

**Hill Country Alliance  
Leadership Summit  
September 22, 2016**

**Momentum at the Edge of Night  
A State Parks Perspective**



# An International Dark Sky Park





**ENCHANTED ROCK  
INTERNATIONAL DARK SKY PARK**

[www.darksky.org](http://www.darksky.org)

An International Dark Sky Park is a location of exceptional night time beauty, dark skies education, and preservation of the nighttime environment. Each Dark Sky Park has gone above and beyond the requirements as stated in the International Dark Sky Park Guidelines.





## August 6, 2014 IDA Press Release

Texas state parks remain among the few public places in one of the nation's most populous and increasingly urbanized states where the starry heavens can be viewed in all their celestial glory with only minimal intrusion of artificial light.


Enchanted Rock State Natural Area in the Hill Country and Copper Breaks State Park in the Panhandle Plains are the first Texas state parks to be designated International Dark Sky Parks by the International Dark-Sky Association.



# Gold Tier Dark Sky Park

Enchanted Rock and Copper Breaks, which were awarded the highest “Gold Tier” night skies status by the International Dark Sky Association, join Big Bend National Park and the City of Dripping Springs as the only locations in Texas to have earned the coveted Dark Sky Places recognition.



	 Gold
Artificial Light and Skyglow	Typical observer is not distracted by glaring light sources. Light domes are only dim and restricted to sky close to horizon.
Visual Limiting Magnitude	Equal or greater than 6.8 under clear skies and good seeing conditions
Bortle Sky Class	1-3
Observable Sky Phenomena	The full array of visible sky phenomena can be viewed—e.g. aurora, airglow, Milky Way, zodiacal light, and faint meteors
Unihedron Sky Quality Meter	21.75 or above

# Requirements for Dark Sky Park Status

- Support letters
- General description of the park
- Maps of park or area
- Determine Dark Sky quality
- Description of dark sky monitoring
- Education and preservation
- Outdoor Lighting Guideline
- Lighting inventory and improvement plan

# Establish Appropriate Park Zones



# Establish Outdoor Lighting Guidelines

## Enchanted Rock Lighting Inventory

Location	Light Ref. #	Fixture	Application	Shielded	Special Purpose <600 Lumens	Conforms with GOL
Manager's House	MGR - 1	1 fixture (2 bulbs)-26 watt flood, CFL fully shielded.	Security, house egress ingress, switched, only used as needed, normally off.	YES	No	Yes
	MGR - 2	1 fixture-26 watt flood light, CFL, fully shielded.	Security, house egress ingress, switched, only used as needed, normally off.	YES	No	Yes
	MGR - 3	2 fixtures-25 watt incandescent yellow bug lights, fully shielded.	Security, house egress ingress, switched, only used as needed, normally off.	YES	No	Yes
	MGR - 4	1 fixture-40 watt incandescent white light, shielded under porch roof	Security, front door egress ingress, switched, only used as needed, normally off.	YES	No	Yes
Assistant Manager's House	AMRas-1	1 fixture (2 bulbs)-25 watt incandescent yellow bug lights, fully shielded	Security, carport egress ingress, switched, only used as needed, normally off.	YES	No	Yes
	AMRas-2	1 fixture (2 bulbs)-26 watt flood light, CFL, fully shielded.	Security, backdoor egress ingress, switched, only used as needed, normally off.	YES	No	Yes
	AMRas-3	1 fixture-100 watt LPS with shield.	Highway access to pavilion parking lot, area security. On at dusk with photocell. Pending change to be switched use only.	YES	No	Yes
	AMRas-4	1 fixture (1 bulb)-25 watt incandescent, yellow bug light, fully shielded	Security, front door egress ingress, switched, only used as needed, normally off.	YES	No	Yes

## 3.2 Lighting Prescriptions for Zone 1

7000 lumens is the maximum allowable lamp output (except for emergency lighting). In most cases 500 – 1600 lumens will be sufficient.

Residential Surrounds (Superintendent's House and Assistant Manager's House)	
Maximum Lamp Lumens	1600 lumens
Recommended Light Type	Fully shielded
Recommended Illumination Area	Light dispersal limited to residential boundary
Recommended Duty Cycle	Mix of switches for (for occasional use) and motion sensors.

Comfort Station Building (Restroom Facility)	
Maximum Lamp Lumens (watts)	1600 lumens
Recommended Light Type	Fully shielded
Recommended Illumination Area	Light dispersal limited to entrance of restroom facility and doorways.
Recommended Duty Cycle	On from dusk to dawn to accommodate overnight camping.

Comfort Station Area Lighting	
Maximum Lamp Lumens (watts)	7000 lumens
Recommended Light Type	LPS, fully shielded
Recommended Illumination Area	Light dispersal limited to parking area and for events near Comfort Station
Recommended Duty Cycle	Switched, used only for events and when campers are coming off trails and into parking area.



# Take Lighting Inventory

## Lighting Inventory Photographs

Manager's House (Park Superintendent)



Outside Light Carport  
Photograph Reference: MGR-1



Outside Light Security  
Photograph Reference: MGR-2



Backdoor Light  
Photograph Reference: MGR-3



Front Door Light  
Photograph Reference: MGR-4

# Lighting Improvement and Retrofit Before



# Lighting Improvement and Retrofit After



# Lighting Improvement and Retrofit

Before



After



# Lighting Improvement and Retrofit Before



# Lighting Improvement and Retrofit After



# Lighting Improvement and Retrofit

Before



After



# Lighting Improvement and Retrofit

## Before





# Lighting Improvement and Retrofit

## After

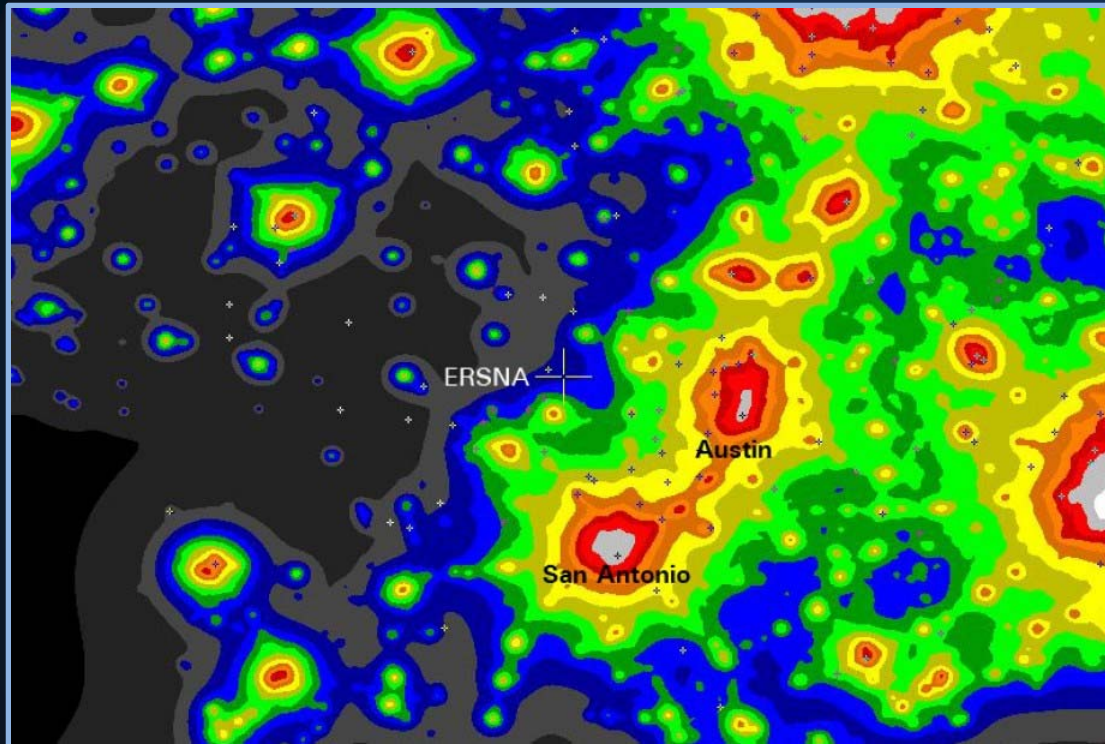


# Lighting Improvement and Retrofit



# Sky Quality at Enchanted Rock

## Bortle Scale and location of Enchanted Rock

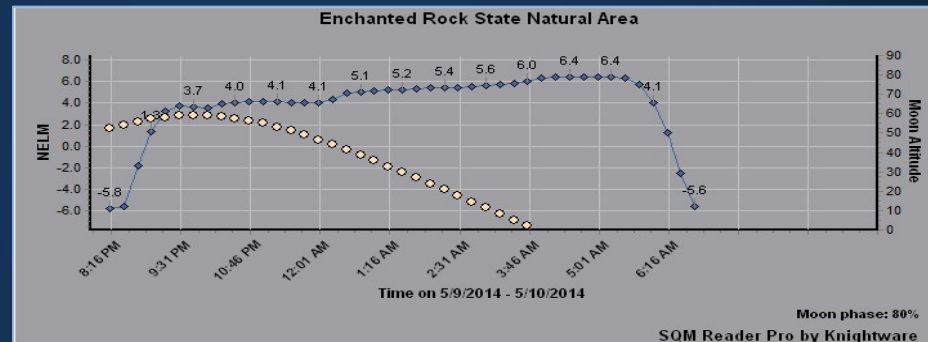
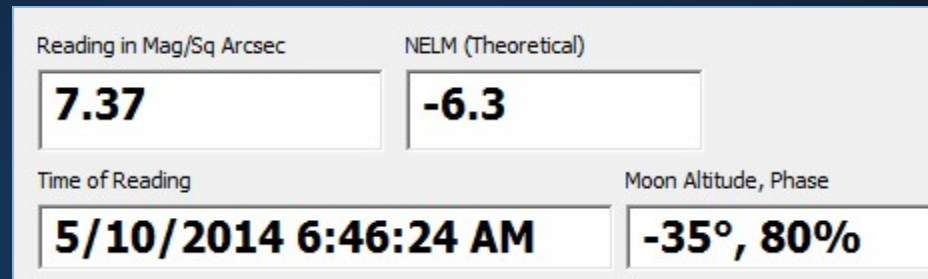


Bortle Scale	Title
1	Excellent Dark Sky Site
2	Typical True Dark Sky Site
3	Rural Sky
4	Rural / Suburban Transition
4.5	Suburban Sky
5	Bright Suburban Sky
6 - 7	Suburban / Urban Transition or Full Moon
8 - 9	City Sky

Enchanted Rock is on the Edge of Night

# Sky Quality at Enchanted Rock

## Sky Quality Monitoring Station

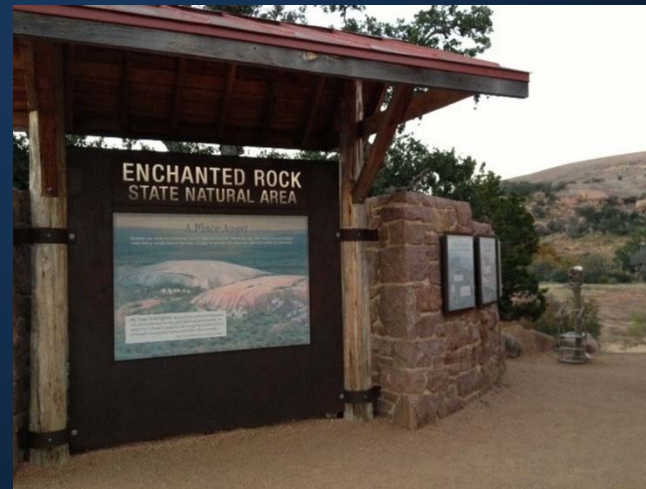


Enchanted Rock had the first sky quality monitoring station in the state of Texas at either a national or state park.

Measurements are posted to the Enchanted Rock website every 15 minutes.

# Interpretive Programs and Education

- Dark Sky Interpretive Program Curriculum
- School and Children Outreach
- Rock Star Parties
- Moon Walks with a Ranger
- Better Lights for Starry Nights
- Dark Sky Education Board
- Enchanted Rock Website
- Park Owned Telescope



# Interpretive Programs and Education

## DARK SKIES, BRIGHT STARS

Cloudless evenings expose mosaics of stars, planets and our own Milky Way filling the sky above Enchanted Rock State Natural Area.

### Witnessing the Cosmos

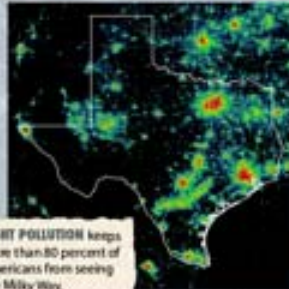


**ENCHANTED ROCK'S REMOTENESS** allows us to gaze in awe upwards at a timeless naturally dark sky. Past civilizations throughout history shared the same wonder. Our stars are a constant of life, like the sun, moon and planets. They inspire poetic stories of light, darkness and good against evil.

### Drowning in Light

**OUR GALAXY'S STARS** are still out there. But, if you live in or near a city, you probably can't see very many of them. In recent years, man-made light pollution has dimmed this amazing spectacle. Overly bright or unshielded lights cause this pollution and affect the health of animals and people.

**WE CAN ALL HELP REDUCE LIGHT POLLUTION** by turning off outside lights, or shielding bulbs so that light only shines downward. This park's night lighting is a shining example for dark-friendly skies. The International Dark Sky Association (IDA) has certified Enchanted Rock as a Gold Level (highest) Dark Sky Park.



**LIGHT POLLUTION** keeps more than 80 percent of Americans from seeing the Milky Way.

### Tonight's Showing:

**ATTACHED IS A MONTHLY LIST** of common constellations. We invite you to the many stargazing programs aimed to help you explore the cosmos. Learn how you can help save the universe...or at least continue to see it!

More information about dark skies including IDA literature, free monthly star charts and books for sale are available at the park headquarters.

(PARK INSERT: TPO)

# Dark Skies Program

The stars at night are big and bright, deep in the heart of Texas.

## Texas State Park's Commitment to Dark Skies

Texas Parks & Wildlife Department has partnered with the McDonald observatory, the International Dark Sky Association (IDA) and local astronomy groups to promote stargazing in our state parks. We hope to raise awareness of preserving night skies with star parties, self-guided constellation tours and light pollution education programs.

In addition, we are reviewing our own lighting, and making changes to protect the night skies over our parks. Enchanted Rock and Copper Breaks state parks are IDA Dark Sky Parks. Enchanted Rock State Park recently installed a sky quality monitoring station.

# Dark Skies Program

The stars at night are big and bright, deep in the heart of Texas.

## Texas State Park's Commitment to Dark Skies

- Calendar of Events and Star Parties
- Bortle Scale Ratings for all Texas Parks
- Resources page for star gazing

Moon rise and set information

Constellations

Viewing techniques

- Gallery of pictures

### Bortle Scale Ratings

#### *Hill Country*

- Blanco State Park (4.5)
- Colorado Bend State Park (3)
- Devil's Sinkhole State Natural Area (2)
- Enchanted Rock State Natural Area (3)
- Garner State Park (4)
- Government Canyon State Natural Area (6)
- Guadalupe River State Park (4.5)
- Hill Country State Natural Area (4)
- Honey Creek State Natural Area (5)
- Inks Lake State Park (4.5)
- Kickapoo Cavern State Park (2)
- Lake Brownwood State Park (4.5)
- Longhorn Caverns State Park (4.5)
- Lost Maples State Park (3)
- Lyndon B. Johnson State Park and Historic Site (4)
- McKinney Falls State Park (7)
- Old Tunnel State Park (4)
- Pedernales Falls State Park (4.5)
- South Llano River State Park (3)



# Dark Skies Program

The stars at night are big and bright, deep in the heart of Texas.

## Texas State Park's Commitment to Dark Skies

“One of our most valued attributes in Texas is its natural beauty,” says Texas State Parks Director Brent Leisure. “This beauty is not limited to the light of day, but extends into the night sky where Texans can enjoy a front-row seat to the splendor of the universe.”


State parks and natural areas offer some of our very best public venues to experience this heavenly show.”



Brent Leisure  
Director, Texas State Parks

# Enchanted Rock International Dark Sky Park

Join us for the 2<sup>nd</sup> Annual  
Enchanted “Rock Star” Festival on  
Saturday, December 3, 2016  
4pm – 11pm

A night sky photograph of Enchanted Rock with the Milky Way visible, reflected in a lake. The rock formation is silhouetted against the starry sky, and its reflection is clearly visible in the calm water below. The overall scene is dark and serene, capturing the beauty of a dark sky location.

# Enchanted Rock International Dark Sky Park

