

III. Lighting Management Plan (LMP)

Given the scope and plurality of the proposed Reserve, the multitude of public and private lands, a stated commitment to this LMP and governance under existing county and municipal outdoor lighting ordinances (OLOs) serve to prescribe the proper use of light at night. Each of these ordinances have been updated to meet and often exceed the provisions of this LMP. As a rule, lighting is to be used when it is strictly needed, where it is needed, and in the appropriate amount for a specific task.

A. Applicability

1. Core Areas

a. Big Bend National Park (BBNP)

BBNP is designated by the IDA as an International Dark Sky Park and is committed to the provisions of the LMP for the proposed Reserve and the Brewster County OLO. Additional information is provided to visitors regarding proper outdoor lighting practices.

b. Big Bend Ranch State Park (BBRSP)

BBRSP is designated by the IDA as an International Dark Sky Park and is committed to the provisions of the LMP for the proposed Reserve and the Presidio and Brewster County OLOs. Additional information is provided to visitors regarding proper outdoor lighting practices.

c. The Nature Conservancy Davis Mountain Preserve (DMP)

The DMP is committed to the provisions of the LMP of the proposed Reserve and the Jeff Davis County OLO. Additional information is provided to visitors regarding proper outdoor lighting practices.

d. McDonald Observatory

A satellite campus of the University of Texas at Austin, McDonald Observatory is an astronomical research facility and is committed to the provisions of the LMP of the proposed Reserve and the Jeff Davis County OLO. Additional information is provided to visitors, staff, and residents regarding proper outdoor lighting practices.

2. Peripheral Areas

a. United States

All peripheral areas of the proposed Reserve north of the Rio Grande River are committed to provisions of the LMP as they are subject to local county and municipal outdoor lighting ordinances.

b. Mexico

The Protected Areas in northern Mexico and Ciudad Ojinaga have committed to work toward compliance with the LMP.

B. Compliance

The degree to which the core and peripheral areas currently comply and plan to comply with the LMP is defined in Sections IV and V: Lighting Inventories and Letters of Support. The core areas each have additional restrictions governing the use of artificial light at night by visitors.

C. Provisions

Many of the LMP provisions for the proposed Reserve are cited from local county and municipal outdoor lighting ordinances. Each of these ordinances have been updated to meet and often exceed provisions of the LMP.

1. Fully Shielded

All outdoor light sources shall be installed such that all of the light emitted from the light fixture is projected below the horizontal plane passing through the lowest light-emitting part of the fixture. The only exceptions are for light sources of 500 lumens or less such as holiday and bistro lighting.

2. Correlated Color Temperature (CCT)

The CCT of outdoor luminaires shall not exceed 2700 Kelvins.

3. Light Trespass

Outdoor light fixtures shall be shielded and aimed as necessary to prevent the light source from being visible from offsite or off property.

4. Lumens per Net Acre Cap

No more outdoor lighting is to be used than is necessary for the task at hand as defined by the Illuminating Engineering Society.

The Lumens per Net Acre Cap prescribed by ordinance:

| Governing Body | Residential Development | Nonresidential Development |
|-------------------|----------------------------|-------------------------------|
| Jeff Davis County | 25,000 | 50,000 |
| Brewster County | 25,000 | 50,000 |
| Presidio County | 25,000 | 50,000 |
| Reeves County | 50,000 | 100,000 |
| City of Valentine | 50,000 | 100,000 |
| City of Alpine | 25,000 | 50,000 |
| City of Marfa | 25,000 | 50,000 |
| City of Balmorhea | 25,000 | 50,000 |
| City of Presidio | 25,000 | 50,000 |

5. Outdoor Sports Facilities

- a. Lighting at public and private outdoor sports facilities, including but not limited to playing fields, arenas, tracks, and swimming pools, will be shielded to the greatest practical extent to reduce glare, safety hazards, light trespass, and light pollution.
- b. Lighting will provide levels of illuminance that are adjustable according to task, allowing for illuminating levels not to exceed nationally recognized Illuminating Engineering Society standards according to the appropriate class of play, as well as for lower output during other times, such as when field maintenance is being actively performed.
- c. Lighting shall be provided exclusively for illumination of the surface of play and adjacent viewing stands, and not for any other application, such as lighting a parking lot.
- d. Lighting must be extinguished by 11:00 p.m. or within one (1) hour of the end of active play. The outdoor sports facility lighting shall be fitted with mechanical or electronic timers to prevent lights from being left on accidentally overnight.

6. Sign illumination

- a. All permanent signs may be non-illuminated, illuminated by internal, internal indirect (halo), or lit by external indirect illumination. All illuminated signs shall be extinguished at 11:00 p.m. or within one (1) hour of the end of normal business hours, whichever occurs later. All sign illumination must comply with the correlated color temperature (CCT) requirements (see #2, above).
- b. Externally illuminated signs shall be lit only from the top of the sign, with fully shielded luminaires designed and installed to prevent light from spilling beyond the physical edges of the sign.
- c. Outdoor internally illuminated signs (whether free standing or building mounted) shall be subject to all the following requirements:
 - (1) The sign must be constructed with an opaque background and translucent letters and symbols or with a colored background and lighter letters and symbols.

- (2) The internally illuminated portion of the sign cannot be white, cream, off-white, light tan, yellow or any light color unless it is part of a registered logo that does not have an alternate version with dark tones. Light tone colors such as white, cream, off-white, light tan, yellow or any light color are permitted in the logo only, provided that such colors in the logo shall represent not more than 33% of the total sign area permitted.
 - (3) The internal illumination, between sunset and sunrise, is to be the lowest intensity needed to allow the sign to be visible for up to 1/2 mile from its installation and shall not exceed 100 nits.
 - (3) The luminous surface area of an individual sign shall not exceed 200 square feet (18.6 square meters).
- d. Electronic message displays are discouraged and shall comply with outdoor lighting curfews. Messages appearing on electronic displays shall not be displayed for less than (30) seconds and shall require no longer than 0.25 seconds to transition from one message to another. Moving and/or flashing text or images are prohibited.
- (1) Operation is prohibited from one hour after local sunset to one hour before local sunrise (unless strictly required for wayfinding or identification of businesses during normal business hours).
 - (2) Displays must be single-color on a black background.
 - (3) Luminance must not exceed 100 nits (100 candela per square meter).
 - (4) The luminous/illuminated surface area of an individual sign must not exceed 200 square feet (18.6 square meters).

7. Adaptive Controls

The use adaptive controls such as half-night photo cells, timers, and motion sensors is encouraged so that light fixtures are not on when no one is there to use them.

8. Exemptions

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

- a. Lighting installations required by the relevant local, regional or national legal jurisdiction.
- b. Lighting installations required temporarily for the safe performance of nighttime tasks, such as construction, at the discretion of the core area manager/superintendent (see #9, below).
- c. Outdoor lighting controlled with motion-activated switches limiting the duration of illumination to less than five (5) minutes after activation.

9. Temporary Lighting

Allowable installations of outdoor lighting in the core areas for temporary purposes 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.

10. Sunset

All outdoor lighting in the core areas of the proposed Reserve shall be 90% compliant within five (5) years and 100% compliant within 10 years. The peripheral areas in the United States are subject to county and municipal OLOs each of which requires all outdoor lighting be brought into compliance within five (5) years of the adoption of the ordinance.