

Greater Big Bend International Dark Sky Reserve

White Paper

July 1, 2020

I. Introduction

McDonald Observatory is applying to the International Dark-Sky Association (IDA) to establish an International Dark Sky Reserve (DSR) in the Big Bend region of far West Texas and Northern Mexico. Such certification will help raise awareness of the value of protecting the night skies for ongoing astronomical research at the Observatory and encourage communities in the area to adopt night sky friendly outdoor lighting practices. Such practices create a safer and more attractive nighttime environment, promoting eco- and astro-tourism in the region. Also, mitigating the amount of artificial light shining wasted into the night sky helps protect major wildlife habitats and migration corridors throughout the Big Bend.

II. McDonald Observatory

McDonald Observatory is a 500-acre satellite campus of the University of Texas at Austin, located in the heart of the Davis Mountains in far West Texas. This world-class astronomical research facility is home to some of the world's largest telescopes and darkest night skies. The Observatory maintains a robust public outreach program, including guided tours of its research facilities, evening Star Parties three times a week, accredited teacher workshops, and live-streaming telescopic tours of the night sky, the Moon, and the Sun.

III. Greater Big Bend International Dark Sky Reserve

An IDA International Dark Sky Reserve is a public or private land possessing an exceptional or distinguished quality of starry nights and nocturnal environment that is specifically protected for its scientific, natural, educational, cultural, heritage and/or public enjoyment. Reserves consist of a core area meeting minimum criteria for sky quality and natural darkness, and a peripheral area that supports dark sky preservation in the core. Reserves are formed through a partnership of multiple land managers who recognize the value of the natural nighttime environment by adopting a common Lighting Management Plan (LMP).

Three Texas counties will make up a large part of the DSR: Jeff Davis, Brewster, and Presidio (see map below). Jeff Davis County is home to McDonald Observatory, Fort Davis National Historic Site, Davis Mountain State Park, Chihuahuan Desert Research Institute, and Davis Mountain Preserve-The Nature Conservancy. Brewster County is home to Big Bend National Park and Black Gap and Elephant Mountain Wildlife Management Areas. Presidio County is home to Big Bend Ranch State Park and Chinati Mountains State Natural Area.

Support of these public lands is crucial for a successful application. Big Bend National Park and Big Bend Ranch State Park, located along the north bank of the Rio Grande

River, already enjoy IDA certification as International Dark Sky Parks, will help comprise the core area of the DSR.

There are also protected lands bordering the United States along south bank of the river in Mexican states of Chihuahua and Coahuila administered by La Comisión Nacional de Áreas Naturales Protegidas. These include Monumento Río Bravo del Norte, Maderas del Carmen, Ocampo, and the Cañón de Santa Elena, which, together with the three Texas counties, will help comprise the peripheral area of the DSR. (Visit the International Dark-Sky Association's Dark Sky Places <<https://www.darksky.org/our-work/conservation/idsp/>> site for application criteria and guidelines). Note the Greater Big Bend International Dark Sky Reserve, if so certified, will be far greater in size than the other 16 Dark Sky Reserves in the world combined.

IV. Night Sky Friendly Outdoor Lighting

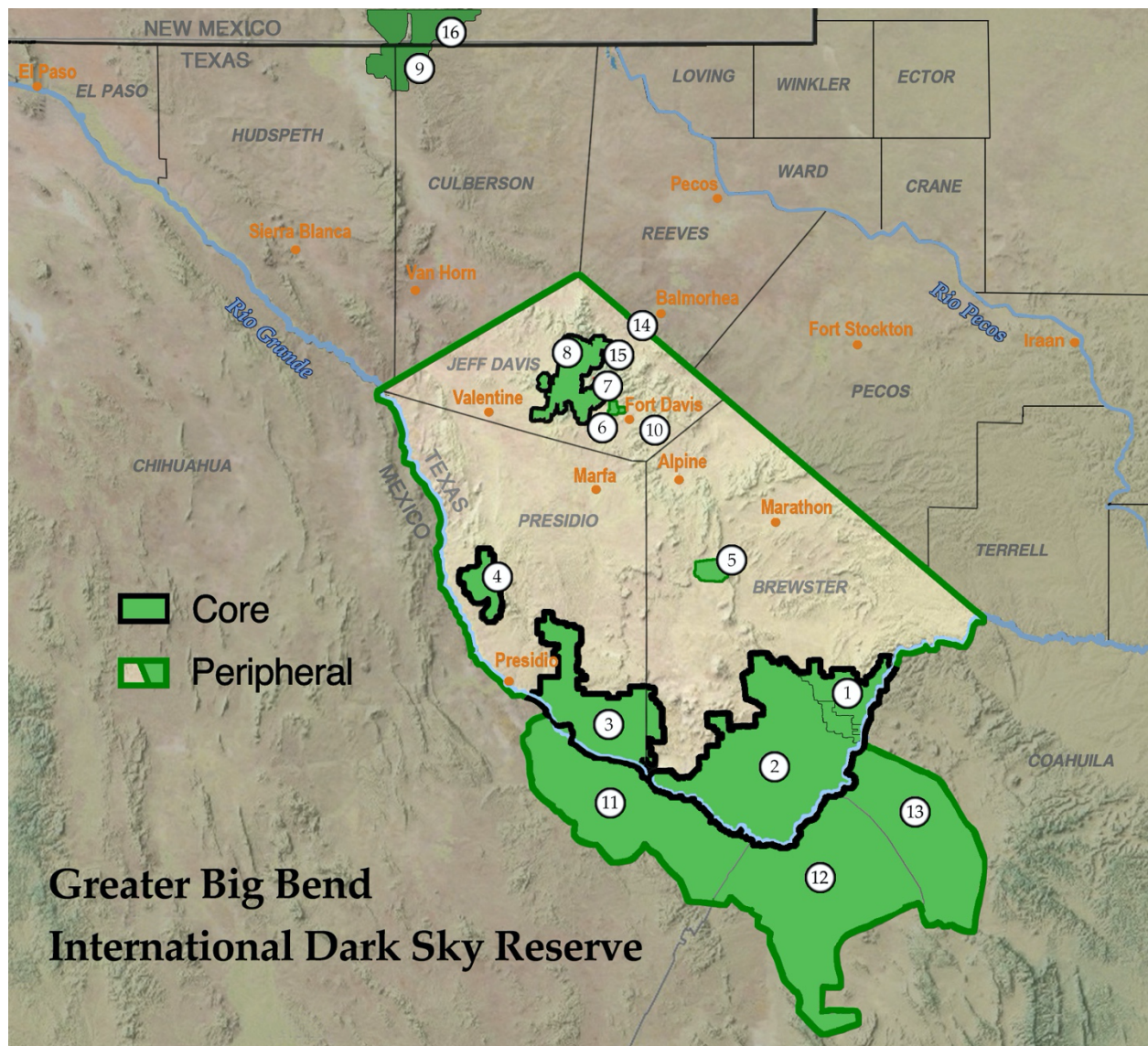
The support of the three Texas counties, and four cities located therein, is also crucial for a successful application. Each of these entities have existing outdoor lighting ordinances originally intended to help protect the night skies for the Observatory. Ordinance language is being revisited to meet IDA criteria and bring it up to date with current outdoor lighting technologies and practices. The language will be used to inform the common LMP agreed to by parties on both sides of the Rio Grande. The primary goals of the LMP are to:

- A. Prevent light from shining wasted into the night sky.
- B. Reduce glare and light trespass onto neighboring properties.
- C. Promote the use of "warm-white" light with a correlated color temperature of 2700 Kelvins or less.
- D. Prevent over-lighting with a lumens-per-acre cap.

V. Summary

The proposed Greater Big Bend International Dark Sky Reserve will require the collaboration of numerous stakeholders: public, private, city, county, state, national, and international. It represents the continuing effort to preserve one of few remaining, naturally dark, and readily accessible, night skies in North America. It will help protect ongoing astronomical research at McDonald Observatory. It will promote awareness of the night sky and education about effective and efficient outdoor lighting practices. The DSR will help protect wildlife habitats and the region will benefit from eco- and astro-tourism.

----- See map below -----



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| 1) Big Bend Ranch State Park | 10) Davis Mountains Preserve-The Nature Conservancy |
| 2) Big Bend National Park; Rio Grande Wild & Scenic River | 11) University of Texas McDonald Observatory |
| 3) El Carmen Land & Conservation Company | 12) Área de Protección Flora y Fauna Cañon de Santa Elena |
| 4) Black Gap Wildlife Management Area | 13) Área de Protección Flora y Fauna Ocampo |
| 5) Chinati Mountains State Natural Area | 14) Área de Protección Flora y Fauna Maderas del Carmen |
| 6) Elephant Mountain Wildlife Management Area | 15) Balmorhea State Park |
| 7) Chihuahuan Desert Research Institute | 16) Guadalupe Mountains National Park |
| 8) Fort Davis National Historic Site | |
| 9) Davis Mountain State Park | |



Bluebonnets in Terlingua (Photo: Jason Weingart)