;

WHEREAS, the Planning Commission held a public hearing on October 20, 2020 for the proposed amendments;

WHEREAS, the Planning Commission public hearing was continued to October 28, 2020 for the proposed amendments;

WHEREAS, the Planning Commission followed the text amendment procedures under YMC 9.84.020 and has provided a report to the City Council along with its recommendation to consider the proposed text changes;

WHEREAS, the City Council held a public hearing on these proposed text changes on November 18, 2020 and remanded the Ordinance back to the Planning Commission;

WHEREAS, the Planning Commission held a public hearing on December 21, 2020 for the proposed amendments;

WHEREAS, the City Council held a public hearing on January 20, 2021 for the proposed amendments;

NOW THEREFORE, the City of Yachats ordains as follows:

Section 1. ~~Yachats Municipal Code Chapter 9.04 and Definitions~~The following definitions are to be added to YMC 9.04.030, in alphabetical order.

CHAPTER 9.04.030 – Definitions

A. "Cutoff Angle (of a luminaire)" means: The angle, measured from the lowest point between a vertical line from the center of the lamp extended to the ground and the first line of sight at which the bare source is not visible.

B. "Exterior Lighting" means: lLighting relating to the outside of a building or structure.

C. "Fixture" (also called a luminaire or light fixture) means: aA complete lighting unit including the light source (bulb), mounting, and shielding.

D. "Floodlight": means aA light that produces up to one thousand eight hundred (1,800) lumens and is designed to "flood" a well-defined area with light.

E. "Foot-candle": means aA measure of luminance or a measure of how bright a light appears to the eye. One foot-candle is equal to one lumen per square foot. As an example, a 60-watt incandescent light (800 lumens) produces an illuminance of one-tenth (0.1) foot candle at a distance of about twenty-five (25) feet.

F. "Glare" means a: lLight that causes a visual impairment sensation due to excessive brightness from the light source and can interfere with one's ability to see. See Figures 2 and 3 in 9.42.020.

G. "Hardscape" means: pPermanent hard landscape improvements to the site including parking lots, drives, entrances, curbs, ramps, stairs, steps, medians, walkways and non-vegetated landscaping that is ten (10) feet or less in width. Materials may include concrete, asphalt, stone, gravel, etc.

H. "High Intensity Lighting": means lLamps which produce visible light directly by the electrical heating or excitation of a gas. Examples of such lighting include, but are not limited to, metal halide, high-pressure sodium, low-pressure sodium and mercury vapor.

I. "Individual Lamp Limit" means: lLimit on output of any individual light source as enumerated in Section 9.42.040.C

J. "Individual Lot Limit" means: tThe maximum for the sum of all exterior individual light sources on a given property as enumerated in 9.42.050.A and 9.42.050.C.

K. "Light Trespass/Trespass Lighting": means aAny light emitted from an outdoor luminaire that either shines directly beyond the property on which the luminaire is installed or indirectly shines beyond the property on which the luminaire is installed at a brightness that exceeds one-tenth (0.1) foot candle at twenty five (25) feet from the light source or at the property line, whichever is more restrictive. See Figure 4 in 9.42.020.

L. "Lighting Source Height": means tThe distance from finished grade to the top most portion of any light emitting source (e.g., lamp, surface or lens).

M. "Luminaire": See definition for "fixture".

N. "Marine Lighting": means bBright light fixtures directed at the ocean and coastal tide pools, and illuminating the marine area.

O. "Outdoor Lighting Fixture": means aA luminaire outside of an enclosed building or structure, or any luminaire directed such that it primarily illuminates outdoor areas.

P. "Security Lighting" means: mMinimal lighting for personal and building security and safety after hours.

Q. "Shielding": means aAn opaque covering for an Outdoor Lighting Fixture such that no light rays are emitted above the horizontal plane running through the lowest point of the fixture. Shielding can be extended downward to prevent "Light Trespass" as defined above. See examples in Section 9.42.080.D.

R. "Uplighting": means lLighting that is directed in such a manner as to shine light rays above the horizontal plane.

S. "Temporary Seasonal Lighting" means: eExterior lighting that is specifically directed at a holiday season such as Christmas, Halloween, and others. This will consist of small, low wattage bulbs of less than 10 lumens each.

Section 2. ~~Yachats Municipal Code Chapter 9.42 Lighting~~A new Chapter 9.42 is added to the YMC to provide as follows:

9.42.010 Purpose

The purpose of this Ordinance is to provide regulations for outdoor lighting that will accomplish the following goals:

A. Permit the use of outdoor lighting that promotes health, safety, security, and productivity.

B. Protect shoreline natural resources and wildlife.

C. Enhance the view of the dark sky.

D. Minimize the adverse effects of bright, outdoor lighting including "light trespass" and "glare".

9.42.020 Definitions

Types of light are defined in part by their intended use and impact. Full definitions are in 9.04.030. Figure 1 provides basic distinctions between types of light.

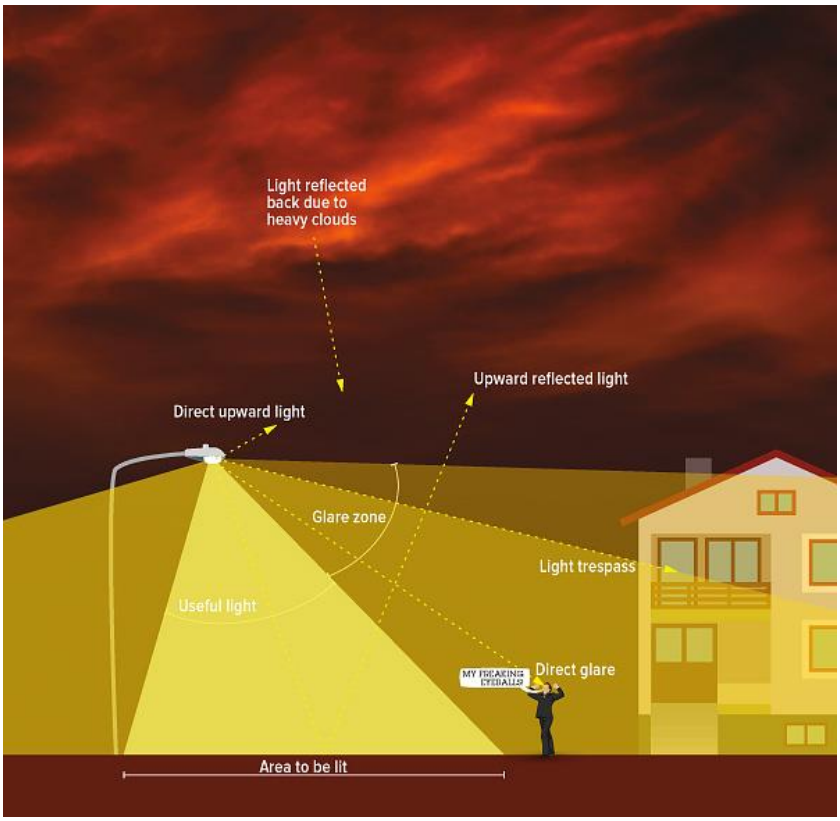


Figure 1. Types of Light

Image by Anezka Gocova, in "The Night Issue", Alternatives Journal 39:5 (2013)

Figure 2: Example of glare from a light pole

Photo: James Lowenthal, Smith College

Figure 3. Example of glare from car headlights

Figure 4. Light Trespass

9.42.030 General Lighting Requirements

A. Conformance with all applicable codes. All outdoor lighting shall be installed in conformance with the provisions of this ~~ordinance~~Chapter, applicable e~~E~~lectrical and e~~E~~nergy codes, and applicable sections of the ~~City, County and State~~ building codes.

B. Applicability. Except as described below, all outdoor lighting installed after the date of this ~~ordinance~~ Chapter shall comply with the requirements specified in section 9.42. This includes, but is not limited to, new lighting, replacement lighting, or any other lighting whether attached to structures, poles, the earth, or any other location, including lighting installed by any third party.

C. Exemptions. The following are not regulated by this ~~Ordinance~~Chapter:

1. Lighting within the public right-of-way or easement for the principle purpose of illuminating streets ~~or roads~~.
2. Lighting for public monuments and statuary.
3. Lighting solely for signs (Covered in Chapter 9.44).
4. Repairs to existing luminaires not exceeding twenty-five percent (25%) of the total replacement value of the luminaire.
5. Temporary lighting for theatrical, musical, and other performance areas and construction sites.
6. Underwater lighting in swimming pools.
7. Temporary, seasonal lighting provided that individual lights are less than ten (10) lumens.
8. Lighting that is only used under emergency conditions.
9. Lighting identified and approved in a specific use permit.
10. Lighting required by County, State, or Federal government.

9.42.040 General Standards

A. Outdoor lighting fixtures and accent lighting must be shielded and aimed downward, and ~~it~~ must be installed at the minimum height necessary so that the cutoff angle does not allow direct lighting of an adjacent property at a level exceeding one-tenth (0.1) foot-candles at twenty-five (25) feet from the light source. See examples in Section 9.42.080.

B. All trespass lighting/light trespass that exceeds one-tenth (0.1) foot-candles at twenty-five (25) feet from the light source or at the property line is prohibited.

C. Motion activated security lights must not be triggered by motion on adjacent properties or streets. These lights must be shielded so that they do not shine onto adjacent properties in excess of one-tenth (0.1) foot-candles at the property line.

D. All new Marine lighting is prohibited.

E. Mercury vapor lamps, metal halide lamps, and low-pressure sodium lamps are prohibited.

F. Uplighting of building and landscaping is prohibited.

G. Lighting on buildings shall not be placed above the eaves.

9.42.050 Standards Based on Use

A. Single-~~-~~Family or ~~2~~ Two-Family Residential Uses

1. Individual light sources on residential properties are limited to an output of eight hundred (800) lumens each. An eight hundred (800) lumen output is approximately equivalent to:

a. One (1) standard incandescent sixty (60) watt bulb

b. One (1) compact fluorescent fifteen (15) watt bulb

c. One (1) LED eight (8) watt bulb

2. Individual Lot Limit. The sum of the output of all outdoor lighting sources shall not exceed:

a. Five thousand six hundred (5,600) lumens on lots greater than zero-point-three (0.3) acres

b. Three thousand two hundred (3,200) lumens on lots less than or equal to zero-point-three (0.3) acres

3. Residential light sources shall be less than a color temperature of three thousand (3,000) Kelvin.

4. Lights on free standing poles higher than four (4) feet are prohibited.

B. ~~Three or more Residential Unit~~Multi-Family Uses

1. Individual lamps on multi-family properties are limited to an output of one thousand two hundred (1,200) lumens each, except for parking areas which may be two thousand (2,000) lumens each.

2. Individual Lot Limit. The sum of the output of all light sources shall not exceed two and one-half (2.5) lumens per square foot of hardscape.

3. A Requirement of a to-scale a~~A~~rea of i~~I~~llumination p~~P~~lan. A to-scale Area of Illumination Plan shall include:

a. To-scale plans that accurately indicate the location, type, intensity, and height of luminaires including both building-mounted and ground-mounted fixtures;

b. A description of the luminaires, including lamps, poles or other supports and shielding devices, which may be provided as catalogue illustrations from the manufacturer;

c. Photometric data, such as that furnished by the manufacturer superimposed over a copy of the site plan, showing the angle of light emission and the foot-candles on the ground; and

d. Additional information as may be required by the city in order to determine compliance with this chapter.

4. Poles for luminaires shall be limited to:

a. Sixteen (16) feet in height for parking areas.

b. Ten (10) feet in height for walkways and pedestrian facilities.

C. Commercial Uses

1. Commercial ~~lots, when developed for commercial~~ uses~~,~~ shall not exceed limits on trespass lighting as specified in 9.42.040.B.

2. Except for security lighting for pathways and building doors, outdoor lighting fixtures for commercial properties must be turned off when the business is not open. When businesses are closed, residential lighting requirements apply.

3. Individual Lot Limit. The sum of the output of all light sources shall not exceed two and one-half (2.5) lumens per square foot of hardscape.

4. Requirements of a to-scale Area of Illumination Plan

   a. New developments for commercial uses shall provide an Area of Illumination Plan drawn to scale as part of the Site Plan.

   b. An a~~A~~rea of i~~I~~llumination p~~P~~lan drawn to scale shall be required with a change of commercial use or transfer of property for existing commercial uses.

   c. An a~~A~~rea of i~~I~~llumination p~~P~~lan drawn to scale shall include:

      i. The location, type, intensity, and height of luminaires including both building- and ground-mounted fixtures;

      ii. A description of the luminaires, including lamps, poles or other supports and shielding devices, which may be provided as catalogue illustrations from the manufacturer;

      iii. ~~iii.~~ Photometric data, such as that furnished by the manufacturer, superimposed over a copy of the site plan, showing the angle of light emission and the foot-candles on the ground; and

      iv. ~~iv.~~ Additional information as may be required by the city in order to determine compliance with this chapter.

5. High intensity lights shall be limited to two thousand four hundred (2,400) lumens per luminaire. Due to their high energy efficiency, long life, and spectral characteristics, narrow-spectrum amber LED’s are the preferred illumination source.

6. Poles for luminaires shall be limited to:

   a. Sixteen (16) feet in height for parking lots.

   b. Ten (10) feet in height for walkways and pedestrian facilities.

D. Pedestrian Ways and Parks

1. Illumination: Light shall be directed in such a manner that any changes in elevation of the walkway (e.g., steps or curbs) shall be illuminated such that said features are clearly discernible (without shadow).

2. Fixture Type: Pedestrian walkway light fixtures can be a combination of freestanding pole, bollard, in-place step or building-mounted fixtures. For building mounted fixtures, the Planning Director shall ensure that the proposed fixture type will be in scale with the building elevation on which it is to be installed. The Planning Director may refer this latter determination to the Planning Commission.

3. Fixture Heights: Light fixtures shall not exceed the following height provisions:

    a. Freestanding pole - Not greater than fourteen (14) feet as measured from finished grade to the bottom of the light fixture.

    b. Building-mounted - Shall be located below the roof's eave or up to a height of fourteen (14) feet, whichever is less.

    c. Bollard - Said fixture type shall not exceed a height of forty-two (42) inches as measured from finished grade to the top of the fixture.

~~E. Public Right-of-Ways 1. Shielding for street lights other than those on Highway 101 may be requested from the public utility provider.~~

9.42.060 Variances

To provide for reasonable interpretation of this Chapter, and in certain instances where this Chapter may produce a hardship, a property owner may apply for a variance pursuant to Chapter 9.80 of this Code

9.42.070 Time to Become Compliant

A. The General Standards described in 9.42.030 and 9.42.040 require compliance within one year after the passage of this Ordinance. Notwithstanding the City's non-conforming use provisions in YMC Chapter 9.76.

    1. When violations of 9.42.040 are ~~cited~~ issued a notice by the enforcement officer and if the violation can be corrected by replacing an existing bulb with a lower intensity bulb, this corrective action is required to be implemented within fourteen (14) days after the ~~citation~~ notice is issued. Other corrective actions are required to be implemented within sixty (60) days after the ~~citation~~ notice is issued.

    2. Marine lighting existing prior to the enactment of this ordinance must be:

        a. Turned off between 11:00 PM and sunrise each night, and

        b. Removed, replaced, or disconnected within three years of the enactment of this ordinance.

        ~~c. It is recommended that the City Council and the Planning Commission enter into negotiations with interested representatives~~

~~of the local lodging businesses to evaluate replacement and relocation alternatives to better comply with sections 9.42.040 and 9.42.050 above. These negotiations must be completed prior to the three year limitation identified above, otherwise item b. above is invoked.~~

B. Compliance based on extent of modification:

1. New uses and buildings. For all proposed new land uses, developments, buildings, and structures that require a permit, all outdoor lighting installations shall meet the requirements of this Code.

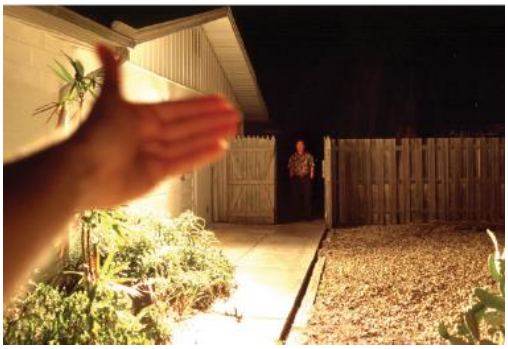
2. Additions and modifications. All building additions or modifications exceeding twenty-five (25) percent in terms of additional dwelling units or~~,~~ gross floor area~~, or parking spaces~~, and that require a permit, either with a single addition or cumulative additions, shall ~~invoke~~ comply with the the requirements of this ~~Code~~Chapter. This requirement shall hold for the entire property, including both previously installed and any new outdoor lighting.

3. If replacement or repair is required to an outdoor lighting fixture due to weather damage, accident, vandalism, or other unforeseen event, the outdoor lighting fixture may be replaced as it was previously built. Compliance to ~~section~~ Chapter 9.42 requirements is not required. However, if the design is changed in any way then compliance is required.

C. Resumption of use following abandonment. If a property or use with non-conforming lighting is abandoned, all outdoor lighting shall be reviewed and brought into compliance with this ~~Code~~ Chapter before the use is resumed.

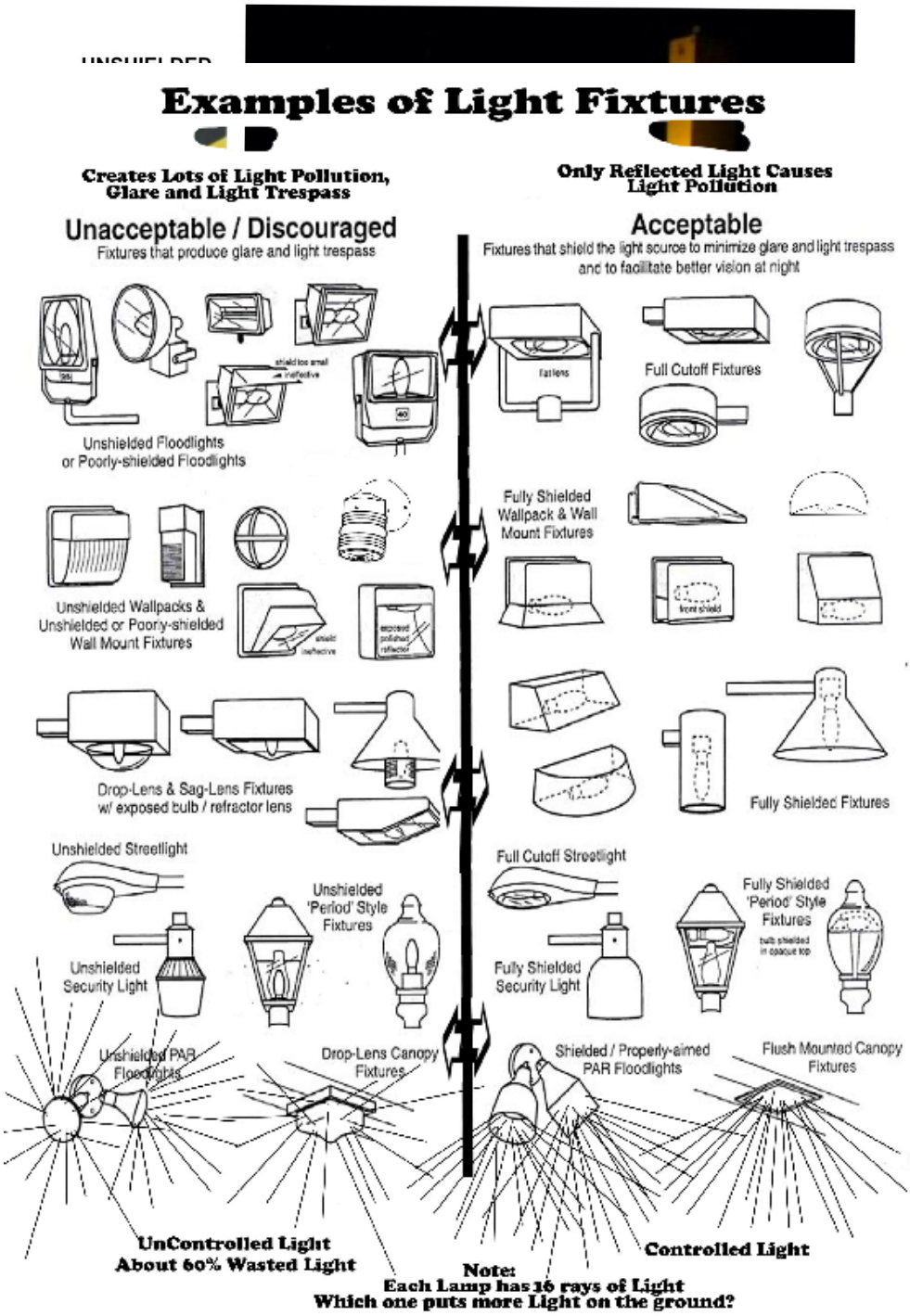
9.42.080 Examples

A. Example showing that bright lights are not always better for security. Glare from bright wall light masks person standing at gate.



B. Example of before and after with addition of shielding on a street light. Shielded light better illuminates roadway and sidewalks. (Images from International Dark-Sky Association Intro to Lighting public materials.)

C. Example of shielding reducing glare on property and providing for better illumination of area.



D. Examples of properly shield light fixtures. (Images from International Dark-Sky Association Intro to Lighting Public materials.)

Section 3. Severability. Any provision of this Ordinance which proves to be invalid, void, or illegal shall in no way affect, impair or invalidate any other provision of this Ordinance, and the remaining provisions of this Ordinance shall remain in full force and effect.

Section 4. Effective Date. This ordinance shall take effect on the 30th day after its adoption.

Passed and adopted by the Yachats City Council this _____ day of _____, 20___

	YES	NO	NOT PRESENT
Leslie Vaaler, Mayor	☐	☐	☐
Greg Scott	☐	☐	☐
Mary Ellen O'Shaughnessey	☐	☐	☐
Ann Stott	☐	☐	☐
Vacant	☐	☐	☐

_____
Leslie Vaaler, Mayor

Attest by:

_____
Shannon Beaucaire, City Manager

CITY OF YACHATS
ORDINANCE NO. 368

AN ORDINANCE AMENDING THE YACHATS MUNICIPAL CODE CHAPTERS 9.04 – DEFINITIONS AND 9.42 LIGHTING.

WHEREAS, pursuant to ORS 197.610, the City provided DLCD with Form 1 notice of these proposed YMC Title 9, Chapter 9.54, text changes on September 13, 2020;

WHEREAS, notice of the proposed amendments were provided in accordance with procedures established in the Yachats Municipal code and Oregon Revised Statues;

WHEREAS, the Planning Commission held a work session multiple work sessions in 2020, to provide an open forum for discussion of the amendments;

WHEREAS, the Planning Commission and City Council held a work session, to provide an open forum for discussion of the amendments;

WHEREAS, the Planning Commission held a public hearing on October 20, 2020 for the proposed amendments;

WHEREAS, the Planning Commission public hearing was continued to October 28, 2020 for the proposed amendments;

WHEREAS, the Planning Commission followed the text amendment procedures under YMC 9.84.020 and has provided a report to the City Council along with its recommendation to consider the proposed text changes;

WHEREAS, the City Council held a public hearing on these proposed text changes on November 18, 2020 and remanded the Ordinance back to the Planning Commission;

WHEREAS, the Planning Commission held a public hearing on December 21, 2020 for the proposed amendments;

WHEREAS, the City Council held a public hearing on January 20, 2021 for the proposed amendments;

NOW THEREFORE, the City of Yachats ordains as follows:

Section 1. Yachats Municipal Code Chapter 9.04 and Definitions

CHAPTER 9.04.030 – Definitions

A. Cutoff Angle (of a luminaire): The angle, measured from the lowest point between a vertical line from the center of the lamp extended to the ground and the first line of sight at which the bare source is not visible.

B. Exterior Lighting: Lighting relating to the outside of a building or structure.

C. Fixture (also called a luminaire or light fixture): A complete lighting unit including the light source (bulb), mounting, and shielding.

D. Floodlight: A light that produces up to one thousand eight hundred (1,800) lumens and is designed to "flood" a well-defined area with light.

E. Foot-candle: A measure of luminance or a measure of how bright a light appears to the eye. One foot-candle is equal to one lumen per square foot. As an example, a 60-watt incandescent light (800 lumens) produces an illuminance of one-tenth (0.1) foot candle at a distance of about twenty-five (25) feet.

F. Glare: Light that causes a visual impairment sensation due to excessive brightness from the light source and can interfere with one's ability to see. See Figures 2 and 3 in 9.42.020.

G. Hardscape: Permanent hard landscape improvements to the site including parking lots, drives, entrances, curbs, ramps, stairs, steps, medians, walkways and non-vegetated landscaping that is ten (10) feet or less in width. Materials may include concrete, asphalt, stone, gravel, etc.

H. High Intensity Lighting: Lamps which produce visible light directly by the electrical heating or excitation of a gas. Examples of such lighting include, but are not limited to, metal halide, high-pressure sodium, low-pressure sodium and mercury vapor.

I. Individual Lamp Limit: Limit on output of any individual light source as enumerated in Section 9.42.040.C

J. Individual Lot Limit: The maximum for the sum of all exterior individual light sources on a given property as enumerated in 9.42.050.A and 9.42.050.C.

K. Light Trespass/Trespass Lighting: Any light emitted from an outdoor luminaire that either shines directly beyond the property on which the luminaire is installed or indirectly shines beyond the property on which the luminaire is installed at a brightness that exceeds one-tenth (0.1) foot candle at twenty five (25) feet from the light source or at the property line, whichever is more restrictive. See Figure 4 in 9.42.020.

L. Lighting Source Height: The distance from finished grade to the top most portion of any light emitting source (e.g., lamp, surface or lens).

M. Luminaire: See definition for "fixture".

N. Marine Lighting: Bright light fixtures directed at the ocean and coastal tide pools, and illuminating the marine area.

O. Outdoor Lighting Fixture: A luminaire outside of an enclosed building or structure, or any luminaire directed such that it primarily illuminates outdoor areas.

P. Security Lighting: Minimal lighting for personal and building security and safety after hours.

Q. Shielding: An opaque covering for an Outdoor Lighting Fixture such that no light rays are emitted above the horizontal plane running through the lowest point of the fixture. Shielding can be extended downward to prevent "Light Trespass" as defined above. See examples in Section 9.42.080.D.

R. Uplighting: Lighting that is directed in such a manner as to shine light rays above the horizontal plane.

S. Temporary Seasonal Lighting: Exterior lighting that is specifically directed at a holiday season such as Christmas, Halloween, and others. This will consist of small, low wattage bulbs of less than 10 lumens each.

Section 2. Yachats Municipal Code Chapter 9.42 Lighting

9.42.010 Purpose

The purpose of this Ordinance is to provide regulations for outdoor lighting that will accomplish the following goals:

A. Permit the use of outdoor lighting that promotes health, safety, security, and productivity.

B. Protect shoreline natural resources and wildlife.

C. Enhance the view of the dark sky.

D. Minimize the adverse effects of bright, outdoor lighting including "light trespass" and "glare".

9.42.020 Definitions

Types of light are defined in part by their intended use and impact. Full definitions are in 9.04.030. Figure 1 provides basic distinctions between types of light.

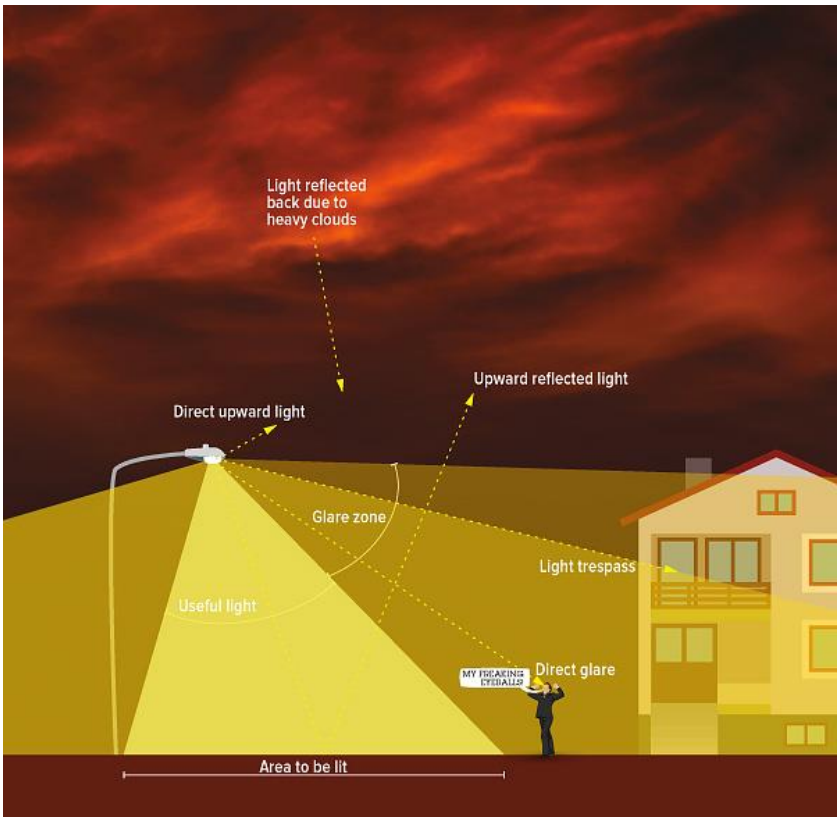


Figure 1. Types of Light

Image by Anezka Gocova, in "The Night Issue", Alternatives Journal 39:5 (2013)

Figure 2: Example of glare from a light pole

Photo: James Lowenthal, Smith College

Figure 3. Example of glare from car headlights

Figure 4. Light Trespass

9.42.030 General Lighting Requirements

A. Conformance with all applicable codes. All outdoor lighting shall be installed in conformance with the provisions of this ordinance, applicable Electrical and Energy codes, and applicable sections of the City, County and State building codes.

B. Applicability. Except as described below, all outdoor lighting installed after the date of this ordinance shall comply with the requirements specified in section 9.42. This includes, but is not limited to, new lighting, replacement lighting, or any other lighting whether attached to structures, poles, the earth, or any other location, including lighting installed by any third party.

C. Exemptions. The following are not regulated by this Ordinance:

1. Lighting within the public right-of-way or easement for the principle purpose of illuminating streets or roads.
2. Lighting for public monuments and statuary.
3. Lighting solely for signs (Covered in Chapter 9.44).
4. Repairs to existing luminaires not exceeding twenty-five percent (25%) of the total replacement value of the luminaire.
5. Temporary lighting for theatrical, musical, and other performance areas and construction sites.
6. Underwater lighting in swimming pools.
7. Temporary, seasonal lighting provided that individual lights are less than ten (10) lumens.
8. Lighting that is only used under emergency conditions.
9. Lighting identified and approved in a specific use permit.
10. Lighting required by County, State, or Federal government.

9.42.040 General Standards

A. Outdoor lighting fixtures and accent lighting must be shielded and aimed downward, and it must be installed at the minimum height necessary so that the cutoff angle does not allow direct lighting of an adjacent property at a level exceeding one-tenth (0.1) foot-candles at twenty-five (25) feet from the light source. See examples in Section 9.42.080.

B. All trespass lighting/light trespass that exceeds one-tenth (0.1) foot-candles at twenty-five (25) feet from the light source or at the property line is prohibited.

C. Motion activated security lights must not be triggered by motion on adjacent properties or streets. These lights must be shielded so that they do not shine onto adjacent properties in excess of one-tenth (0.1) foot-candles at the property line.

D. All new Marine lighting is prohibited.

E. Mercury vapor lamps, metal halide lamps, and low-pressure sodium lamps are prohibited.

F. Uplighting of building and landscaping is prohibited.

G. Lighting on buildings shall not be placed above the eaves.

9.42.050 Standards Based on Use

A. Single Family or 2 Family Residential Uses

1. Individual light sources on residential properties are limited to an output of eight hundred (800) lumens each. An eight hundred (800) lumen output is approximately equivalent to:

a. One (1) standard incandescent sixty (60) watt bulb

b. One (1) compact fluorescent fifteen (15) watt bulb

c. One (1) LED eight (8) watt bulb

2. Individual Lot Limit. The sum of the output of all outdoor lighting sources shall not exceed:

a. Five thousand six hundred (5,600) lumens on lots greater than zero-point-three (0.3) acres

b. Three thousand two hundred (3,200) lumens on lots less than or equal to zero-point-three (0.3) acres

3. Residential light sources shall be less than a color temperature of three thousand (3,000) Kelvin.

4. Lights on free standing poles higher than four (4) feet are prohibited.

B. Three or more Residential Unit Uses

1. Individual lamps on multi-family properties are limited to an output of one thousand two hundred (1,200) lumens each, except for parking areas which may be two thousand (2,000) lumens each.

2. Individual Lot Limit. The sum of the output of all light sources shall not exceed two and one-half (2.5) lumens per square foot of hardscape.

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a. To-scale plans that accurately indicate the location, type, intensity, and height of luminaires including both building-mounted and ground-mounted fixtures;

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c. Photometric data, such as that furnished by the manufacturer superimposed over a copy of the site plan, showing the angle of light emission and the foot-candles on the ground; and

d. Additional information as may be required by the city in order to determine compliance with this chapter.

4. Poles for luminaires shall be limited to:

a. Sixteen (16) feet in height for parking areas.

b. Ten (10) feet in height for walkways and pedestrian facilities.

C. Commercial Uses

1. Commercial lots, when developed for commercial uses, shall not exceed limits on trespass lighting as specified in 9.42.040.B.

2. Except for security lighting for pathways and building doors, outdoor lighting fixtures for commercial properties must be turned off when the business is not open. When businesses are closed, residential lighting requirements apply.

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      iii. iii. Photometric data, such as that furnished by the manufacturer, superimposed over a copy of the site plan, showing the angle of light emission and the foot-candles on the ground; and

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D. Pedestrian Ways and Parks

1. Illumination: Light shall be directed in such a manner that any changes in elevation of the walkway (e.g., steps or curbs) shall be illuminated such that said features are clearly discernible (without shadow).

2. Fixture Type: Pedestrian walkway light fixtures can be a combination of freestanding pole, bollard, in-place step or building-mounted fixtures. For building mounted fixtures, the Planning Director shall ensure that the proposed fixture type will be in scale with the building elevation on which it is to be installed. The Planning Director may refer this latter determination to the Planning Commission.

3. Fixture Heights: Light fixtures shall not exceed the following height provisions:

    a. Freestanding pole - Not greater than fourteen (14) feet as measured from finished grade to the bottom of the light fixture.

    b. Building-mounted - Shall be located below the roof's eave or up to a height of fourteen (14) feet, whichever is less.

    c. Bollard - Said fixture type shall not exceed a height of forty-two (42) inches as measured from finished grade to the top of the fixture.

E. Public Right-of-Ways 1. Shielding for street lights other than those on Highway 101 may be requested from the public utility provider.

9.42.060 Variances

To provide for reasonable interpretation of this Chapter, and in certain instances where this Chapter may produce a hardship, a property owner may apply for a variance pursuant to Chapter 9.80 of this Code

9.42.070 Time to Become Compliant

A. The General Standards described in 9.42.030 and 9.42.040 require compliance within one year after the passage of this Ordinance.

    1. When violations of 9.42.040 are cited by the enforcement officer and if the violation can be corrected by replacing an existing bulb with a lower intensity bulb, this corrective action is required to be implemented within fourteen (14) days after the citation is issued. Other corrective actions are required to be implemented within sixty (60) days after the citation is issued.

    2. Marine lighting existing prior to the enactment of this ordinance must be:

        a. Turned off between 11:00 PM and sunrise each night, and

        b. Removed, replaced, or disconnected within three years of the enactment of this ordinance.

        c. It is recommended that the City Council and the Planning Commission enter into negotiations with interested representatives of the local lodging businesses to evaluate replacement and relocation alternatives to better comply with sections 9.42.040 and 9.42.050 above. These negotiations must be completed prior to the

three year limitation identified above, otherwise item b. above is invoked.

B. Compliance based on extent of modification:

1. New uses and buildings. For all proposed new land uses, developments, buildings, and structures that require a permit, all outdoor lighting installations shall meet the requirements of this Code.

2. Additions and modifications. All building additions or modifications exceeding twenty-five (25) percent in terms of additional dwelling units, gross floor area, or parking spaces, and that require a permit, either with a single addition or cumulative additions, shall invoke the requirements of this Code. This requirement shall hold for the entire property, including both previously installed and any new outdoor lighting.

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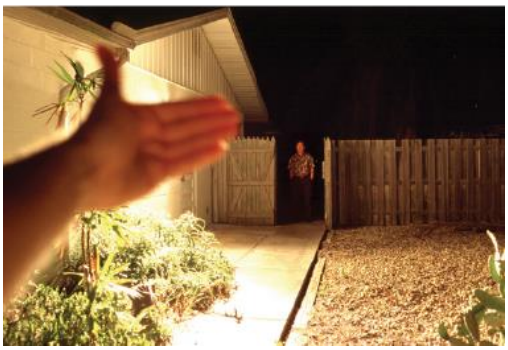
C. Resumption of use following abandonment. If a property or use with non-conforming lighting is abandoned, all outdoor lighting shall be reviewed and brought into compliance with this Code before the use is resumed.

9.42.080 Examples

A. Example showing that bright lights are not always better for security. Glare from bright wall light masks person standing at gate.



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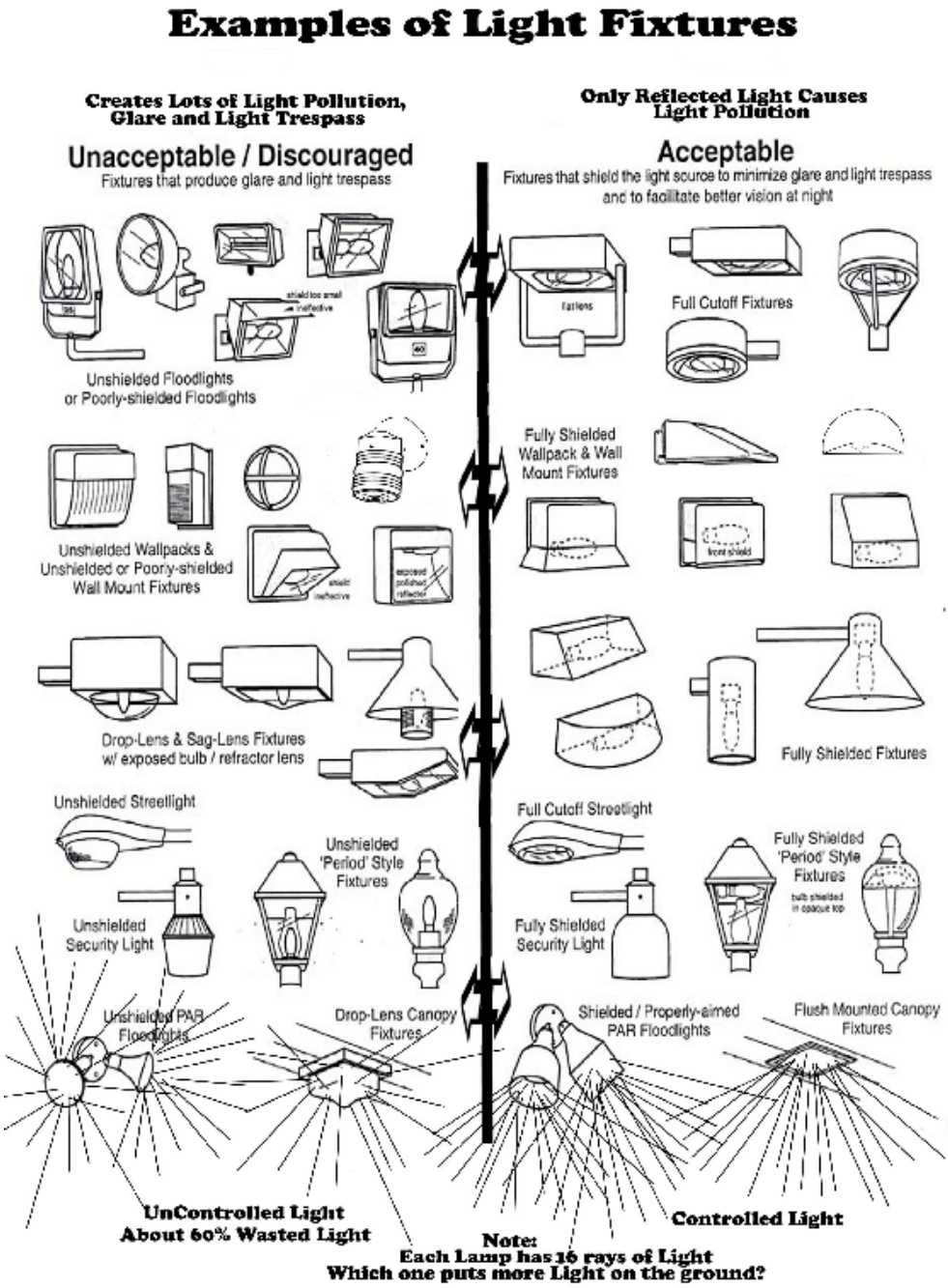
C. Example of shielding reducing glare on property and providing for better illumination of area.

D. Examples of properly shield light fixtures. (Images from International Dark-Sky Association Intro to Lighting Public materials.)



Section 3. Severability. Any provision of this Ordinance which proves to be invalid, void, or illegal shall in no way affect, impair or invalidate any other provision of this Ordinance, and the remaining provisions of this Ordinance shall remain in full force and effect.

Section 4. Effective Date. This ordinance shall take effect on the 30th day after its adoption.

Passed and adopted by the Yachats City Council this _____ day of _____, 20___

	YES	NO	NOT PRESENT
Leslie Vaaler, Mayor	☐	☐	☐
Greg Scott	☐	☐	☐
Mary Ellen O'Shaughnessey	☐	☐	☐
Ann Stott	☐	☐	☐
Vacant	☐	☐	☐

_____
Leslie Vaaler, Mayor

Attest by:

_____
Shannon Beaucaire, City Manager

Attachment 2

RE: For Holly G. Hamilton

lynb953@gmail.com <lynb953@gmail.com>
Tue 10/6/2020 5:49 PM
To: Yachats City Planner <Planner@YachatsMail.org>

But I don't know what those amendments contain. How can I find more info before the Zoom meeting?

M. Brown

Sent from Mail for Windows 10

From: Yachats City Planner
Sent: Tuesday, October 6, 2020 6:45 PM
To: lynb953@gmail.com
Subject: Re: For Holly G. Hamilton

Good afternoon, you are correct, the hearing is about both amendments.

We thought it a best use of city funds to combine the two amendments for notice and public hearings.

Please let me know if I can provide you with additional information on the amendments - you can also find information on the city's Web Site:

https://yachatsoregon.org/

Regards, Holly

Keep Lincoln County Open

Holly G Hamilton, *MJRP*

Assoc. AICP

Contract Planner *for*

Oregon Cascades West Council of Governments

EMAIL:

Planner@Waldport.org

Planner@Yachatsmail.org

hhamilton@OCWCOG.org

OFFICE PHONE:

Voicemail Msg: 541-812-2002

Waldport: 541-563-3561 x 15

Yachats: 541-547-3565

HOURS FOR WALK-IN:

9:00 AM to 4:00 PM (Currently by appt.)

Mon/Thurs – Waldport

Tues/Weds – Yachats

Fri - Remote

Yachats, OR | Official Website

Find events & meetings UPCOMING EVENTS Choose a tab to see Community Events, Classes in the Commons, City meeting schedules, or Public Works Department scheduled activities

yachatsoregon.org

From: lynb953@gmail.com <lynb953@gmail.com>
Sent: Tuesday, October 6, 2020 12:46 PM
To: Yachats City Planner <Planner@YachatsMail.org>
Subject: For Holly G. Hamilton

Ms. Hamilton

I own property within the city limits of Yachats, and am confused about a mailing I received recently from your department titled: NOTICE OF THE CITY OF YACHATS PROPOSED PUBLIC LAND USE HEARING. Is the hearing about Hazard Mitigation and Lighting Ordinance, the two titles in bold type? Or is it another matter? Can you please clear up my confusion on this?

Thank you.

Marilyn M. Brown

Outdoor lighting

Jean Erdahl <jean.erdahl@gmail.com>

Fri 10/9/2020 10:34 AM

To: Yachats City Planner <Planner@YachatsMail.org>

Hello. I am writing in support of the outdoor lighting ordinance to protect the environment and the beauty and our appreciation of the natural night sky. My husband and I moved to Yachats a year ago from a major downtown city after vacationing here often for 20 years. The only time we were able to see the stars at night due to the invasive lighting of the downtown was on our trips to Yachats or the occasional drive out to the countryside. We would be in awe of the features of the night sky that some people seem to take for granted such as the big dipper, the milky way and shooting stars. We are in favor of a lighting ordinance that would help eliminate invasive lighting and protect our natural environment. Ever hopeful, JeanE Erdahl

Lighting ordinance proposal

northnolan1@gmail.com <northnolan1@gmail.com>

Fri 10/9/2020 6:11 AM

To: Yachats City Planner <Planner@YachatsMail.org>

Dear Yachats City Planners,

I would like to express my wholehearted support for the new focus on lighting at residential and commercial properties in the city. My house is at the corner of Marine Drive and Ocean View, and we have been impacted negatively by neighbors lighting to the west on Marine Drive that is unshielded and overwhelmingly in trespass on our home and views. The overhead street light, which was recently changed to a new type of high intensity bulb and fixture, is far in excess of what is needed at that corner, and should be shielded to downlight at lower intensity for the benefit of all. Lastly, the south facing spotlights at the Adobe have been a constant plague on our views of the shore and the night sky. These two lamps may well be directly affecting marine life in the near shore, including the now extinct but once robust smelt spawn, as well as whale and fish activity in the area. Please, please address this serious quality of life issue and move toward the Dark Sky goal that enables all of us to live and sleep in peace with the natural surroundings we love here in Yachats.

Respectfully,
Michael and Kay Nolan
1219 Ocean View Drive
Yachats

Sent from my iPad

Dark sky Yachats

kent naffziger <knbuddah@gmail.com>

Sat 10/10/2020 12:55 PM

To: Yachats City Planner <Planner@YachatsMail.org>

We want to pass along our whole hearted endorsement of the lightning ordinance being considered for Yachats. As near full timers we are so thankful for the ability to observe the Milky Way in the middle of town, but only when our neighbors exterior lights are not in play. We agree that this wonderful sky can be a potential draw for visitors much as the northern lights are in other parts of the world. Our hope is that the ordinance also takes the newly minted led streetlights into account as well. The led are not healthy and are overly bright. We are so thankful that motion "security " lights and other overly bright outside lights will be directed to shine straight down as no resident nor visitors should need to sleep inside a tent atop their bed, inside their home. Thank you for taking these steps and may dark skies reign! Kent Naffziger

Sent from my iPhone

Date: October 13, 2020

To: Yachats Planning Commission

From: Kerry Kemp
420 W. 1st St. (the "Property")
Yachats, OR 97498

RE: Proposed Lighting Ordinance – Comments submitted for Public Hearing 10/20/2020

Thank you for providing the opportunity to submit comments on the draft lighting ordinance ("Ordinance"). I appreciate the City's due diligence, and improper or excessive use of lighting is sometimes an issue. However, it may be government overreaching its police powers on use of property, and although I am not a lawyer it could open the city up to lawsuits if injuries or crimes occur as a result of a lack of adequate lighting. This Ordinance also creates an undue burden on the city, adding costs for administration and enforcement, as well as fostering neighborhood squabbles over compliance.

Even so, if the City decides to go forward with the Ordinance, please consider my input below.

Multi-Family and Residential Uses (definitions):

These definitions should be defined or reference specific definitions elsewhere in the Zoning Code.

Flagpoles

There is an existing 17-foot flagpole installed at the Property, which is currently unlit. There appears to be no provision for allowing lighting of the US flag in this Ordinance. Rather, it seems to disallow it.

Number/Type and Brightness of Lights

The approximately 5,000 square foot Property is Residential Use, which, according to the draft ordinance (Section 9.42.050), may have no more than 800 lumens per fixture, and 3,200 max lumens. This equates to four fixtures. There are currently six lights, which means to comply each one could provide up to 533 lumens, on average, or two fixtures would need to be removed. The question is which two? There are four doors to the house, each of which has a light for security, and they also illuminate patios and walkways for safety. The detached garage also has two lights, one illuminating the deck and the other the door. In addition, the fixtures themselves may not fit the new standards for fixture type. I am concerned that, even though none of the lights shine directly on any neighboring occupied properties—mostly it's right-of-way or state park—the Property will be forced into compliance. This, even though there is a much greater "light trespass" from the frequent vehicles that enter or exit the park. Vehicle lights are a much greater problem than lighting on the Property, which is not often used.

We have spent years improving the Property, including the lighting. All this Ordinance does is create a means to complain, to force spending more effort and money, without much public need or benefit.

Variances

The Ordinance seems to be "one size fits all" with the only flexibility via applying for a variance based on "hardship" (whatever that means), which will cost fees and may or may not even be approved. The Property has been developed since the 1950's, with the garage dating from the 1980's. There should be some mechanism for grandfathering or for allowing non-conforming uses.

Thank you for your consideration.

Lighting by Dublin motel

Susan Macdonell <susanmacdonell1@gmail.com>

Wed 10/14/2020 3:47 AM

To: Yachats City Planner <Planner@YachatsMail.org>

My house is 820 Driftwood Lane. I have to have blackout curtains just to block the all night lighting from the Dublin motel.
The Dublin Motel has 4 very bright lights on the west side of the building on each night
They light up the whole neighborhood .At least 10 houses are impacted by this light pollution.
Yachats has some beautiful starry skies and we should reduce outdoor lighting so as to enjoy it.
I would ask the Dublin to shade their lights .

Lighting Ordinance - comments - questions

Larry Ellington <ellington.larry@gmail.com>

Sun 10/18/2020 8:56 PM

To: Yachats City Planner <Planner@YachatsMail.org>
Cc: 'Caroline van Wagtendonk' <caroline.vanwagtendonk@gmail.com>

Holly G Hamilton, Contract Planner:

We strongly support the proposed lighting ordinance and appreciate the extensive effort of the Planning Commission. We offer the following suggestion and questions.

1. We suggest the lighting ordinance include a reference in section ***9.42.040 General Standards*** to the existing prohibition on exterior lighting directed onto the marine zone (public property) at ***Section 5.08.165*** of the Yachats Municipal code.

   Section 5.08.165 Exterior lighting.
   A. Exterior lighting shall not be directed from the property of the owner onto private residential or commercial property, streets, parklands, or other public properties.

2. Please clarify: ***9.42.070 Time to Become Compliant***
   - ***A. The General Standards described in 9.42.030 and 9.42.040 require compliance within one year after the passage of this Ordinance.***
     - My neighbor's porch light is very bright. Can they defer compliance until the cost to replace/repair their fixture exceeds 25% of total replacement value? Or is bulb replacement considered "replacement lighting"?
     - When must an existing metal halide lamp be removed? Within one year, or when the cost to replace/repair the fixture exceeds 25% of total replacement value?

Thank you,

Larry Ellington
Caroline van Wagtendonk
841 Ocean View Dr.
Ellington.larry@gmail.com

John Purcell
116 Spring Hill Road
P.O.Box 161
Yachats, OR. 97498

October 20, 2020

To: Planning Commission, City of Yachats

Re: Public Comments, Proposed City of Yachats Lighting Ordinance

Dear Planning Commission,

First and foremost, thank you for addressing the lighting ordinance. Your time has been well spent and the draft, well crafted.

As a brief introduction, I was involved in electrical engineering, lighting design, and commercial electrical construction for twenty one years of my career. During that time I was able to gain an understanding of the often complicated and complex world of lighting. With that in mind, I would like to offer my limited experience to try and answer any questions that the Commission might have regarding exterior lighting.

With specific regard to the Draft, I'd like to offer the following comments:

9.04.030 Definitions

Item D: Even though we're all somewhat used to the term, the use of "watts" or "wattage" can be misleading especially with the advent of LED. To help I suggest that the last sentence of this section be reworded as follows:

"As an example, an 800 lumen lamp (equivalent to an old style 60 watt incandescent lamp) produces an illuminance of one-tenth (0.1) foot candle ('lumen') at a distance of about twenty-five (25) feet."

Item I: I suggest that you add the word "exterior" to better define the section.

9.42.50 Standards Based on Use

A. Residential Uses

Item 1: I recommend that you strike "b" & "c" - improvements to both fluorescent and LED lights continue to be able to provide more lumens per watt. The way its written, a homeowner could install more efficient 8 watt LED lamps claiming

conformance while in fact, the new LED lighting may be shedding more than 800 lumens.

B. Multi-family Uses

1. The Draft allows lamps up to two thousand four hundred lumens each. That's three times the allowable limit for a single family residence. That's a lot of light and I don't see a benefit.

3. Add or clarify that the owner/developer "shall provide" a to-scale Area of Illumination Plan.

4. Subsections "a" and "b" are both in conflict ("Twenty (16), and Fourteen (10)"

C. Commercial Uses

General Comment). As I understand it, Yachats allows residential home(s) to be built on commercially zoned properties and when that happens, at least one "commercial benefit" gets extended to the "residential" restrictions: the residence is allowed to exceed the percentage of property coverage (currently 40%) imposed on residential lots and instead use the coverages allowed for a commercial development. The way the Draft is written (Section 4.b and others), a single family dwelling built on a commercial lot could be allowed to use higher lumen fixtures and incorporate more lumens per property.

5. The Draft "encourages" the use of LPS (Low Pressure Sodium) lamps due to their reputation for benefiting dark sky's. While this was true years ago, the advent of LED lamps has made LPS lamps somewhat obsolete. More to the point, Emergency Service Providers disliked LPS because of the lamp's extremely limited color rendition - at an accident scene under LPS lamps, EMS, Police and Fire Crews could not differentiate between blood, water or gasoline. I recommend that the Draft cut the second and third sentences while retaining the first and the fourth.

6. Subsections "a" and "b" are both in conflict ("Twenty (16), and Fourteen (10)

Thank you for taking the time to review my comments. Again: good job.

John Purcell

The ADOBE RESORT

P.O. Box 219
Yachats, Oregon 97498
Telephone (541) 547-3141 • 1-800-522-3623

November 16, 2020

John Moore, Mayor
Yachats City Council Members
City of Yachats
P.O. Box 345
Yachats, Oregon 97498

RE: Proposed Amendments to the City Lighting Code – Title 9.42

Dear Mayor Moore and Yachats City Council Members,

I am writing in an effort to inform the city of our concerns with safety at our property, specifically regarding the proposed removal of marine lighting. The Adobe Resort currently has lights that illuminate the rocky coastline directly in front of The Adobe. The Adobe has been allowed to illuminate this area for the last forty plus years and is an added attraction for our guests to be able to watch the waves from our Restaurant/Lounge, their room and our webcam. Removal of this lighting would hurt our business.

I listened to the commission's discussion during its work session of October 27, 2020. In that discussion, a member of the commission asserted that "most people" in Yachats do not want "marine lighting", but did not cite any surveys, petition or other indicators of public sentiment. I would appreciate more information about the sources and scope of those opinions.

I also was struck by the lack of any distinction during the commission's discussion between "marine lighting" (also referred to by one member as "lighting up the ocean") and "surf lighting". "Surf lighting," like that provided at the Adobe Resort, is much less intrusive on marine life and does not affect breeding areas or the life cycles of local species. I respectfully request that the council and commission give this distinction more study and discussion before adopting a blanket ban of our lighting practices under the heading of "marine lighting" using a code template that was developed for other, different circumstances.

Our lights provide more than just a view at night. The Adobe Resort welcomes around fifty thousand hotel guests a year. The first priority is to keep our guests safe and to avoid circumstances, which could turn into life and death situations for people on our property. These dangers can range from slips and falls to predators confronting guests. Other hotels have dealt with such dangers and applying steps to prevent these things from happening is our main priority. At the Adobe Resort we care about our guests and staff and take these issues seriously.

P.O. Box 219
Yachats, Oregon 97498
Telephone (541) 547-3141 • 1-800-522-3623

Without adequate lighting outside our business, more problems will arise. For example, the ocean's cliff is jagged and dangerous to those walking. If people are not able to see the cliff, it is possible they could be seriously hurt by slipping and falling. The rocks on the ocean's edge are uneven and unsafe, especially when you cannot see them clearly. Taking away our lights would be taking away a precaution we have set in place to protect our guests. Contrary to the statements of one planning commission member, "ambient lighting" would be insufficient to provide this protection.

The check-in time for the Adobe is at 4pm and with the sun setting so early in the winter time, our natural light is gone quicker than usual. Nature is something we cannot change, but we can help compensate for the loss of natural light. The Adobe does not have a defined trail in front of our property, but we have allowed guests and people from town to walk across our bluff. People enjoy watching the waves, the gorgeous sunsets, and make use of our benches. Lights help show the coastline and guide people back to where they need to go. An increased worry for our guests and others making use of our property occurs if we do not have lights in place to help guide them. As you know, coastal winds are very strong. The lights we currently have in place are stable and perform the job required, unlike other types of lighting.

The safety of our guests in their rooms presents another problem. The resort has 26 ground floor guest rooms that open toward the ocean. These rooms would lose all security lighting if this proposal is implemented. Along with our lights we have a webcam, cameras and security that roam the area throughout the night. The truth is, lights and added security are never a 100% guarantee of safety and being crime free. Yet, we do those precautions to try and protect ourselves. Our goal as a business is to protect our guests the best we can.

I also noted the planning commission's discussion of the increased safety concerns for multi-family housing parking areas. That illustrates the need for the commission to also consider the safety concerns for our parking lot. In addition, our parking lot is not in a residential neighborhood.

While working in my six years so far as general manager at The Adobe, I can confirm that we have had crime occur. Such as stolen goods and belongings out of cars or ground floor rooms. These are realities as a business that we are faced with and have to prevent on a daily basis the best way possible. With less lighting in these areas, those problems would only increase.

If this amendment is passed and our lighting is removed, the bluff area will have to become an area reserved only for hotel guests. Guests would be required to sign a waiver when checking-in, stating that they recognize climbing on the rocks and being out in the dark is not recommended for their safety. I will also be recommending a fence and gate with guest key access only. In order to protect our guests, non-guests would no longer have access to our property. Many currently walk across our property to access the 804 Trail. Sadly, this new amendment would force us to take these actions. Access to the 804 Trail from Smelt Sands via Highway 101 will remain.

The ADOBE RESORT

P.O. Box 219
Yachats, Oregon 97498
Telephone (541) 547-3141 • 1-800-522-3623

For the past forty+ years The Adobe Resort has been able to illuminate its coastline and parking lot to provide the extra safety and security to our guests and staff. I highly recommend that the city think about the points I have made and ask for support in our goal to keep our lighting status quo. Thank you for reading and listening to our concerns about this new city lighting code.

Sincerely,

Anthony Muirhead
Adobe Resort
General Manager

Received 11/28/2020

Dear Planning Commission,

Thank you for your hard work on the new lighting ordinance. The proposed ordinance establishes standards for the respectful use of external lights in our community.

It is ironic that those who have been violating our health and safety ordinance (Yachats Municipal Code 5.08.165) for the past 15 years claim to be doing so for safety. And the Yachats City Council, whose obligation it is to enforce that code, is now facilitating "a compromise." Color me skeptical.

I don't know if the council has been presented with the results of the Planning Commission's public survey, but the people who responded, overwhelmingly oppose the "marine lights." The commission knows this because it specifically asked them that question.

Perhaps another survey might be in order, but the City Council and the hospitality industry should understand that the sampling done by the Planning Commission is unambiguous – the sampled community opposes these lights by a pretty wide margin.

Compromise isn't actually a land use policy, and the community isn't obligated to do so. Land use Goal C, Policy #2 obligates the city to mitigate adverse effects upon water quality and fish and wildlife habitat resulting from the use of shore lands.

There is clear evidence that these lights attract insects, which dramatically skews their natural distribution. Species of bats that tolerate light will gorge themselves on the clouds of congregated insects, while those that are "light-shy" will go hungry. How does compromise mitigate this adverse effect?

The giant orange domes of glare that reach high into the night sky above the 804 Trail are the single biggest source of light pollution in Yachats. These giant, high-intensity, focused beam lights are obviously for the aesthetic enjoyment of shoreline views from inside the buildings, and are not intended for exterior security or safety purposes. Sitting in the restaurant, or in your room, enjoying the illuminated surf is the entire point. The Yelp reviews, that even bother to mention the lights at all, enjoyed them from inside the building.

However, upon stepping outside of the building, these bright lights ruin ones night vision and actually make walking the 804 Trail dangerous. For the same reason that shining a bright light directly into your eyes doesn't help you see better in the dark, these high intensity lights create a very high contrast condition of blinding glare, surrounded by inky darkness. Additionally, illuminating the rocky bluff at night, serves as a implicit invitation to explore the buffs at night. Clearly a bad idea.

The assumption that visitors would prefer an artificially illuminated, Disneyesque experience, rather than the unspoiled darkness, and unobstructed view of the deep shy is highly questionable, and even a little old fashioned, in my opinion. In today's highly light-polluted world, dark skies are marketable, and some of the best viewing occurs during the winter months when thermal eddies are minimal.

Just imagine, the Milky Way Galaxy illuminating our dark southern sky. Imagine the bluff, busy with people setting up tripods for telescopes, deep-sky binoculars and cameras. Imagine renown

astro-photographers (not to mention our really fine local photographers) coming to Yachats to photograph the Andromeda Galaxy, or the Great Orion Nebula, both of which, are visible through binoculars on a moonless night.

Imagine kids being able to see, for the first time, the moons of Jupiter, and the rings of Saturn. Imagine the benefit of dark skies, coupled with our unimpeded views of the western horizon, when the next comet makes its trip to our sunset. Yes, it rains a lot, but we get stretches of clear winter skies in January and February that are absolutely perfect for deep sky enthusiasts.

Perhaps rather than using threats and coercion to force a compromise, the hospitality industry, and the City Council, should consider respecting the opinion of the community and our land-use policies. Let's turn the lights off, and find ways to capture the economic benefits that a dark sky has to offer.

Douglas Conner
Yachats

Proposed Yachats Lighting Ordinance

ellington.larry@gmail.com <ellington.larry@gmail.com>

Sun 12/13/2020 1:36 PM

To: Yachats City Planner <Planner@YachatsMail.org>; lancebloch1@gmail.com <lancebloch1@gmail.com>; Planning Commission Chair - Helen Anderson <Happydogs27@gmail.com>

December 13, 2020

To: Planning Commission

From: Larry Ellington & Caroline van Wagtendonk
841 Ocean View Dr.

RE: Proposed Lighting Ordinance

We remain hopefully optimistic that marine lighting will be prohibited by the new lighting ordinance.

On Ocean View Dr, between Marine Drive and 7th St. we count seven marine lights (plus wiring for one on a house under construction) – three are located on the shoreline bank, and four are mounted on houses above the eaves.

Curfew

Recent discussions about delaying the removal of existing marine lights for an extended period of time (i.e. over a year) reinforces the need for a marine light curfew during the interim period. The current draft includes curfew language, but given our experience with lights along Ocean View Dr., we find that lights are sometimes turned off at night and then turned back on in the wee hours of the morning. While the current language may address this, it would be better to make it clear for code enforcement. (We found this proposed language in state and county regulations in Hawaii.)

A suggested change, if existing marine lighting is proposed to continue for a period of time after ordinance adoption:

> " 2. Marine lighting existing previous to the enactment of this ordinance must be:
>
> *a.* Turned off *between 10:00 PM and sunrise,* and
>
> b. Removed within one year of the enactment of this ordinance."

Adobe and Overleaf

We reviewed the Adobe's and the Overleaf's website and Facebook comments and see no marketing focus related to their marine lighting (aka security lighting). They neither mention the lights nor have pictures of the lights on their websites.

We found regulation language (again in Hawaii) that related to condo-hotels on the shoreline that addressed specific security/safety concerns of this type of use. For this shoreline use, shielded security lighting can be installed along the shoreline, provided the light extends no more than 30 feet beyond the shoreline/bank. This type of lighting might meet the needs of a specific commercial use and advance the community's interest in light control.

Thanks for your time,

Larry and Caroline

Re: New home purchase on Ocean View Drive (existing lights pointed at surf in back yard)

Michael Lebofsky <michaellebofsky@yahoo.com>

Tue 12/29/2020 9:20 AM

To: Yachats City Planner <Planner@YachatsMail.org>
Cc: Lisa Lebofsky <lisamlebofsky@gmail.com>

Public comment on **marine lighting**:
I believe a reasonable personal property approach would include a curfew (perhaps 11pm) and a duration limit (perhaps 3 hours).
I believe a reasonable business property approach would include a curfew (perhaps 11pm).

Mike Lebofsky
Property Owner on Ocean View Drive

On Monday, December 28, 2020, 02:14:35 PM MST, Yachats City Planner <planner@yachatsmail.org> wrote:

Michael,

I am available tomorrow. Feel free to call 541-924-8420.

The proposed updates will be discussed at the City Council Meeting on January 20th, 2021.

Thank you,
Justin Peterson

Contract Planner *for*
Oregon Cascades West Council of Governments

***EMAIL**:*
Planner@Yachatsmail.org

OFFICE PHONE:
Yachats: 541-547-3565

From: Michael Lebofsky <michaellebofsky@yahoo.com>
Sent: Friday, December 25, 2020 8:23 AM
To: Yachats City Planner <Planner@YachatsMail.org>

INTERNATIONAL DARK-SKY ASSOCIATION
OREGON CHAPTER

TO PRESERVE THE MAGNIFICENT DARK SKIES OF OREGON AND DIMINISH LIGHT POLLUTION FOR THE HEALTH, SAFETY AND WELL-BEING OF ALL LIFE

December 30, 2020

W. John Moore, Mayor of Yachats

Dear Mayor Moore:

We applaud the recent efforts by the City of Yachats to address and minimize intrusive and overly-bright exterior lighting at night. In support of your efforts, we wish to bring to your attention a large and growing body of research on the deleterious impacts of light pollution on both diurnal and nocturnal birds, fish, amphibians, mammals and plants, as well as on human health. A number of peer-reviewed research papers (abbreviated list in Appendix below) demonstrate the adverse impacts of artificial light at night on marine and intertidal ecosystems as well as the ocean seafloor.

The Oregon Chapter of the International Dark-Sky Association was formed two years ago. We are excited to be part of an international community working to protect one of our planet's most valuable and most threatened natural resources—our night skies. Our goal is to encourage the use of thoughtful, well-designed lighting that simultaneously prioritizes safety and vibrance on the ground, while minimizing energy-wasting light pollution across Oregon.

As we transition into 2021, we are increasing our outreach and communication efforts. We are expanding our network of dark sky quality measurements, supporting the nomination of International Dark Sky Places throughout our state, building enthusiasm about Oregon's astro-tourism industry, and working with more public, private and government organizations on dark sky preservation initiatives.

Please feel free to reach out to us anytime. We are happy to be a resource and we look forward to working with you to preserve and protect Oregon's superb night skies while diminishing light pollution for the health, safety and well-being of all life.

Thank you,

Board of Directors of IDA Oregon

Bill Kowalik, PhD	Michael McKeag	Cathie Flanigan	Mary Coolidge
Chairperson	Chapter Director	Treasurer	Board Member
bill.kowalik@darksky.org	michael.mckeag@darksky.org	cathie.flanigan@darksky.org	mary.coolidge@darksky.org

www.darkskyoregon.org
https://www.instagram.com/darkskyoregon/
Facebook: International Dark Sky Association - Oregon Chapter

Cc:
Yachats City Council, City Manager, City Planner, Planning Commission
YachatsNews.com
IDA Oregon Board of Directors

Appendix – Selected research papers and news reports on the impact of artificial light at night on marine ecosystems

Artificial light pollution at night (ALAN) disrupts the distribution and circadian rhythm of a sandy beach isopod (2019)
https://www.sciencedirect.com/science/article/abs/pii/S0269749118352503?via%3Dihub

Coastal urban lighting has ecological consequences for multiple trophic levels under the sea (2017)
https://www.sciencedirect.com/science/article/abs/pii/S0048969716322045?via%3Dihub

The nature, extent, and ecological implications of marine light pollution (2014)
https://esajournals.onlinelibrary.wiley.com/doi/abs/10.1890/130281

Mapping the consequences of artificial light at night for intertidal ecosystems (2019)
https://www.sciencedirect.com/science/article/pii/S0048969719332693

Coastal Cities leave up to 75% of seafloor exposed to harmful light pollution (2020)
https://www.nature.com/articles/s41598-020-69461-6
https://phys.org/news/2020-07-coastal-cities-seafloor-exposed-pollution.html
https://www.scientificamerican.com/article/light-pollution-from-coastal-cities-reaches-seafloor/

Coastal light pollution disturbs marine animals, new study shows. (Source: Night-time lighting alters the composition of marine epifaunal communities (2015)
https://royalsocietypublishing.org/doi/10.1098/rsbl.2015.0080
https://www.sciencedaily.com/releases/2015/04/150429090144.htm

University of Washington: Marine Protected Areas Aren't Safe From Light Pollution (2015) (Source: Davies, T.W. et al. 2015. Stemming the tide of light pollution encroaching into Marine Protected Areas. https://conbio.onlinelibrary.wiley.com/doi/full/10.1111/conl.12191.)
http://www.conservationmagazine.org/2015/06/marine-protected-areas-arent-safe-from-light-pollution/

Forbes: Light Pollution Causes Risky Behavior In Fish (2018)
https://www.forbes.com/sites/fionamcmillan/2018/09/23/light-pollution-causes-risky-behavior-in-fish/#37428f5f1270

Light Pollution Identified As Potential Issue For Threatened Puget Sound Chinook Salmon (2018)
http://www.knkx.org/post/light-pollution-identified-potential-issue-threatened-puget-sound-chinook-salmon?utm_source=Sightline%20Institute&utm_medium=web-email&utm_campaign=Sightline%20News%20Selections

Artificial Lighting at Night in Estuaries—Implications from Individuals to Ecosystems (2018)
https://link.springer.com/article/10.1007/s12237-018-0479-3

Yachats Night Lighting & Marine Ecosystems

wsk412@sbcglobal.net <wsk412@sbcglobal.net>

Wed 12/30/2020 2:36 PM

To: Mayor <Mayor@YachatsMail.org>
Cc: Max Glenn <Max@YachatsMail.org>; Jim Tooke <Jim@YachatsMail.org>; Leslie Vaaler <Leslie@YachatsMail.org>; Mary Ellen O'Shaughnessey <MaryEllen@YachatsMail.org>; Shannon Beaucaire <citymanager@YachatsMail.org>; Yachats City Planner <Planner@YachatsMail.org>; happydogs27@gmail.com <happydogs27@gmail.com>; lancebloch1@gmail.com <lancebloch1@gmail.com>; jac.danos@gmail.com <jac.danos@gmail.com>; lorendickinson@gmail.com <lorendickinson@gmail.com>; corchard@peak.org <corchard@peak.org>; office@yachatsyardscapes.com <office@yachatsyardscapes.com>; YachatsNews@gmail.com <YachatsNews@gmail.com>; 'IDA Oregon' <idaoregon@darksky.org>

1 attachments (169 KB)

note_to_Yachats_night_lighting_marine_environment.pdf;

W. John Moore, Mayor of Yachats,

The Oregon Chapter of the International Dark-Sky Association applauds the recent efforts by the City of Yachats to address and minimize intrusive and overly-bright exterior lighting at night.

In support of your efforts, we have prepared the attached letter which gives some background on our organization and lists a number of peer-reviewed research papers on the adverse impacts of artificial light at night on marine ecosystems.

We are happy to be a resource. Please feel free to reach out to us at any time.

Thank you,

Board of Directors of IDA Oregon

Bill Kowalik, PhD
Chairperson
Oregon Chapter of International Dark-Sky Association
bill.kowalik@darksky.org
www.darkskyoregon.org
https://www.instagram.com/darkskyoregon/
Facebook: International Dark Sky Association - Oregon Chapter

Scientific information regarding the affects of artificial light at night on coastal biological ecosystems:

https://www.sciencedirect.com/science/article/abs/pii/S0269749118335656

Abstract

The increase of global light emissions in recent years has highlighted the need for urgent evaluation of their impacts on the behaviour, ecology and physiology of organisms. Numerous species exhibit daily cycles or strong scototaxic behaviours that could potentially be influenced if natural lighting conditions or cycles are disrupted. Artificial Light Pollution at Night (ALAN) stands for situations where artificial light alters natural light-dark cycles, as well as light intensities and wavelengths. ALAN is increasingly recognized as a potential threat to biodiversity, mainly because a growing number of studies are demonstrating its influence on animal behaviour, migration, reproduction and biological interactions. Most of these studies have focused on terrestrial organisms and ecosystems with studies on the effects of ALAN on marine ecosystems being more occasional. However, with the increasing human use and development of the coastal zone, organisms that inhabit shallow coastal or intertidal systems could be at increasing risk from ALAN. In this study we measured the levels of artificial light intensity in the field and used these levels to conduct experimental trials to determine the impact of ALAN on an intertidal fish. Specifically, we measured ALAN effects on physiological performance (oxygen consumption) and behaviour (activity patterns) of "Baunco" the rockfish Girella laevifrons, one of the most abundant and ecologically important intertidal fish in the Southeastern Pacific littoral. Our results indicated that individuals exposed to ALAN exhibited increased oxygen consumption and activity when compared with control animals. Moreover, those fish exposed to ALAN stopped displaying the natural (circatidal and circadian) activity cycles that were observed in control fish throughout the experiment. These changes in physiological function and behaviour could have serious implications for the long-term sustainability of fish populations and indirect impacts on intertidal communities in areas affected by ALAN.

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Abstract

The use of artificial lighting to illuminate the night has provided substantial benefits to humankind. It has also disrupted natural daily, seasonal, and lunar light cycles as experienced by a diversity of organisms, and hence it has also altered cues for the timings of many biological activities. Here we review the evidence for impacts of artificial nighttime lighting on these timings. Although the examples are scattered, concerning a wide variety of species and environments, the breadth of such impacts is compelling. Indeed, it seems reasonable to conclude that the vast majority of impacts of artificial nighttime lighting stem from effects on biological timings. This adds support to arguments that artificial nighttime lighting has a quite pervasive and marked impact on ecological systems, that the rapid expansion in the global extent of both direct illuminance and skyglow is thus of significant concern, and that a widespread implementation of mitigation measures is required.

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Mapping the consequences of artificial light at night for intertidal ecosystems

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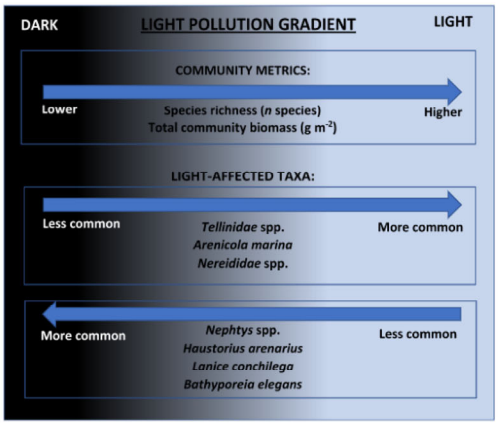
HIGHLIGHTS

- Our coasts are increasingly polluted by artificial light at night (ALAN).
- We studied the potential effects of ALAN in an intertidal sandy shore ecosystem.
- Macrofaunal community structure significantly changed across a gradient in ALAN.
- 47% of non-rare taxa displayed significant relationships to illuminance.
- Relationships with key environmental drivers were accounted for.

GRAPHICAL ABSTRACT



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ABSTRACT

Widespread coastal urbanization has resulted in artificial light pollution encroaching into intertidal habitats, which are highly valued by society for ecosystem services including coastal protection, climate regulation and recreation. While the impacts of artificial light at night in terrestrial and riparian ecosystems are increasingly well documented, those on organisms that reside in coastal intertidal habitats are less well explored. The distribution of artificial light at night from seaside promenade lighting was mapped across a sandy shore, and its consequences for macroinvertebrate community structure quantified accounting for other collinear environmental variables known to shape biodiversity in intertidal ecosystems (shore height, wave exposure and organic matter content). Macroinvertebrate community composition significantly changed along artificial light gradients. Greater numbers of species and total community biomass were observed with increasing illumination, a relationship that was more pronounced (increased effects size) with increasing organic matter availability. Individual taxa exhibited different relationships with artificial light illuminance; the abundances of 27% of non-rare taxa [including amphipods (Amphipoda), catworms (*Nephtys* spp.), and sand mason worms (*Lanice conchilega*)] decreased with increasing illumination, while 20% [including tellins (*Tellinidae* spp.), lugworms (*Arenicola marina*) and ragworms (*Nereididae* spp.)] increased. Possible causes of these relationships are discussed, including direct effects of artificial light on macroinvertebrate behaviour and indirect effects via trophic interactions. With increasing light pollution in coastal zones around the world, larger scale changes in intertidal ecosystems could be occurring.

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1. Introduction

Today around a quarter of the Earth's surface is polluted by artificial light at night (Falchi et al., 2016), originating from industry, residential areas and transportation networks (Bennie et al., 2014; Gaston et al., 2015). A wide range of ecological impacts of this pollution have been identified, including effects on physiology (Navara and Nelson, 2007; Dominoni et al., 2013), navigation (Tuxbury and Salmon, 2005; Rodríguez et al., 2012), reproductive behaviour (Jokiel et al., 1985; van Geffen et al., 2015), predation success (Santos et al., 2010; Underwood et al., 2017), community structure (Davies et al., 2012; Bolton et al., 2017) and ecosystem services (Lyytimäki, 2013).

With widespread coastal urbanization, the impact of artificial light at night on marine ecosystems has become a topic of increasing concern (Becker et al., 2013; Davies et al., 2014; Davies et al., 2016; Bolton et al., 2017). 75% of the world's megacities (populations >10 million) are now located in coastal regions (Luijendijk et al., 2018), and >22% of shorelines worldwide are light-polluted (Davies et al., 2014). The effects of artificial light on shallow marine species, including fish (Becker et al., 2013), amphipods (Navarro-Barranco and Hughes, 2015) and sessile invertebrates (Davies et al., 2015), have been documented in recent years. The consequences of lighting intertidal habitats – which provide valuable ecosystem services globally (Costanza et al., 1997; Barbier et al., 2011) and are likely most exposed among marine ecosystems to light pollution –have more recently become a focus for research (Luarte et al., 2016; Duarte et al., 2019).

Daily, monthly and seasonal natural light cycles play an important role in intertidal ecosystems, synchronising mass spawning and hatching events, partitioning feeding and swimming activity, and regulating migrations (Jansson and Källander, 1968; Forward, 1986; Robles et al., 1989; Naylor, 2001). Species interactions across trophic levels are also guided by light availability, determining the timing and success of predatory activity and the ability of prey to avoid predation (Viherluoto and Viitasalo, 2001; Santos et al., 2010; Underwood et al., 2017). Perhaps most importantly, intertidal invertebrate larvae are guided by light during settlement site selection, which determines subsequent survival and reproductive success (Thorson, 1964; Davies et al., 2014). These key ecological processes that shape intertidal ecosystems are likely affected by light pollution from streets, promenades, piers, jetties, harbours and marinas (Davies et al., 2014). Recent data has demonstrated strong evidence of artificial light impacts including reduced activity and growth rates on individual species that reside in sandy shores (Luarte et al., 2016; Duarte et al., 2019), which are the most widespread of intertidal ecosystems (Brown and McLachlan, 2002), with potential larger scale implications for macroinvertebrate assemblages. The consequences of artificially lighting beaches for the structure and composition of intertidal macroinvertebrate communities, however, remain unquantified.

We mapped the exposure of intertidal organisms in a sandy shore ecosystem to artificial light from High Pressure Sodium promenade lighting, and demonstrate for the first time its consequences for intertidal macroinvertebrate community composition and structure.

2. Methods

2.1. Summary

Ground level night-time artificial illuminance (Lux) was measured across Llandudno West Shore beach in North-West Wales, UK (53.320°N, 3.846°W) and the data used to produce a 6 m resolution light map. Macroinvertebrate communities, sediment grain size (a good proxy of wave exposure [Burt et al., 2010]), and organic matter content were sampled at low, mid and high shore elevations across a gradient in illumination parallel to the shoreline. The relationships between response variables (macroinvertebrate community composition, species richness, species dominance, the total number of individuals, total community biomass, and the presence of individual taxa) and artificial light exposure were quantified accounting for potentially collinear gradients in shore height, median grain size and organic matter concentration.

2.2. Study site

This study was conducted at Llandudno West Shore Beach, a west-facing, macrotidal, sandy beach on the North Wales coast. The northern half of the shore is illuminated by adjacent High Pressure Sodium promenade lighting such that gradients of decreasing illumination are established from high to low shore, and north to south (Fig. 1). The site contains two fish-tail groynes, the larger of which (Gogarth Breakwater) brackets the northern limit of the shore.

2.3. Light mapping

Ground level illuminance was mapped at night at 6 m resolution across 4 transects parallel to the shore (at approximately 0, 40, 100 and 200 m from the sea wall) using a Skye® LUX sensor logging every 5 s. Measures were GPS linked so that a prediction surface map of illuminance could be interpolated from the data using an exponential kriging model in ArcGIS. The light data was collected between 12:30 and 2:30 am on the 11th of June 2018 during a new moon to avoid moonlight interference.

2.4. Shore sampling

One macroinvertebrate and two sediment samples were extracted from 54 sampling stations across the measured illumination gradient along horizontal transects (approximately 900 m in length) at three shore heights representative of the full gradient of zonation (Fig. 1). Each transect occupied a 50 cm elevation zone, relative to Ordnance Datum Newlyn: high shore (1 to 1.5 m), middle shore (−0.25 to 0.25 m) and low shore (−1.5 to −1 m); and contained 18 sampling stations positioned randomly within 40 m intervals along the transect. Sampling was undertaken either side of the smaller groyne to control for effects of potentionally colinear variables known to influence community composition (grain size and organic matter content) (Bull et al., 1998; French and Livesey, 2000; Walker et al., 2008; Fanini et al., 2009). 89% of the samples (16 stations on each transect) were collected over 3 consecutive days (20th–22nd June 2018), with the final 11% collected 10 days later on a day with comparable weather conditions, using the same equipment and consistent methods. All sampling was undertaken at low/retreating tide.

At each station a macroinvertebrate sample (0.1 m^2 to 0.2 m depth) was dug and wet sieved through a 1 mm mesh, and two small sediment cores (0.008 m^2 to 0.2 m depth) were extracted for grain size and organic matter content analysis. Macroinvertebrate samples were preserved in 70% Industrial Methylated Spirit with rose bengal pending lab analysis, and all specimens were identified to the lowest practicable taxonomic resolution, counted and weighed. One sediment sample from each station, after washing and drying, was shaken for 15 min through a stack of brass sieves with decreasing mesh sizes (4 mm, 2 mm, 1 mm, 500 μm, 250 μm, 125 μm, 63 μm). The remaining sediment in each sieve was weighed, and median grain size was calculated using GRADISTAT v 8.0 (Blott and Pye, 2001). The remaining sediment samples were dried and then heated in a muffle furnace at 450 °C for 4 h to burn off any organic matter, with the resulting differences in the weights of the samples used to calculate organic matter concentrations (Cambardella et al., 2001).

2.5. Statistical analysis

Data analysis was performed using R statistical software. The relationship between macroinvertebrate community composition and artificial light exposure (ground-level illuminance) was examined using a

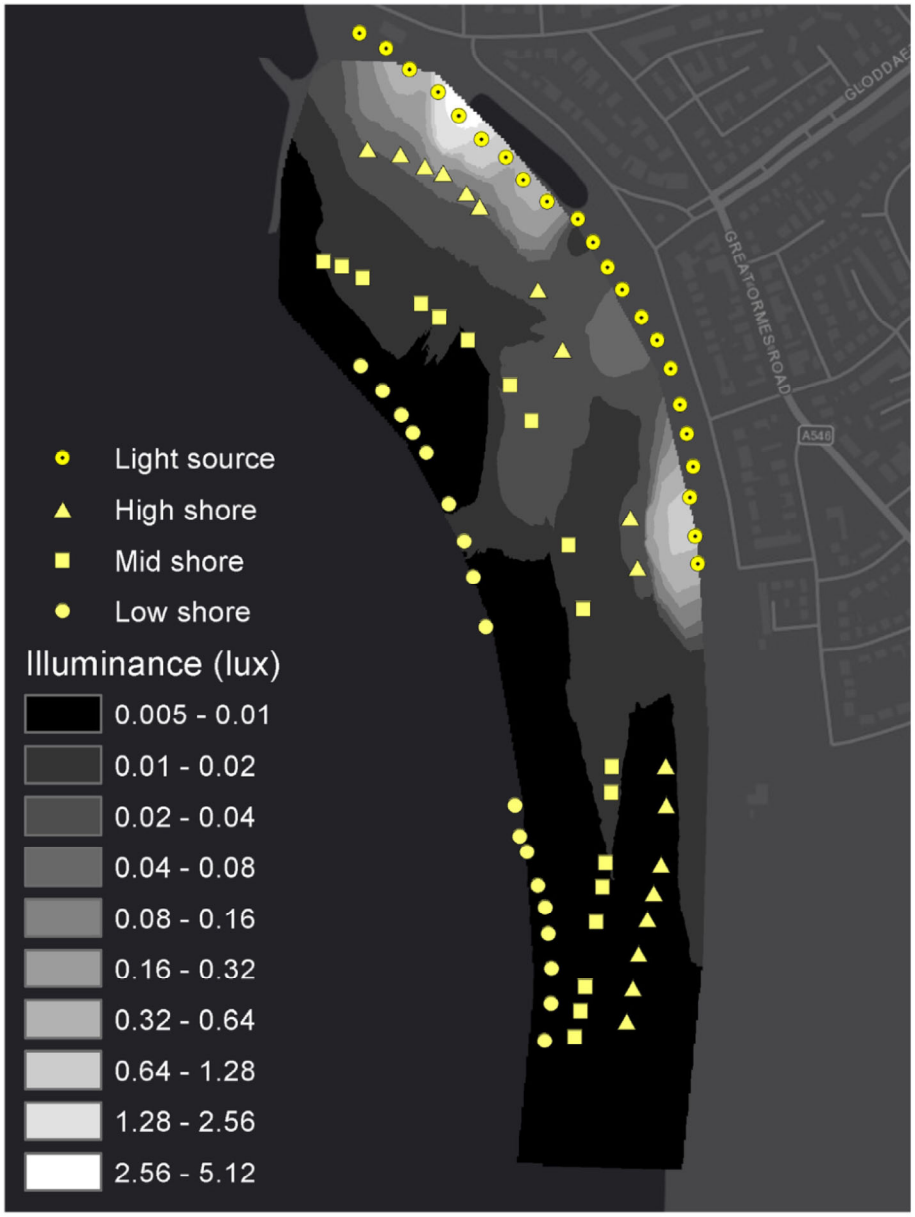

Fig. 1. The distribution of artificial light at night from High Pressure Sodium promenade lighting across Llandudno West Shore Beach, North Wales.

permutational multivariate analysis of variance (adonis, CRAN: vegan), performed on Bray-Curtis dissimilarity matrices calculated from log-transformed species abundance and biomass, accounting for shore height, particle size and organic matter. All first order effects and second order interactions with light were included in the model.

The relationships between macroinvertebrate community metrics (total number of individuals [n m^{-2}], total biomass [g m^{-2}], species richness [species count] and species dominance [1 – Pielou's evenness]) and environmental variables (artificial illuminance, shore height, particle size, organic matter) were quantified using multiple regression models fitted using either spatially autocorrelated mixed effects models (corrHLfit, CRAN: spaMM) or generalised linear models with appropriate error distributions where spatial autocorrelation was not identified in the response variable of interest (determined using Mantel tests).

Model selection (model.sel, CRAN: MuMIn) was used to compare the small-sample-size corrected values of Akaike's Information Criterion (AIC) of a series of candidate regression models, including the global model (~illuminance * shore height + illuminance * particle size + illuminance * organic matter), all possible nested models of the global model, and a null (~intercept only) model (Table 2). The most parsimonious models were tested for significance by comparing to a null model using a likelihood ratio test. Where the most parsimonious models were significantly different from the null, and included the illuminance predictor variable, the significance of this variable was further tested using a likelihood ratio test comparing the model with a nested model in which the illuminance variable was omitted. If the model included a second order effect of illuminance, the significance of the effect was determined by testing the model against itself but with the interaction removed.

The relationships between the abundances of individual macroinvertebrate species and environmental variables were also examined using multiple regression model selection, as previously described, identifying the most parsimonious model for each species and testing the significance of illuminance when present as a predictor variable. The abundances of rarer species were summed by genus or family (Table 3) to reduce zero inflation. Analyses were performed on numerical abundance data for taxa present in >50% of samples, and presence-absence data for taxa present in <50% of samples, with appropriate error

distributions fitted in each case. Any taxa that were present in <10% of the samples were deemed too rare to be reliably incorporated in the analysis.

3. Results

The light data displayed an exponentially decreasing gradient in illuminance from high to low shore adjacent to the lamp-posts (Fig. 1), ranging from 5 lx on the promenade, equivalent to a typical residential side street (Gaston et al., 2013), to 0.006 lx, with the lowest values found in the far south and on the low shore directly next to Gogarth Breakwater. Median grain size on the intertidal shore ranged from 142 to 169 μm (fine sand), with the organic matter concentration of the sediment between 0.3 and 0.9%. Gradients in grain size and organic matter were not collinear with illuminance (variance inflation factor [VIF] values <3).

The beach contained an abundance of intertidal macroinvertebrates (median: 180 n m^{-2}), with a total of 1984 individuals collected, representing 45 species and 26 families. The macroinvertebrate assemblages on the shore predominately consisted of crustaceans (70%), polychaetes (26%) and bivalves (3%) [percentages by abundance]. There was no significant difference in the structure of the community sampled between different survey days, with regard to abundance ($F_{(3,50)} = 1.29$, $p = 0.29$), biomass ($F_{(3,50)} = 0.84$, $p = 0.48$), species richness ($F_{(3,50)} = 1.84$, $p = 0.15$) or species dominance ($F_{(3,48)} = 0.94$, $p = 0.43$).

Macroinvertebrate community composition across the shore was significantly related to the degree of exposure to artificial light at night, accounting for other environmental variables (shore height, particle size and organic matter), and regardless of whether abundance or biomass was used (n individuals m^{-2}: $F_{(44,53)} = 2.26$, $p < 0.05$; g m^{-2}: $F_{(44,53)} = 2.52$, $p < 0.01$; Table 1).

Artificial illuminance (lux) was included in the most parsimonious models describing the species richness and total community biomass of macroinvertebrates (Table 2). The relationship between light and these responses was modulated by organic matter content (Species richness: $x^2 = 46.90$, $p < 0.01$; Biomass: $x^2 = 8.42$, $p < 0.01$). The selected model (Lux * Organic) described significantly more of the variability in these responses compared to a null (~intercept only) model (Species richness: $x^2 = 81.56$, $p < 0.01$; Biomass: $x^2 = 2.72$, $p < 0.001$). Species richness and biomass (Fig. 2) increased with increasing illuminance; relationships that became more positive with increasing organic matter availability (Fig. 3). The cumulative abundance and species dominance of the macroinvertebrate community were not strongly related to artificial light exposure, with the illuminance model (~Lux) describing no more variation in the responses than the null model (Abundance: $x^2 = 0.56$, $p = 0.11$; Dominance: $x^2 = 0.01$, $p = 0.67$).

Out of the 15 common taxa of macroinvertebrates found on the shore, the abundances of 7 taxa (47%) displayed significant relationships with artificial light exposure accounting for other environmental variables (Table 3). Four of these taxa decreased in either abundance or probability of occurrence with increasing illuminance, including amphipods (*Bathyporeia elegans* and *Haustorius arenarius*), catworms (*Nephtys* spp.) and sand mason worms (*Lanice conchilega*), while the remaining 3 taxa increased in probability of occurrence with increasing illuminance: *Tellinidae* spp., *Arenicola marina* and *Nereididae* spp. (Fig. 4).

Table 1
The relationship between macroinvertebrate community composition and artificial light exposure from High Pressure Sodium promenade lighting in a sandy shore ecosystem. Permutational multivariate analysis of variance was performed on Bray-Curtis dissimilarity matrices calculated from log-transformed species abundance and biomass data. The tested model included first order effects of all physical variables, and interactions with illuminance. Results that are significant at the 95% confidence level or greater are underlined.

Predictor	Community composition response			
	Abundance		Biomass	
	$F_{(44,53)}$	p	$F_{(44,53)}$	p
Illuminance (lux)	2.26	<0.05	2.52	<0.01
Shore height	5.97	<0.001	3.71	<0.001
D50 (μm)	1.90	0.089	1.98	<0.05
Organic matter (%)	3.10	<0.01	2.33	<0.01
Lux:Shore height	1.50	0.120	1.35	0.117
Lux:D50	0.74	0.589	1.39	0.139
Lux:Organic	1.23	0.321	1.62	0.076

Table 2
Selection of the most parsimonious models describing how macroinvertebrate abundance (n m^{-2}), biomass (g m^{-2}), species richness (species count) and species dominance (1 - J′) vary with exposure to High Pressure Sodium promenade lighting, and other physical variables in a sandy shore ecosystem. AICc values of the most parsimonious models are underlined and bold.

Model	AICc			
	Abundance[a]	Biomass[a]	Richness[b]	Dominance[c]
Lux * Shore height + Lux * D50 + Lux * Organic	67.8	58.5	269.4	−24.4
Lux * Shore height + Lux * Organic	63.0	55.8	266.5	−20.4
Lux * D50 + Lux * Organic	74.6	50.2	259.9	−21.9
Lux * Shore height + Lux * D50	63.4	60.3	267.8	−25.3
Lux * Shore height	59.6	61.3	267.4	−16.8
Lux * D50	78.4	53.2	262.0	−17.2
Lux * Organic	70.8	**49.5**	**256.8**	−17.7
Lux	76.5	54.4	260.2	−9.8
Shore height + D50 + Organic	58.0	60.4	264.2	−26.7
Shore height + D50	59.3	59.2	261.7	−23.3
Shore height + Organic	55.5	62.5	265.5	**−26.1**
Shore height	**56.9**	62.3	263.1	−21.3
D50 + Organic	72.6	62.9	266.4	−24.1
D50	75.5	61.3	264.3	−19.6
Organic	72.1	62.3	265.0	−19.0
Null	76.8	61.6	262.9	−11.6

[a] Gaussian GLM performed on $\log_{10}(x + 1)$ transformed data.
[b] Gaussian GLM performed on raw data.
[c] Poisson GLM performed on raw data.

4. Discussion

Macroinvertebrate community composition is known to be affected by artificial light at night in a variety of ecosystems, including terrestrial ground-dwelling communities (Davies et al., 2012; Davies et al., 2017; Manfrin et al., 2017), sessile marine epifaunal communities (Davies et al., 2015; Bolton et al., 2017) and riparian ecosystems (Meyer and Sullivan, 2013). To our knowledge the results presented here represent the first evidence of artificial light altering macroinvertebrate community structure and composition in a sandy shore ecosystem. Macroinvertebrate assemblages in sandy shore habitats - which make up around 75% of the world's ice-free coastlines (Brown and McLachlan, 2002) - are critical to ecosystem functioning and connectivity. They contribute to sediment aeration, facilitating organic matter mineralisation and nutrient cycling, form planktonic linkages between distant habitats, and provide important resources for top consumers such as birds and fish (Brauns, 2008; Schlacher et al., 2008).

Our study found changes in the community composition, species richness and cumulative biomass of macroinvertebrates that were related to the level of exposure to artificial light pollution from adjacent High Pressure Sodium promenade lighting with illuminances equivalent to residential side streets (Gaston et al., 2013). While our study was limited to one shore line, the relationships between macroinvertebrate community descriptors and artificial illumination were quantified accounting for key structural drivers in intertidal ecosystems (shore elevation, and wave exposure), which are also strongly linked with groyne proximity, hence we are confident that the results presented constitute evidence of artificial light impacts in the focal study system.

The effects of anthropogenic structures such as groynes on sandy shore ecosystems are well established (French and Livesey, 2000;

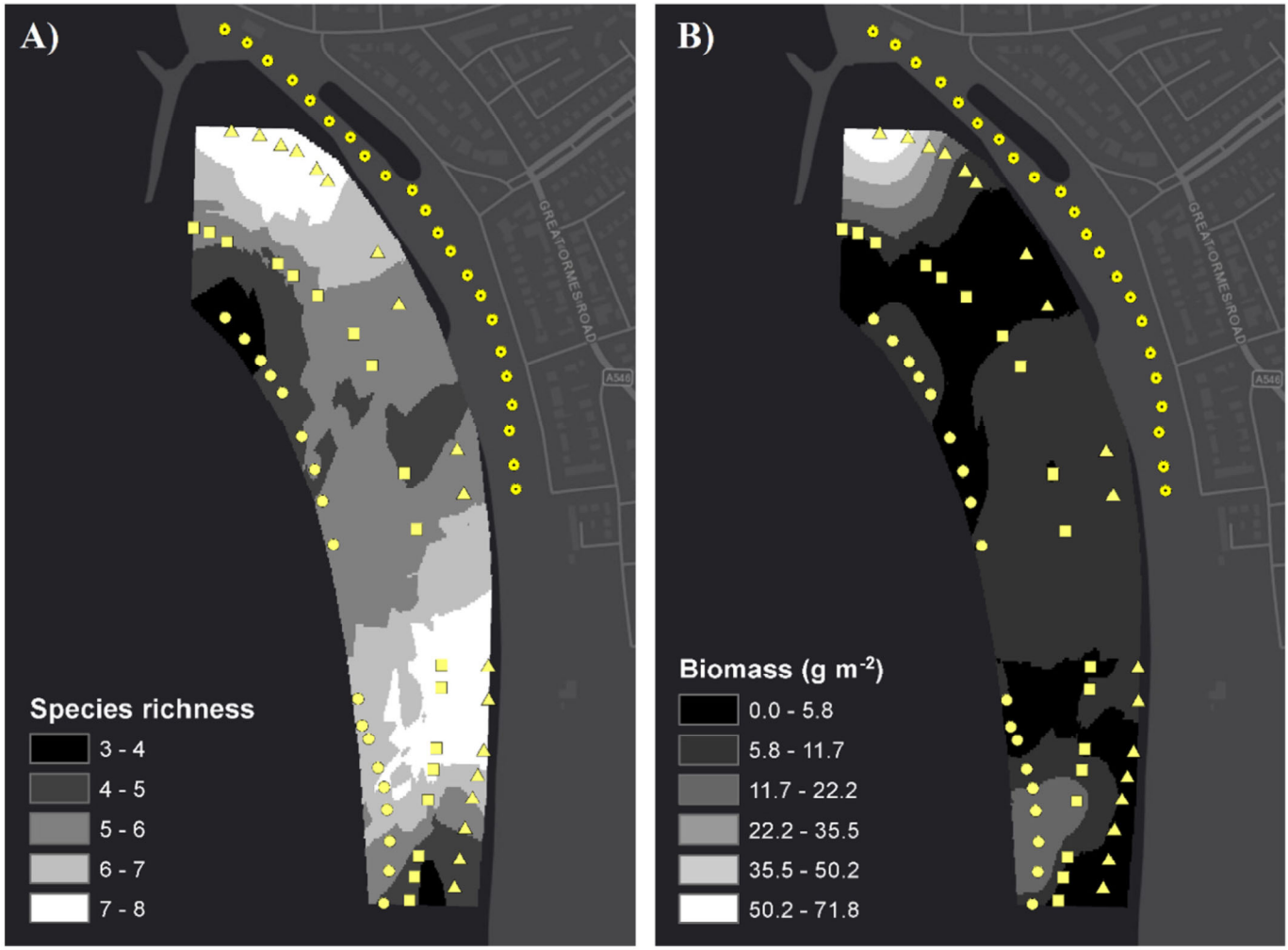

Fig. 2. Macroinvertebrate community structure metrics that were significantly related to artificial light exposure from High Pressure Sodium promenade lighting: A) species richness (species count); B) cumulative biomass (g m^{-2}).

Martin et al., 2005; Walker et al., 2008; Fanini et al., 2009). Reduced wave exposure on the intertidal shore due to sheltering by anthropogenic structures often leads to changes in the sediment characteristics of the beach with regard to particle sizes and organic content, which in turn drive changes in macroinvertebrate assemblages (Martin et al., 2005; Rodil et al., 2007; Walker et al., 2008). These effects were given careful consideration during study design, and controlled for by sampling either side of the groyne structures, and in the analysis by including median grain size and organic matter content as candidate variables during the model selection procedure. We are therefore confident that the results reported here are not artefacts of groyne effects.

47% of non-rare taxa were individually found to either increase or decrease in abundance (or the probability of occurrence) with increasing illumination, accounting for shore height and sediment characteristics, including common intertidal species such as polychaetes (*Nephtys* spp., *Lanice conchilega*, *Arenicola marina*, *Nereididae* spp.), amphipods (*Bathyporeia elegans*, *Haustorius arenarius*) and bivalves (*Tellinidae* spp.). Although the mechanisms responsible for these relationships are uncertain, there are a range of possible explanations based on the known influences of light in intertidal systems, which encompass direct effects of artificial light on macroinvertebrate life cycles, and indirect effects due to trophic interactions.

Multiple aspects of marine macroinvertebrate reproductive biology are guided by natural light cues, including synchronised broadcast spawning, larval phototaxis, and recruitment (Thorson, 1964; Bentley et al., 2001; Naylor, 2001). The adult stages of mobile marine macroinvertebrates can also be highly photosensitive with taxa displaying both positive and negative phototaxis (Tranter et al., 1981; Del Portillo and Dimock Jr, 1982; Adams, 2001). Marine amphipods, for example, are known to be strongly attracted to artificial lights (Meekan et al., 2001; Hughes and Ahyong, 2016), with assemblages of subtidal amphipods aggregating in halogen light traps with intensities equivalent to average levels of coastal light pollution (Navarro-Barranco and Hughes, 2015). As is the case for many taxa displaying this aggregation response (for example Lepidoptera, Araneae and Coleoptera), the mechanism of disruption remains unclear. Orientation using the lunar and solar compass is, however, common in some intertidal amphipod species (Ugolini et al., 2005; Ugolini et al., 2012), and artificial light disruption of this compass is plausible.

As with many other groups (Rydell, 1992; Becker et al., 2013), aggregation in illuminated areas will increase the vulnerability of intertidal macroinvertebrates to predation. Increases in the abundance of predators as a result of artificial light has been previously reported in a variety of ecosystems and species, from coastal fish (Becker et al., 2013) to bats (Rydell and Racey, 1995) and ground-dwelling insects and arachnids (Davies et al., 2012), and can lead to significant changes in the composition of prey communities within illuminated areas (Bolton et al., 2017). In the same manner that bats target moths and other flying insects around streetlights (Rydell, 1992; Acharya and Fenton, 1999; Minnaar et al., 2015), wading birds are attracted to the nocturnal foraging opportunity posed by light-polluted intertidal shores (Santos et al., 2010). Taking advantage of artificial illumination, these birds alter

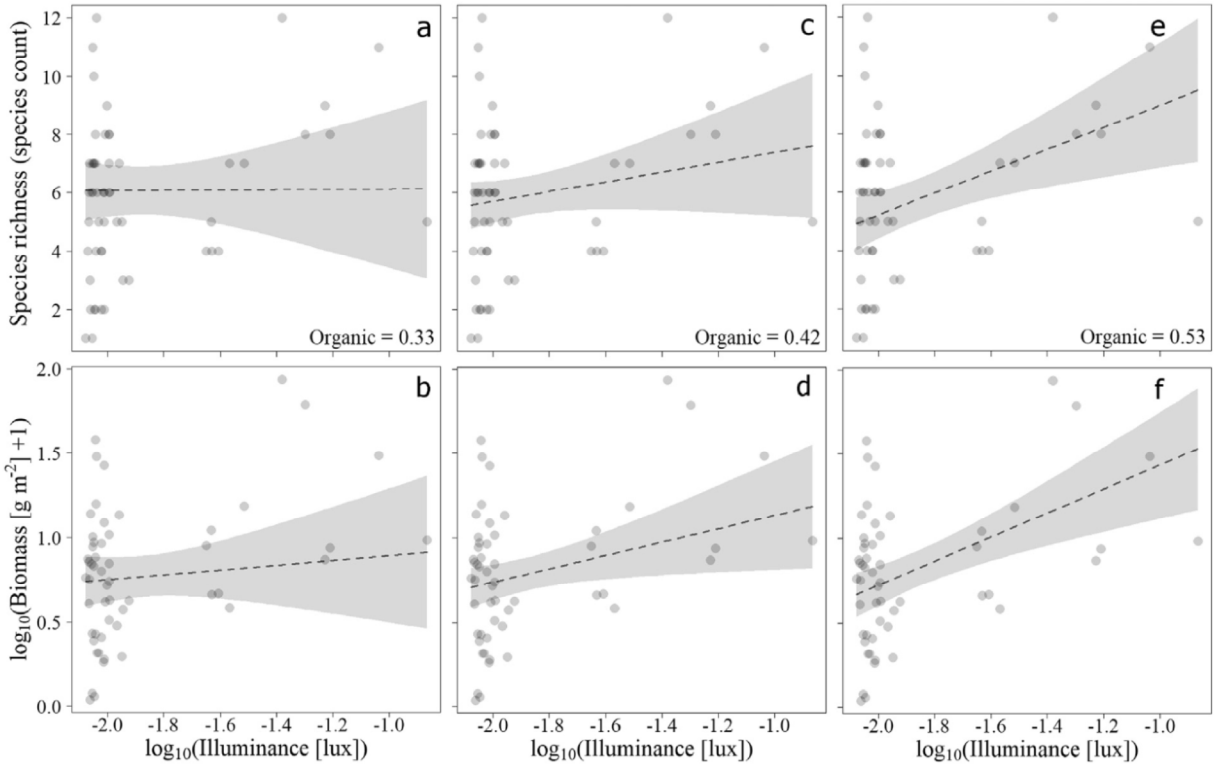

Fig. 3. The effects of artificial light at night from High Pressure Sodium lighting on macroinvertebrate species richness and biomass at high (a–b), medium (c–d), and low (e–f) organic matter content in a sandy shore ecosystem. Relationships (dashed lines) are presented from the most parsimonious generalised linear models (Table 2) which included artificial light exposure and were significantly different from a null (intercept only) model. A significant interaction between artificial light exposure and organic matter content was present in both cases, presented here using the lower quartile, median and upper quartile values of organic matter concentration (%). Grey regions indicate the 95% confidence intervals of these relationships.

their feeding strategy from tactile to sight-based foraging (Dwyer et al., 2013), displaying increased intake rates of macroinvertebrate prey compared to non-illuminated regions (Santos et al., 2010).

The negative effect of artificial light exposure on the prevalence of amphipods (*Bathyporeia elegans* and *Haustorius arenarius*) in the current study, which constitute the prey of wading birds (Goss-Custard and Jones, 1976; Evans et al., 1980), could be due to light-attracted aggregations being targeted by foragers. Similarly, two polychaete taxa also displayed negative relationships to artificial illuminance: catworms (*Nephtys* spp.) and sand mason worms (*Lanice conchilega*), which are two of the most common prey groups in the diet of intertidal foraging birds (Goss-Custard and Jones, 1976; Yates et al., 1993; Petersen and Klaus-Michael, 1999).

Intertidal macroinvertebrates are known to be threatened by a variety of anthropogenic pressures, such as coastal development, pollution discharge and climate change (Brown and McLachlan, 2002; Schlacher

Table 3
Examining the relationships between the abundances of common macroinvertebrate taxa and exposure to High Pressure Sodium promenade lighting in a sandy shore ecosystem. Commonality is defined as the percentage of samples individual taxa were found in. The percentage contribution of each taxon to the total abundance and biomass of the macroinvertebrate community is also displayed, along with the formula of the most parsimonious model describing those predictor variables which shaped either the abundance or presence of each taxon. Taxa affected by artificial light underlined.

Taxon	Proportion of samples (%)	Proportion of abundance (%)	Proportion of biomass (%)	Model formula
Nephtys spp.[a]	70.4	8.7	9.9	Lux * Organic + D50
Bathyporeia pilosa[a]	66.7	49.9	4.0	Shore height
Spionidae spp.[b]	50.0	4.8	3.6	Shore height
Orbiniidae spp.[b]	37.0	2.4	7.5	Null
Crangon crangon[b]	35.2	2.6	1.5	Organic
Tellinidae spp.[b]	35.2	2.3	14.3	Lux * Organic + D50
Lanice conchilega[b]	33.3	6.4	4.8	Lux + Organic
Bathyporeia elegans[b]	25.9	3.8	0.2	Lux + Shore height
Haustorius arenarius[b]	24.1	2.7	2.8	Lux * Organic
Phyllodocidae spp.[b]	22.2	0.8	0.04	Shore height
Eurydice pulchra[c]	18.5	10.5	1.2	Shore height
Cerastoderma edule[b]	14.8	0.7	34.1	Null
Arenicola marina[b]	13.0	0.5	11.9	Lux
Nereididae spp.[b]	13.0	1.2	1.7	Lux
Semelidae spp.[b]	11.1	0.4	0.01	Null
Sum	NA	97.6	97.6	NA

[a] Poisson GLM performed on raw abundance (n m^{-2}) data.
[b] Binomial GLM performed on presence/absence data.
[c] Spatially autocorrelated binomial model (corrHLfit) performed on presence/absence data.

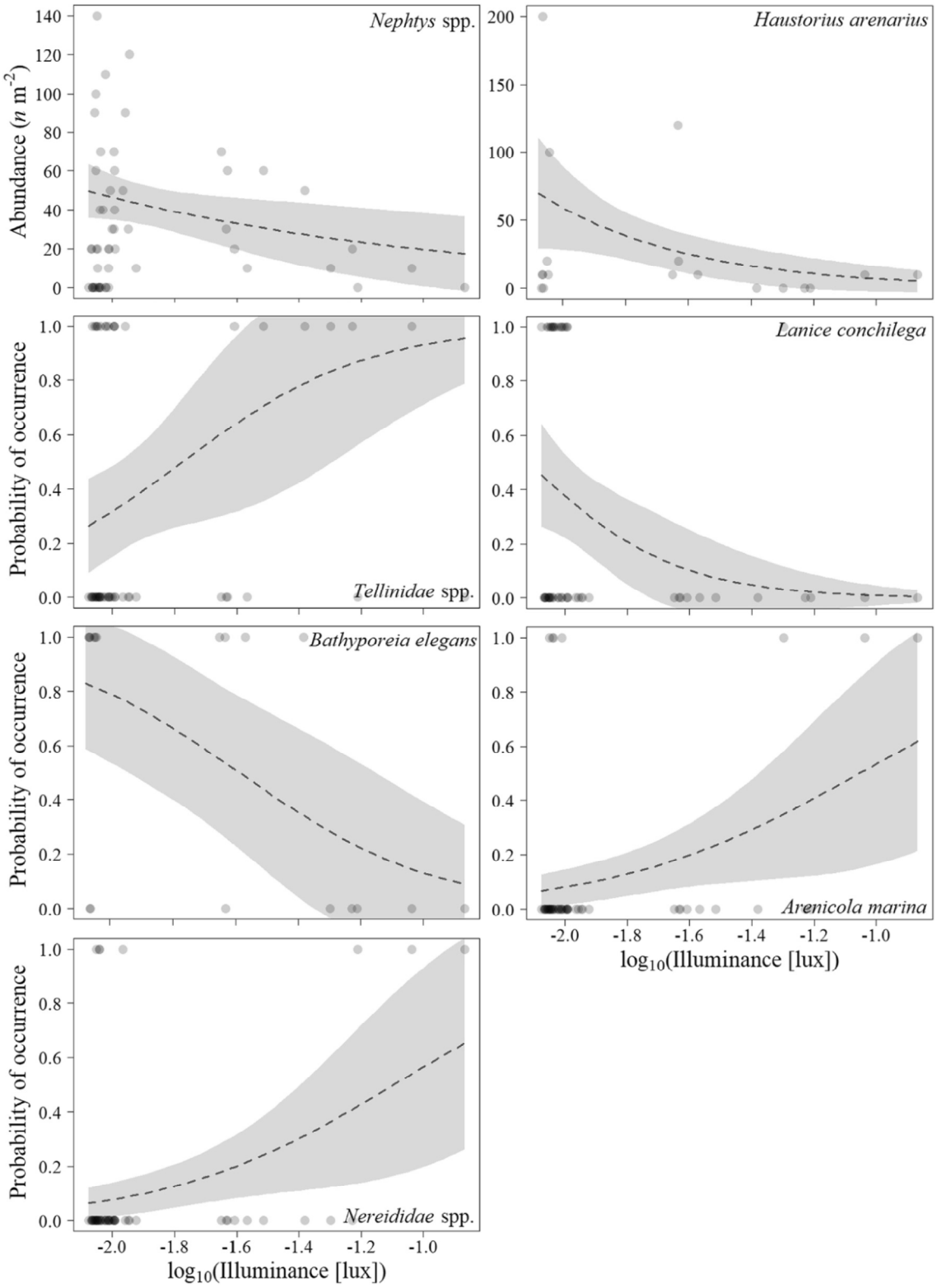

Fig. 4. Intertidal macroinvertebrate taxa with abundances or occurrences significantly related to artificial light at night from High Pressure Sodium promenade lighting in a sandy shore ecosystem. The relationship between artificial light exposure and each abundance measure (dashed lines) were identified as the most parsimonious generalised linear models that were significantly different from a null (intercept only) model. Grey regions indicate the 95% confidence intervals of these relationships. *Nephtys* spp. and *Haustorius arenarius* were analysed using Poisson GLMs performed on abundance data, while binomial GLMs performed on presence/absence data were used for the remaining taxa.

et al., 2007; Defeo et al., 2009). However the impact of artificial light pollution remained unconsidered until recent years (Luarte et al., 2016; Duarte et al., 2019). This study demonstrates that artificial light pollution can alter intertidal macroinfaunal communities in sandy beach ecosystems. With 75% of the world's megacities located near coastlines (Luijendijk et al., 2018), the potential for widespread artificial light at night in coastal regions (Davies et al., 2014) to alter the biogeographical distributions of intertidal organisms is clear. It may prove possible to

reduce these impacts by limiting the period, intensity and dispersal of lighting, as well as altering the types of lights used and their spectral composition (Gaston et al., 2012; Rajkhowa, 2012).

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CRediT author statement

Matthew J. Garratt: Methodology, Formal Analysis, Investigation, Writing-Original Draft, Visualisation. **Stuart R. Jenkins**: Writing-Review & Editing, Supervision, Project Administration, Funding Acquisition. **Thomas W. Davies**: Conceptualization, Methodology, Formal Analysis, Writing-Review & Editing, Visualisation, Supervision, Project Administration, Funding Acquisition.

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Environment • Planet Earth

Why Dark Sky Tourism Is Catching On

By Michael d'Estries Updated December 16, 2019

An individual silhouetted against a backdrop of stars in Queensland, Australia. (Photo: Dualiti Photos [CC by 2.0]/Flickr)

In the fight to protect natural wonders around the world from pollution, development and other man-made byproducts of our modern world, it's an overlooked fact that we're on the verge of losing one of our most enchanting. Even more ironic, it's not something that requires travel or tickets to experience. The

There are, however, efforts underway to protect what vestiges of the unspoiled night remain. Organizations like the International Dark-Sky Association (IDA), which works with land owners and municipalities to protect vast areas under pristine dark skies for future generations, has to date designated 15 dark sky reserves around the world. The IDA has also designated over 65 smaller, but still impressive, dark sky parks throughout the United States. As interest in astrotourism has increased, communities have also embraced their fortunate settings under starlight to offer stargazing tours, events around spectacles like solar eclipses and even rocket launch viewing parties.

And now, thanks to travel writer and astrotourism guide Valerie Stimac, we have a single catalog of the opportunities available to look up in wonder at the heavens above. Her new book "Dark Skies: A Practical Guide to Astrotourism," not only features 35 of the darkest stargazing places around the world, but also highlights annual spectacles like meteor showers, the best place to catch the northern (or southern) lights, rocket launch sightseeing and even details on the major eclipses of the next decade and where to watch them.

The new Lonely Planet book 'Dark Skies,' by Valerie Stimac, offers an in-depth guide to the world of astrotourism. (Photo: Valerie Stimac/Lonely Planet)

able to tackle the list of topics quickly to decide where we wanted to include and how to organize the book. After that, it was a lot of researching, writing, and working with sources around the globe!"

Valerie Stimac under a starry night sky. (Photo: Valerie Stimac)

Stimac, who chronicles her travels around the globe (and offers tips for those looking to do the same) through her site Valerie & Valise, said she's deeply encouraged by interest across a lot of the different types of astrotourism.

"Obviously seeing rockets and the northern lights have always been popular; eclipse-chasing has grown more since the 2017 total solar eclipse too," she added. "Traveling for dark sky experiences is probably among the newest 'type' of astrotourism, and the International Dark-Sky Association has done a great job of generating excitement and interest in these locations – and showing how astrotourism is often a great complimentary activity for travel to spots that are also great natural destinations during the day."

Arches National Park, one of over 65 dark sky parks in the U.S. as designated by the International Dark-Sky Association, is a popular attraction for stargazers. (Photo: By Jun Su/Shutterstock)

While Stimac praised organizations like the IDA for doing a fantastic job of helping to protect pristine regions from encroaching light pollution, one of the biggest challenges faced is that astrotourism is still a young industry. "Not everyone is interested and/or willing to travel for these experiences," she shared.

Worse still, some areas lack both the financial and organizational resources to attract potential stargazers.

"Personally, I think the most endangered dark sky locations are those where there's no tourism infrastructure in place," she said. "For example, Wadi Rum in Jordan is a spectacular stargazing spot, but there's no CVB/DMO (Convention and Visitors Bureau/Destination Marketing Organization) there to help petition for dark sky designation status, so it's unlikely that development there will be done in a way that reduces light pollution.... and that will hurt the destination in the long run."

Joshua Tree National Park, California

The Milky Way rising over the rugged and rocky terrain of Joshua Tree National Park. (Photo: By Saptashaw Chakraborty/Shutterstock)

Designated a Dark Sky Park by the IDA in 2017, Joshua Tree National Park is a popular attraction for stargazers living on the west coast. Despite encroaching light pollution on its western borders from Coachella Valley cities, its relative isolation from major cities in the east (with Phoenix being the closest metropolitan area some 300 miles away), provides it with some of the darkest skies in California.

"While Joshua Tree National Park has an unfortunate amount of light pollution in the larger region, it's dark enough and such an otherworldly landscape that it's still an unforgettable place to go stargazing," Stimac said of the 790,000-acre park. "There's also a really low development footprint within the park so it's very quiet and isolated – totally like another planet or moon!"

Elqui Valley, Chile

A long exposure shot of the beautiful night sky above the Elqui Valley in Chile. (Photo: By Pung/Shutterstock)

A popular wine region centered on the Elqui River in northern Chile, the Elqui Valley also offers ideal conditions (high-altitude, low-population, limited cloud cover) for uncorking a bottle and toasting the heavens above. Spanning some 90,000 acres, the region has the distinction of being named the first-ever Dark Sky Sanctuary by the International Astronomical Union in 2015. It's also home to nearly a dozen observatories, boutique stargazing hotels and a large variety of tours that cover both cosmic and daytime spectacles.

"This was the first place I saw the southern night sky, and was amazed by how different the Milky Way and constellations look," said Stimac. "It was also a treat to see the Magellanic Clouds for the first time."

Wadi Rum, Jordan

The Milky Way in Wadi Rum, Jordan. (Photo: By Zaid Abu Taha/Shutterstock)

been nicknamed "Mars on Earth."

"I'm partial to Jordan because I'm leading a tour group here in March!," said Stimac. "Wadi Rum is an incredible landscape too (used for a lot of sci-fi movies like 'Prometheus,' 'Rogue One' and 'The Martian') and it's one of the dark places where you can just sit and look up at the wonder of the night sky with very little interruption."

Environment

The World's 11 Certified Dark Sky Reserves, Where the Stars Run Riot

Space

19 Dark Sky Parks Where the Heavens Steal the Show

Outdoors

3 New Dark Sky Parks Reveal Wonders of the Night Sky

Space

The First Dark Sky Reserve in the U.S. Is a Stargazer's Paradise

Pollution

Why Dark Skies Matter

Pollution

5 Ways You Can Reduce Light Pollution

Space

Stunning Photo Project Explores Our Complex Relationship With the Night Sky

Space

33 Out-Of-This-World Images of the Milky Way, Aurora Borealis and More

Conservation

These 2 Towns Have Dimmed Their Lights to Show Off the Glorious Night Sky

Environmental Policy

Welcome to Niue, the First Country Recognized as a Dark Sky Place

Outdoors

International Dark Sky Park Opens in Michigan; Only 9 Others in the World

Travel

10 Unforgettable Desert Adventures

Space

What to See in the Night Sky in 2020

Pollution

England's 'Cosmic Census' Reveals Scale of Light Pollution

Pollution

Does an Empty Baseball Field Really Need Outdoor Lighting All Night?

Pollution

We're Losing the Nighttime Sky

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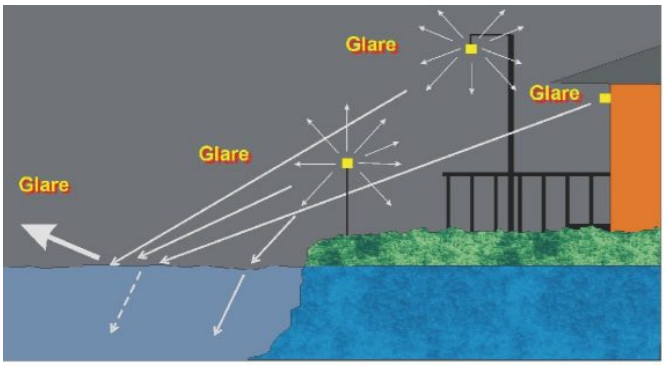
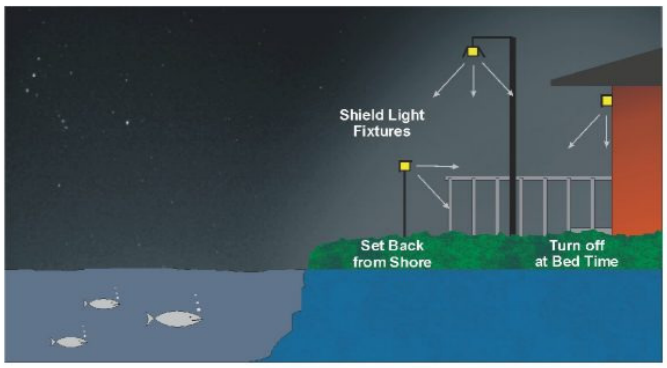




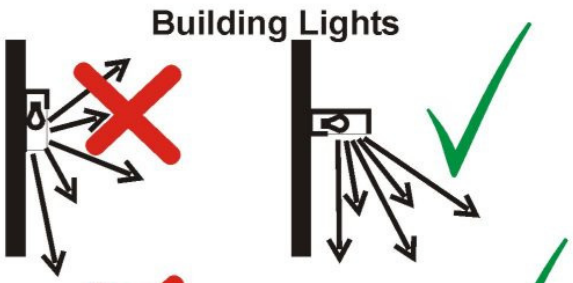
The Bad and the Good
Shoreline Lighting

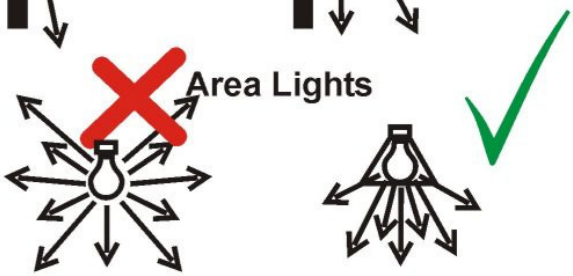
White Stone on Pathway
and Shielded Bollard

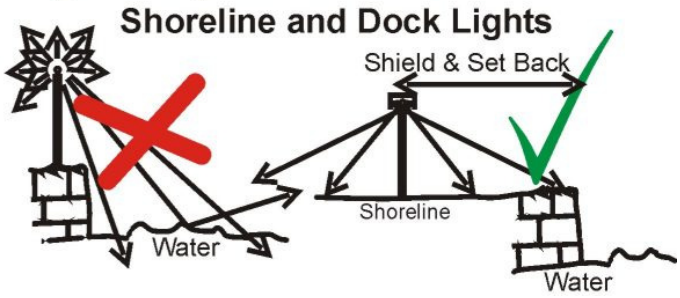
Use "Warm Light"
- not white light

Use Timers
- on at sunset
- off 2-hours later

Use Motion Sensors
- lights on only
when needed







12-01-2020

JGD

Planning Commission Special Work Session: Lighting Ordinance

Purpose of the ordinance:

Why do we develop and put into effect ordinances such as the current lighting ordinance under discussion? In my humble opinion, it is in order to set in place rules and parameters around which a community develops in the hopes of maintaining the values and desires of the residents of the City. The municipal code was put in place as a mechanism to help our citizens to be able to easily understand what is allowed and what is not allowed within the built environment. I think that we all agree that our ordinances are not enacted to punish existing homeowners or businesses. The proposed lighting ordinance is being enacted in large part to protect rather than punish residents and so that new and remodelled construction projects now have parameters by which to design outdoor lighting.

Yachats doesn't differ from any developed small American town. Walking and driving around Yachats with John, who has 30 years in electrical lighting design and construction experience and who has offered to assist this commission, at least 85% of existing exterior light fixtures will not meet the requirements of our proposed ordinance. Should we pass the Ordinance, that does not mean that the code enforcement officer will be canvasing the community giving out notices of non-conformity. What the Ordinance will provide is a mechanism that the residents can cite to lodge a complaint about any light fixtures that are a nuisance. If a neighbor, whether it is a resident or a business, has a light shining into someone's home this ordinance will give teeth to helping alleviate the situation. Enacting the ordinance doesn't mean that suddenly every homeowner and business needs to change out every outdoor light fixture. Practically speaking, if the lighting isn't bothering anyone it will not need to be changed.

section 9.42.040 D. Marine Lighting prohibited or curfew or alternative lights?

By definition, "marine lighting" means exactly that – marine lighting. Whether the lights shine far out onto the ocean or in close on the rocky shore the stated purpose of marine lighting is to light the natural environment. Any light fixture that is directed off of the coastline is marine lighting, does nothing with regards to safety and should not be allowed. Attached are a few examples of the scientific data regarding artificial light at night and the marine environment, including near shore shallow waters.

The ***Yachats Vision Statement*** begins with **"*Our village is a place where natural resources are valued and protected, …*"**. Decades of research has shown how harmful artificial light is for the natural environment on land and is now beginning to find evidence of the harm done along the shorelines as well. If Yachats truly believes in the Vision Statement, then marine lighting needs to be disallowed.

In response to the use of flood lights that are used as both marine , pathway lighting and for safety :

If clear paths for safe walking are the issue then the best lighting, as well as the least intrusive, are low pathway lights that illuminate the pathway rather than everything else around it. At night human beings' eyes have evolved to adjust to the lower level of light from moonlight. Human visual abilities degrade starting at about the age of 40 so bright white light causes glare and difficulty seeing. Bright lights cause shadows that can create hazards rather than alleviating them. Brightly lighting an area also gives a false sense of security which leads people to walk where they might not otherwise go, such as too close to an edge, thinking they can see much better than they actually can. Lighting the pathway itself, and only the pathway, will help keep people from wandering off into more dangerous areas.

If safety is related to crime prevention, then once again too much light and glare creates places where people might feel much safer than they actually are. Shadows where criminals can hide become an issue. Bright lights also spotlight a possible target giving a criminal someone to interfere with and then

run off into the shadows. Cameras do nothing unless they are constantly monitored. Again, a false feeling of safety.

So much of the planet suffers from light pollution that most children have never seen the Milky Way. This has led to a tourism boom in night sky viewing. Rather than continuing to cater to a single element of the tourism industry it would benefit our community to reach out to this new tourist and turn off the marine lights, which are damaging, and encourage people to visit Yachats for the chance to enjoy the night sky.

section 9.42.050 B 1 Should we further justify, or change the higher lumen limits for Multi-family housing?

A separation of types of residential light, for the purpose of this ordinance, could be that single family residential and duplex developments (R-1, R-2 & R-3) meet the same requirements and multifamily (R-4) developments have a slightly higher lumen allowance because they will most likely share common walkways and areas.

section 9.42.060 Mary Ellen was concerned about liability issues. Perhaps we should expand on the variance section to say that if compliance producers a (such as cost), or a concern about liability for inadequate lighting, a property owner may apply…

This ordinance does not limit lighting to such an extent that liability issues would arise. Safety has been discussed throughout the development of this ordinance. In actuality there are times when too much light can be a liability as well. The safety of guests is the responsibility of the business. If a business believes that their customers require lighting to navigate their property, we certainly allow that; we simply have parameters around what those lights should be in order to avoid trespass, glare, and sky glow. Navigating pathways, parking lots and marine lighting are different kinds of illumination challenges with different kinds of needs, safety parameters and liabilities.

section 9.42.070 A 1 The requirement for compliance within 48 hours/30 days was suggested to be lengthened to 14 days/60 days because of the time required to order items on line.

That's fine. A *slight* extension seems reasonable**.**

Costs associated with compliance:

If the council believes that due to the pandemic our businesses need more time to comply with the ordinance, we would recommend extending the deadline and have the complaint mechanism be the way to reach compliance of existing lighting upon enacting the ordinance. If a resident or business receives a complaint regarding trespass lighting, glare or excessive sky glow and it is deemed an actionable complaint, then the lighting will need to be brought into compliance within the 60-day(?) period.

To Planning Commission for discussion – JGD Response to the Adobe letter:

Community input:

At the recent public meeting on the Lighting Ordinance there seemed to be many more people who wanted marine lighting regulated or disallowed. There have been letters as well. There has also been an overwhelmingly positive response to creating a lighting ordinance in general due to the interest in eliminating excess sky glow and allowing night sky viewing in general. One newly elected council member specified during the campaign wanting Yachats to adopt a dark sky ordinance which would definitely disallow the marine lighting currently in use.

Examples Ecological effects:

From: *APRIL 28, 2015*
Coastal light pollution disturbs marine animals, new study shows

by University of Exeter

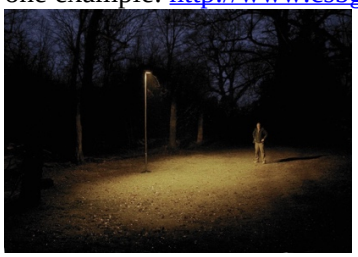
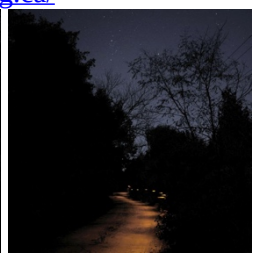
Dr Stuart Jenkins of the School of Ocean Sciences at Bangor University said: "This is an important first step in developing understanding of the way artificial light may be affecting marine coastal assemblages. Our research showed that levels of artificial light, commonly found in urbanized and developed coastal areas, can have important effects on the development of communities inhabiting hard surfaces in shallow water."

Dr Thomas Davies from the University of Exeter highlighted how historically overlooked the impacts of light pollution on coastal ecosystems has been, saying: "There has been a surge of research into the impacts of artificial lighting on land animals and plants over the last six years, but the influence on coastal animals of lights from harbors, marinas, piers and promenades has received very little attention. Understanding how to manage ecosystems to improve biodiversity gains is as important in the built marine environment as it is in our city parks, gardens, streets, rivers and canals. This study highlights that night-time lighting in coastal cities can impact biodiversity on rocky shores popular with beachgoers that enjoy the diversity of life they offer year round."

Safety along the 804 and pathways:

Just as was discussed with the Fireside and Overleaf, pathway lights would do a better job lighting the path for people walking without creating sky glow for the rest of the community. There is no need for flood lights. There are options available and there will be a year's time to switch them out.

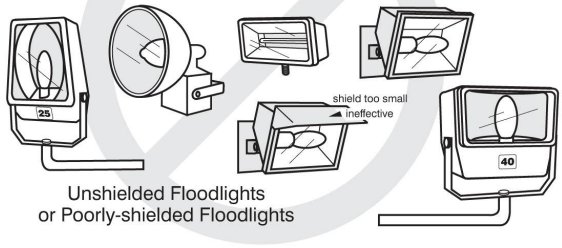
If it is decided that these properties are allowed to continue the lighting we should give specific types of lights to be used rather than simply allowing the continued use of existing flood lights. Here is a link for one example: http://www.csbg.ca/

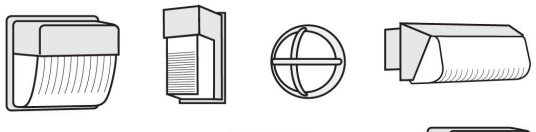
Examples of Acceptable / Unacceptable Lighting Fixtures

Unacceptable / Discouraged

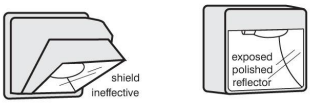
Fixtures that produce glare and light trespass

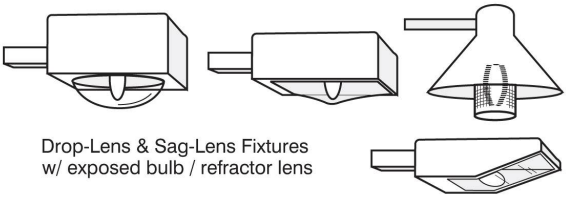


Unshielded Floodlights
or Poorly-shielded Floodlights

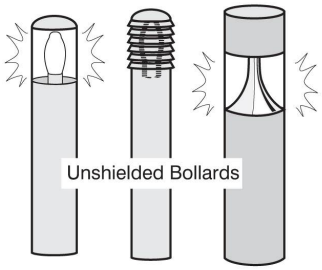


Unshielded Wallpacks
& Unshielded or
Poorly-shielded Wall
Mount Fixtures

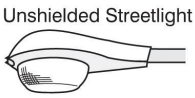




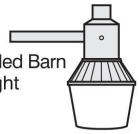
Drop-Lens & Sag-Lens Fixtures
w/ exposed bulb / refractor lens



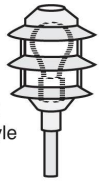
Unshielded Bollards



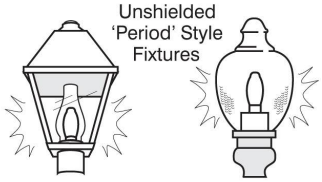
Unshielded Streetlight



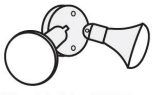
Unshielded Barn
Light



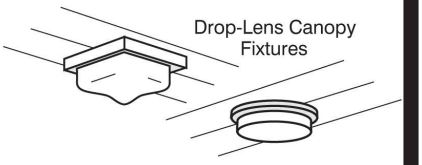
Louvered
'Marine' style
Fixtures



Unshielded
'Period' Style
Fixtures



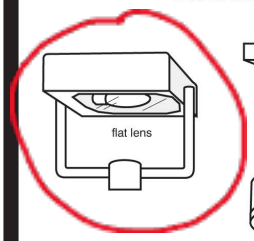
Unshielded PAR
Floodlights

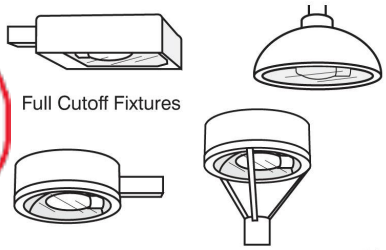


Drop-Lens Canopy
Fixtures

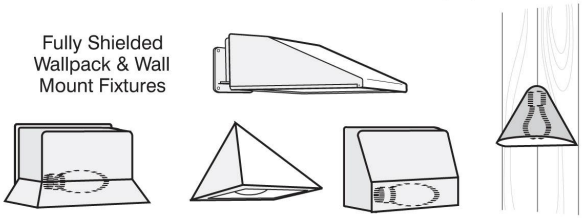
Acceptable

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

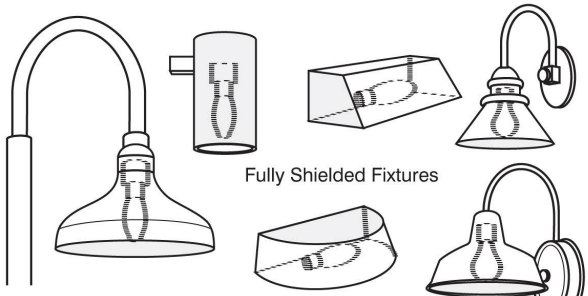




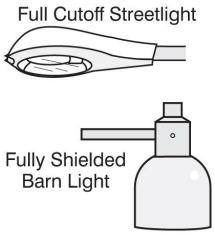
Full Cutoff Fixtures



Fully Shielded
Wallpack & Wall
Mount Fixtures

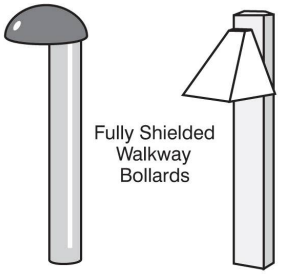


Fully Shielded Fixtures



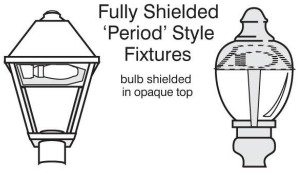
Full Cutoff Streetlight

Fully Shielded
Barn Light



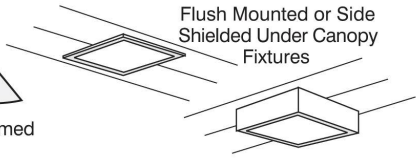
Fully Shielded
Walkway
Bollards

Fully Shielded
Decorative
Fixtures



Fully Shielded
'Period' Style
Fixtures

Shielded / Properly-aimed
PAR Floodlights



Flush Mounted or Side
Shielded Under Canopy
Fixtures

This from the Canadian Scotobiology (the study of darkness on biology) group:

On a Budget?
You do not have to spend a lot of money to reduce your impact on the night. Here are a few tips, and why they work.

Cover pathways with white crushed stone (limestone or dolomite)

We see the ground with the light it reflects. If you use asphalt, less than 10% of the light is reflected. If it's a dirt path, then the soil will reflect about 20% of the light - about the same as grass. But crushed stone reflects about 80%. So, you can use much less light for the same visibility. In addition to using less light, a stone surface is easily repaired, and rainwater will drain through rather than forming puddles.

White paint on woodwork.

There are a few critical features that we NEED to see: steps and handrails - so make them obvious. White paint reflects almost all the incident light. So paint the edges of the step and sides of the railing. They will be much more prominent with only a small flashlight. You can also paint the edges of stone steps. You will be able to notice them under starlight.

Retro-reflective materials

This is similar to the idea of white paint. We can mount retro reflective materials in isolated places: posts, trees, rocks, etc. to mark their location. They will appear to "glow" when illuminated by a small flashlight and will standout against the darker background.

Use "Bug Lights"

Bug Lights get their name because they don't attract flying insects as much as white light. You can get these in the form of incandescent, CFL or LED bulbs. They don't emit much blue light, which makes the light look amber. However the CFL and LED bulbs may be "too bright", so although the illuminated path won´t attract bugs, the brightness of the lamp will. To reduce this, the lamps should be shielded so the glare won't attract the insects. You may still be able to get some low wattage incandescent bulbs (<25W).

Filter the white light

White light is the mix of all colours, but the blue component is the "ecological disruptor". To make a white lamp acceptable, block the blue light with a filter. I show how well one filter works here. This Roscolux #15 Deep Straw filter can be purchased from BH Photovideo. I am sure there are others, but this is the one I found first.

Phosphorescent materials

These materials store up the light energy during the day and re-emit it at night. If the material is thick enough (5 mm) it may glow for the entire night. It has a slight greenish colour. This material is also used as escape lighting along the floor of aircraft, but it is quite thin and doesn´t glow for very long. I have seen these at the Mont-Megantic Observatory and AstroLab facility (Quebec). They are formed into small "pucks" about 4cm in diameter, and help delineate the roadway. They work very well but may be hard to find commercially.

Leave it dark

As strange as it may seem, it may be safer to leave an area dark. Light attracts attention and raises curiosity. If there is a place where you don't want people to go at night - keep it dark. Most animals know that anonymity is the best security.

Mark a spot?

What is it you would like to do? Marking a spot or location doesn't need a flood light. A VERY small low-power lamp will work. This will be enough for you to get your bearings. Consider the "morning", or "evening" star. It appears as a brilliant "spark" in the sky. It's actually the planet Venus, but my point is that it is VERY easy to see. Its "luminance" is 1 cd/m^2, which doesn't mean much for most people. But a single LED powered by only a few milliwatts will produce this light. You DON'T need a 10W commercial light fixture.

Illuminate an area

If you want to illuminate and area like a patio then you will need more light. A good way to select the right fixture is by using the power it consumes. A typical LED light fixture produces (very roughly) 100-lumens of light per watt. A CFL bulb produces about 80-lumens per watt. You need only 1-watt to illuminate a 10m^2 patio (~10-feet x 10-feet) to 10-lux with an LED. To put this into perspective, you can read at 2-3 lux. You DON'T need a 10W commercial light fixture unless you want your patio to be brighter than your living room, which will also attract all the bugs in the neighborhood.

Simply shield

If you do not want to buy an expensive lamp with a good shield, you can make your own for your current light. If you have a low power (<15W) LED or CFL bulb, you can even use cardboard. If you have an incandescent bulb then you should use metal, because most of the power goes into producing heat, which can char or burn a cardboard shield. Here and here are links to a couple of examples. I paint the cardboard and metal shields with white outdoor metal paint. It will protect the material for many years. These are also nice craft projects for your children and grandchildren, and will get them thinking about the environment and how to protect it.

LOREN

1. To possibly contact the hotels and see if a lighting curfew would be acceptable if the City were to give them some relief for time-to-comply, as you were suggesting. This could help start the negotiation process. If they say "no", then a completely different approach to the ordinance would be required.

2. A legal question: can the ordinance discriminate between residential properties and commercial (hotels) for conditions and times-to-comply as far as marine lighting is concerned? I believe there is such a distinction between the two that, if possible, each should have a regulation that better fits its conditions.

3. I am very concerned about the Adobe's threat to close off 804 access. This would be a catastrophe for the continuity of the Pacific Coast Trail, and the safety & convenience of those trying to walk the length of the 804. Walkers would have to detour all the way up to Hwy 101, and walk along that very dangerous situation to Aqua Vista Lp. If it could be found through further discussion with the Adobe as to how certain that threat is, it might be helpful.

LANCE

Code conflicts/concerns for Marine Lighting

1. Trespass Lighting 9.42.040B
2. Marine Lighting (damage to wildlife) 9.42.040 D
3. Lights above the eaves 9.42.040G
4. Nuisance lighting 5.08.165A

Because of conflicts with all of these ordinances Marine Lighting cannot be ignored in a lighting ordinance.

Discussed Solutions

1. Ban on new Marine Lighting.
2. Removal of installed Marine Lighting
   a. in 1 year?
   b. in 3 years?
   c. in 5 years?
   d. When repair/replacement is needed
3. Curfew
   a. summer 11pm?
   b. winter 9pm or 10 pm?
   c. 10pm year around?
4. Modification to lights
   a. replace with "non-blue lighting" to offer a softer yellow light
   b. reduce lighting intensity (how much?)
   c. change direction of lighting to nor shine on marine life or neighbors property
5. Negotiations between City officials and Lodging representatives.
6. Combinations of any/all of the above.

HELEN

Marine Lighting definition adjusted to specify illumination of area beyond property line. This distinction circumvents any concerns around whether lighting is primarily security lighting or marine lighting.

OREGON CASCADES WEST Council of Governments

1400 Queen Ave SE • Suite 201 • Albany, OR 97322
(541) 967-8720 • FAX (541) 967-6123

MEMORANDUM

DATE: October 20, 2020

TO: Planning Commission, City of Yachats

FROM: Holly Hamilton, Contract Planner
OCWCOG

RE: **Hazard Mitigation and Lighting Ordinance**
Proposed Comprehensive Plan Goals and Policies
Proposed Development Code Amendments

---

1. **Issue/Question:** Does the **Municipal Code** address lighting within the City of Yachats in a manner which supports the goals of the Comprehensive Plan?

   Explanation: The Municipal Code currently addresses lighting minimally and without specificity; restricting exterior lighting directed to adjacent property (broadly defined by use).

   > See **Section 5.08.165 Exterior lighting.**
   > A. Exterior lighting shall not be directed from the property of the owner onto private residential or commercial property, streets, parklands, or other public properties.

   The City of Yachats **Comprehensive Plan GOAL D** *Conservation of Energy* and **GOAL G** *Control of Urban Growth and Form to sustain the small-town, ocean-side character of the Yachats Community* supporst the addition of a comprehensive lighting strategy which requires energy efficient lighting standards and addresses the adverse effects of bright, outdoor lighting, light trespass and glare.

   The Planning Commission initiated textual changes to YMC Title 9.0, Lighting Standards and Requirements, 9.42 as follows:

   Code:

   PART I
   9.04.030 Definitions (Municipal Code)

   PART II
   9.42.010 Purpose
   9.42.020 Definitions
   9.42.030 General Lighting Requirements
   9.42.040 General Standards
   9.42.050 Standards Based on Use
   9.42.060 Variances
   9.42.070 Time to Become Compliant
   9.42.080 Examples

The development of a comprehensive lighting ordinance pre-dates my arrival to the Planning Desk for the City of Yachats. Municipal lighting code research began in 2017 and has been reviewed through planning commission meetings and work sessions conducted during the last two years.

Comments from the community over the last two weeks have been largely positive, and those that contain questions for the Commissioners follow this report.

2. **Issue/Question:** Is the Yachats Comprehensive Plan and Municipal Code aligned with the Goals of the State to incorporate highest / best strategies for Hazard Mitigation?

Explanation:
The City of Yachats received a Coastal Resilience Grant from the Oregon Coastal Management Program for March through July 2020. The goal of the grant was to utilize best available data and resources to review and update portions of the **Yachats City Comprehensive Plan and Municipal Code.**

The resulting review effected new language / process for the protection of Yachat's natural resources.

Goal A:	Protection of Natural Resources (General)
Goal B:	Protection of Estuarine Resources
Goal C:	Protection of Shoreland Resources
Goal E:	Protection from Natural Hazards and Disasters, and
Goal L:	Beaches

and related **Municipal Codes**:

Sections	9.04.030	(Definitions)
	9.52.050	(Hazard Areas)
	9.52.100	(Older Stabilized dune construction)
	9.52.130	(Development on Beaches).

The City of Yachats held several work sessions including a City Council and Planning Commission joint work session on June 4th, a Planning Commission work session on July 7th, and a Planning Commission work session on July 21st.

Comments Summary:

Mr. Ellington and Ms. Van Wagtendonk
- Recommended - Reference to 5.08.165
- Requested clarification on compliance (fixture vs. bulb)

Ms. Erdhal
- Supporting the Ordinance generally

Mr. Brown
- Requested additional information, and I provided a link to the city's website

Ms. Macdonell
- Resides adjacent to the Dublin Motel – which has 4 very bright lights on their west elevation affecting approximately 10 homes. She is requesting that the motel address this issue.

Mr. Kent Naffziger
- Expressed general support for shielding
- Concern regarding brightness of LED lights

Mr. and Mrs. Nolans
- North Yachats
- Noted brightness of new streetlights
- Supports shielding of light fixtures
- Expressed concern with regard to the Adobe Motel Lighting and how it may affect marine life

Mr. Kemp
- Expressed concern about maximum allowable lumens per residence (for large residences)
- Clarification regarding applicability of variance applications vs. grandfathered in fixtures

November 10, 2020

To: **Shannon Beaucaire, City Manager**

From: **Justin Peterson, Contract City Planner**

Re: **Draft Amendments Lighting**

At the October 20, 2020 Planning Commission meeting the decision was made to continue the hearing to October 28, 2020. At the October 28, 2020 continued Planning Commission meeting, the Commission passed a motion to forward the attached recommended amendment to Yachats Municipal Code to City Council. The Planning Commission identified several changes that are noted in this memo to the lighting ordinance.

Issue/Question: Does the Municipal Code address lighting within the City of Yachats in a manner which supports the goals of the Comprehensive Plan?

Explanation: The Municipal Code currently addresses lighting minimally and without specificity; restricting exterior lighting directed to adjacent property (broadly defined by use).

> **See Section 5.08.165 Exterior lighting.**
> A. Exterior lighting shall not be directed from the property of the owner onto private residential or commercial property, streets, parklands, or other public properties.

The City of Yachats Comprehensive Plan GOAL D Conservation of Energy and GOAL G Control of Urban Growth and Form to sustain the small - town, ocean - side character of the Yachats Community supporst the addition of a comprehensive lighting strategy which requires energy efficient lighting standards and addresses the adverse effects of bright, outdoor lighting, light trespass and glare.

The Planning Commission initiated textual changes to YMC Title 9, Lighting Standards and Requirements, 9.42 as follows:

At the October 20, 2020 Planning Commission meeting several comments were provided by members of the public. The October 20, 2020 public hearing was continued to October 28, 2020.

The Planning Commission member amendments are listed below:

1. 9.04.030 Definitions

Foot-candle: A measure of luminance or a measure of how bright a light appears to the eye. One foot-candle is equal to one lumen per square foot. As an example, a ~~typical~~ 60-watt <u>incandescent</u>

light (800 lumens) produces an illuminance of one-tenth (0.1) foot candle at a distance of about twenty-five (25) feet.

2. 9.04.030

Individual Lot Limit: The maximum for the sum of all exterior individual light sources on a given property as enumerated in 9.42.050.A and 9.42.050.C.

3. 9.04.030 Definitions

Exterior Lighting: Lighting relating to the outside of a building or structure.

4. 9.42.040.E

Mercury vapor lamps, metal halide lamps, and low-pressure sodium lamps are prohibited.

5. 9.42.050.B.4 and 9.42.050.C.6 – change to read

Poles for luminaires shall be limited to:

a. Sixteen (16) feet in height for parking lots.
b. Ten (10) feet in height for walkways and pedestrian facilities.

6. 9.42.050.C.1 Distinguish residences in Commercial Zone

Commercial lots, when developed for commercial uses, shall not exceed limits on trespass lighting as specified in 9.42.040.B.

7. 9.42.050.C.5

High intensity lights shall be limited to two thousand four hundred (2,400) lumens per luminaire. Due to their high energy efficiency, long life, and spectral characteristics, narrow spectrum amber LED's are the preferred illumination source.

8. 9.42.070.A

A. The General Standards described in 9.42.030 and 9.42.040 require compliance within one year after the passage of this Ordinance.

1. When violations of 9.42.040 are cited by the enforcement officer and if the violation can be corrected by replacing an existing bulb with a lower intensity bulb, this corrective action is required to be implemented within forty-eight (48) hours after the citation. Other corrective actions are required to be implemented within thirty (30) days after the citation.

2. Marine lighting existing previous to the enactment of this ordinance must be:

a. Turned off no later than 10:00 pm each night and
b. Removed within one year of the enactment of this ordinance.

9. 9.42.050.B.1

Individual lamps on multi-family properties are limited an output of one thousand two hundred (1,200) lumens each, except for parking areas which may be two thousand (2,000) lumens each.

Council Action:

1. The City Council may approve,
2. Deny or
3. Remand back to the Planning Commission for reconsideration the proposed amendment

Example Motion:

To approve the proposed amendment to the Yachats Municipal Code based on the testimony received, the findings within the staff report, and the evidence and arguments before the City Council at the public hearing on November 17, 2020. The City Council determines that the request by the City of Yachats to add Section §9.42.050 and amend Section §9.04.030, of the Yachats Municipal Code. The City Council hereby adopts the staff memo as findings and the other evidence in the record as findings supporting its decision and approves the Ordinance.

Attachments:

1. Proposed changes from the October 28, 2020 PC Public Hearing
2. Proposed Ordinance prior to the Public Hearing
3. Draft Ordinance
4. Public Comments

February 2, 2021

To: **Planning Commission**

From: **Justin Peterson, Contract City Planner**

Re: **Draft Amendments Lighting**

After the City Council meeting Planning Commission members submitted some comments about the Lighting Ordinance. The comments are included in the packet. The following bullets expand on some of the comments and answer some of Planning Commission member questions.

- The highlighted comments sections are not proposed to be removed unless in strikethrough. "or equal to" (YMC 9.42.050(A)(2)(b)) is not proposed to be removed.
- The code is proposed to be updated from three or more residential units to multi-family. Multi-family is defined in the Yachats Code. "Dwelling, Multifamily. "Multifamily dwelling" means a building containing three (3) or more dwelling units."
- YMC 9.42.050(C)(1) was updated to say "commercial uses" this is consistent with the single-family or two-family residential uses and multi-family residential uses. Planning Commission can choose not to make the change.
- The parking spaces standard in YMC 9.42.070(B)(2) was shown in strikethrough in the draft sent to City Council. The attorney commented that the three different measures of 25% seemed awkward. Planning Commission could choose to keep parking spaces.
- The images require copyright permission. Giving credit is not the same as permission. Figure 3 is an image of glare from car lights. Are car lights regulated by this ordinance?
- The variance criteria are listed in YMC 9.80. The criteria for a variance requires that the variance be necessary as a result of a physical aspect of the lot. The attorney could not think of an example where someone could meet the criteria on his initial review.

The paragraphs and information below is mostly copied from the January 20, 2021 City Council memo. The Planning Commission may discuss the items below.

Upon further review the Lighting Ordinance and consultation with the City Attorney Staff believes there are areas where the record can be improved to support the proposed language and policy choices. The goal is to strengthen the record so Planning Commission and City Council can make a decision based on the facts in the record.

Here some questions that City Council and Planning Commission may consider:

- How much do marine lights cost? The amount of time you give a business or property owner to replace equipment should have some relationship to the expense of the equipment. The more expensive the equipment the more time the City would want to allow for compliance.
- Planning Commission was interested in a separate compliance timeline for residential vs commercial uses. What is the difference between a residential marine light vs. a commercial marine light? If they are the same fixture then there is not much reason to treat them differently.
- As to the curfew, is there evidence in the record as to why light after 11PM is harmful, as compared to light before 11PM? During the winter, that would allow the lights to be on for at least five hours; during the summer, only a couple hours. The record should have information about why 11PM is important for this type of lighting and the harm it causes.

Other comments included:

- A need to clarify the meaning of "bright" in the Marine lighting definition.
- A need to better define temporary.
- A question about official copyright permission for the images.
- Instead of stating "after the passage of this ordinance" defining a specific date.
- A need for an administrative process to review rather than the standard variance process. It is unclear how a lighting regulation could meet the variance requirements.
- YMC 9.42.070(2)(c) is not a regulation. As such, it does not belong in the Code.
- YMC 9.42.050(E) should be removed since it is not a regulation.

Last comments from the City Attorney included minor text edits, formatting edits, and updating terms formatting to match existing formatting in YMC 9.04. The attached Ordinance has track changes identifying suggested text edits.

Public Hearing History: At the October 20, 2020 Planning Commission meeting the decision was made to continue the hearing to October 28, 2020. At the October 28, 2020 continued Planning Commission meeting, the Commission passed a motion to forward the attached recommended amendment to Yachats Municipal Code to City Council. The Planning Commission identified several changes that are noted in the memo dated November 10, 2020 to the lighting ordinance. The City Council remanded the draft Ordinance back to the Planning Commission at the November 18, 2020 meeting. Planning Commission discussed the Ordinance at the December 1, 2020 Planning Commission meeting. Planning Commission voted to recommend approval and forward the Ordinance to City Council at the December 21, 2020

meeting. City Council remanded the Ordinance back to Planning Commission at the January 20, 2021 meeting.

Issue/Question: Does the Municipal Code address lighting within the City of Yachats in a manner which supports the goals of the Comprehensive Plan?

Explanation: The Municipal Code currently addresses lighting minimally and without specificity; restricting exterior lighting directed to adjacent property (broadly defined by use).

> **See Section 5.08.165 Exterior lighting.**
> A. Exterior lighting shall not be directed from the property of the owner onto private residential or commercial property, streets, parklands, or other public properties.

The City of Yachats Comprehensive Plan GOAL D Conservation of Energy and GOAL G Control of Urban Growth and Form to sustain the small - town, ocean - side character of the Yachats Community supports the addition of a comprehensive lighting strategy which requires energy efficient lighting standards and addresses the adverse effects of bright, outdoor lighting, light trespass and glare.

Staff received additional written comment/question from Mary Coolidge on January 21, 2021 after the January 20, 2021 City Council Meeting. The comment is added to the packet.

Planning Commission Action:

1. The Planning Commission may recommend approval,
2. Recommend approval with modifications
3. Deny or
4. Continue the Public Hearing to another date and time.

Example Motion:

To recommend approval of the proposed amendment to the Yachats Municipal Code based on the testimony received, the findings within the staff report, and the evidence and arguments before the Planning Commission at the public hearings. The Planning Commission determines that the request by the City of Yachats to add Section §9.42.050 and amend Section §9.04.030, of the Yachats Municipal Code. The Planning Commission hereby adopts the staff memo as findings and the other evidence in the record as findings supporting its decision and recommends approval of the Ordinance.

Attachments:

1. Draft Ordinance with Track Changes
2. Draft Ordinance before Track Changes with recent changes highlighted.
3. Public Comments
4. Planning Commission Members Comments and Research
5. Staff memos from earlier public meetings (October 20, 2020, November 10, 2020, and the January 20, 2021)