

# **SAMPLE LIGHTING MANAGEMENT PLAN FOR INTERNATIONAL DARK SKY PARKS/RESERVES/SANCTUARIES**

*This document is provided by IDA for the purpose of creating a plan for appropriately lighting parks and similar protected areas, and makes use of conservation best practices developed in the International Dark Sky Places Program. Any plan containing the minimum provisions of this document is consistent with program requirements for International Dark Sky Parks, Reserves and Sanctuaries.*

## **1. Purpose and Philosophy**

This Lighting Management Plan (LMP) is intended to guide the selection, placement, installation and operation of all new and replacement/retrofitted light in the park. Its function is to regulate the use of artificial light at night (ALAN) in the park in a way that prioritizes the safety of visitors and staff while minimizing the impact of such light on protected outdoor spaces, viewsheds and wildlife. Therefore, all instances of the use of ALAN in the park will adhere to the principle that outdoor light should be deployed only: (1) when it is strictly needed; (2) where it is needed; (3) in the appropriate amount for a specific task; and (4) with the appropriate spectrum.

## **2. Applicability**

The park represents that this LMP meets or exceeds all applicable agency and/or departmental policies regarding outdoor lighting and conforms to all local, regional, and national laws.

*[State the relevant laws/policies/regulations here. Look toward local jurisdictions: area municipalities, states and/or provinces.]*

## **3. Exemptions**

The following types of outdoor lighting installations shall be permitted in the park and are not subject to the other regulations of this LMP:

1. Lighting installations required by the relevant local, regional or national legal jurisdiction.
2. Lighting installations required temporarily for the safe performance of nighttime tasks, such as construction, at the discretion of the park manager/superintendent. (See “Temporary Lighting,” below)
3. Outdoor lighting controlled with motion-activated switches limiting the duration of illumination to less than five (5) minutes after activation.

4. Unshielded, low-intensity ‘holiday’ lighting<sup>1</sup> whose use is specific to events or time periods as prescribed by the park manager/superintendent

*[Add any other desired exemptions here that are otherwise not inconsistent with the other provisions of this LMP.]*

#### **4. Warranting of outdoor lighting installations**

The installation of new outdoor lighting in the park is permitted only in instances where the park manager/superintendent determines that a public safety hazard exists that can only be mitigated through the use of outdoor light at night. Where light at night is required for the safe performance of tasks or safe transit between locations, it will be used; otherwise, the default policy of the park is to **not** light.

#### **5. Shielding**

All outdoor lighting fixtures whose lamps have an intensity of equal to or greater than 500 initial lamp lumens<sup>2</sup> shall be fully shielded. Lighting whose lamps have an intensity of less than 500 initial lamp lumens may be left unshielded for special purposes, such as historical preservation, upon determination by the park manager or superintendent. These lights shall not be exempt from the other requirements of the LMP, and must be designed in such a way to minimize impact to the nighttime environment.

Further, to the greatest possible extent, the park will endeavor to limit the inadvertent or incidental emission of light from indoor spaces to the outdoors through the use of window coverings, indoor lighting timers/switches, and other appropriate measures.

#### **6. Spectrum**

Outdoor lighting fixtures in the park shall be chosen to minimize the amount of short-wavelength light<sup>3</sup> emitted into the nighttime environment. The park will prefer amber and similar colors for lighting, and avoid white light wherever practically possible unless a demonstrated need for color rendition exists. In no case shall the correlated color temperature of any lamp exceed 3000 Kelvins.

*[Or: “Only lamps emitting no more than 25% of their total spectral power at wavelengths less than 500 nanometers shall be allowed in the park.”]*

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<sup>1</sup> Optionally, define a period of time (range of calendar dates) during which such displays are allowed.

<sup>2</sup> IDA encourages (but does not require) parks to require full shielding of all lighting, regardless of the number of lumens.

<sup>3</sup> “Short wavelength” is generally regarded as blue and violet light whose wavelengths are below 500 nanometers.

[Or: “The scotopic-to-photopic (S/P) ratio<sup>4</sup> of allowed lighting shall not exceed 1.3.”]

## 7. Lamp selection and illuminance values

In all applications, outdoor lighting deployed throughout the park will use the most energy-efficient lamp technology that minimizes the emission of short-wavelength light into the nighttime environment.

The following table gives the maximum illuminances that will be used throughout the park unless a demonstrated need for larger values exists.

<b>Application</b>	<b>Illuminance (lux)</b>	<b>Illuminance (footcandles)</b>	<b>Note</b>
Building entry	0.5	0.05	
Trailheads	0.3	0.03	1
Parking lot	10 / 1	1 / 0.1	2
Restroom entry	0.5	0.05	3
Entrance station	10 / 1	1 / 0.1	2, 4
Roadway	0	0	5
Signage	0.5	0.05	6
Flag	0	0	7

Table notes:

1. Trails should not be lit. Visitors are expected to provide their own flashlights/headlights for nighttime transit on foot or bicycle.
2. Values are quoted for amber light / white light, respectively.
3. Hazards at/near should be clearly marked to ease the transition from a brightly-lit interior environment to a darker exterior environment.
4. The lighted area should be restricted to the interface between incoming vehicles and park staff.
5. Roadway lighting in parks should be restricted only to ‘conflict zones’ (typically, intersections or at the interface between motor vehicles and bicyclists/pedestrians), and appropriate to the nature of the hazard.
6. Signs should be made of high-reflectivity materials, and generally only lit in areas where they are not intended to be seen by passing motorists.
7. Flags should be lowered at sunset and not flown overnight.

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<sup>4</sup> For more information on the S/P ratio, see <http://agi32.com/blog/tag/sp-ratio/>.

## 8. Illuminated Signs

Internally-illuminated signs<sup>5</sup>, and signs illuminated by electronic means such as LEDs and similar lighting<sup>6</sup>, are prohibited in the park.

[Or: *"Internally-illuminated signs, and signs illuminated by electronic means such as LEDs and similar lighting, shall be installed and operated according to the following requirements:*

*1. Use of such signs from one hour after local sunset to one hour before local sunrise is prohibited. Such signs will be equipped such that they are extinguished automatically at these times.*

*2. Displays must be single-color on a black background<sup>7</sup> in design.*

*3. Illuminance of such signs after sunset may not exceed 100 nits (100 candelas per square meter)."]*

## 9. Curfew

Dusk-to-dawn lighting is not generally allowed in the park. All outdoor lighting will be extinguished between the hours of 10 PM<sup>8</sup> and one hour before sunrise, except in cases where visitor or staff presence or traffic dictates otherwise.

## 10. Adaptive Controls

To the greatest practical extent possible, all park lighting will make appropriate use of adaptive controls to limit the duration, intensity, and/or extent of outdoor lighting.

## 11. Temporary Lighting

Allowable installations of outdoor lighting in the park for temporary purposes, as exempted above, shall be limited to the minimum number of nights required to complete the task that the lighting illuminates. Staff responsible for such installations will follow these guidelines to the greatest practical extent, and will endeavor to limit as much as possible off-site impacts of such lighting.

## 12. Visitor Lighting

Lighting of vehicle exteriors, tents, and other personal property belonging to park visitors of shall be limited by the park in such a way as to provide for reasonable use while maintaining the

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<sup>5</sup> Also known as "cabinet signs."

<sup>6</sup> Also known as "Electronic Message Centers" (EMCs).

<sup>7</sup> Also known as "reverse pan channel."

<sup>8</sup> Or, suggest some other reasonable hour here. At higher latitudes, this time may need to be adjusted seasonally to accommodate changing relative lengths of day and night.

natural character of the park and avoiding the creation of nuisance for other visitors. All lighting shall be restricted in intensity and extent to provide for the legitimate needs of visitors at their campsites, and shall be extinguished no later than the general park curfew hour. Inappropriate, high-intensity light painting of park landscapes, the use of searchlights, and similar uses of outdoor lighting by visitors is prohibited.

### **13. Definitions**

*Adaptive controls:* Any device that, when used in conjunction with outdoor lighting, limits the duration, intensity or area illuminated by the lighting. Examples include automatic switches, timers, and motion sensors.

*Correlated color temperature:* A metric characterizing the color properties (spectrum) of lighting, specified in units of Kelvins.

*Initial lamp lumens:* The number of lumens of light emitted by a lamp when new, not accounting for depreciation due to age. Initial lamp lumens are specified by manufacturers on product packaging or in data sheets.

*Light painting:* The use of portable lighting directed at landscape features for illumination during long-exposure landscape photography.