

DARK SKIES: A JEWEL OF NEVADA

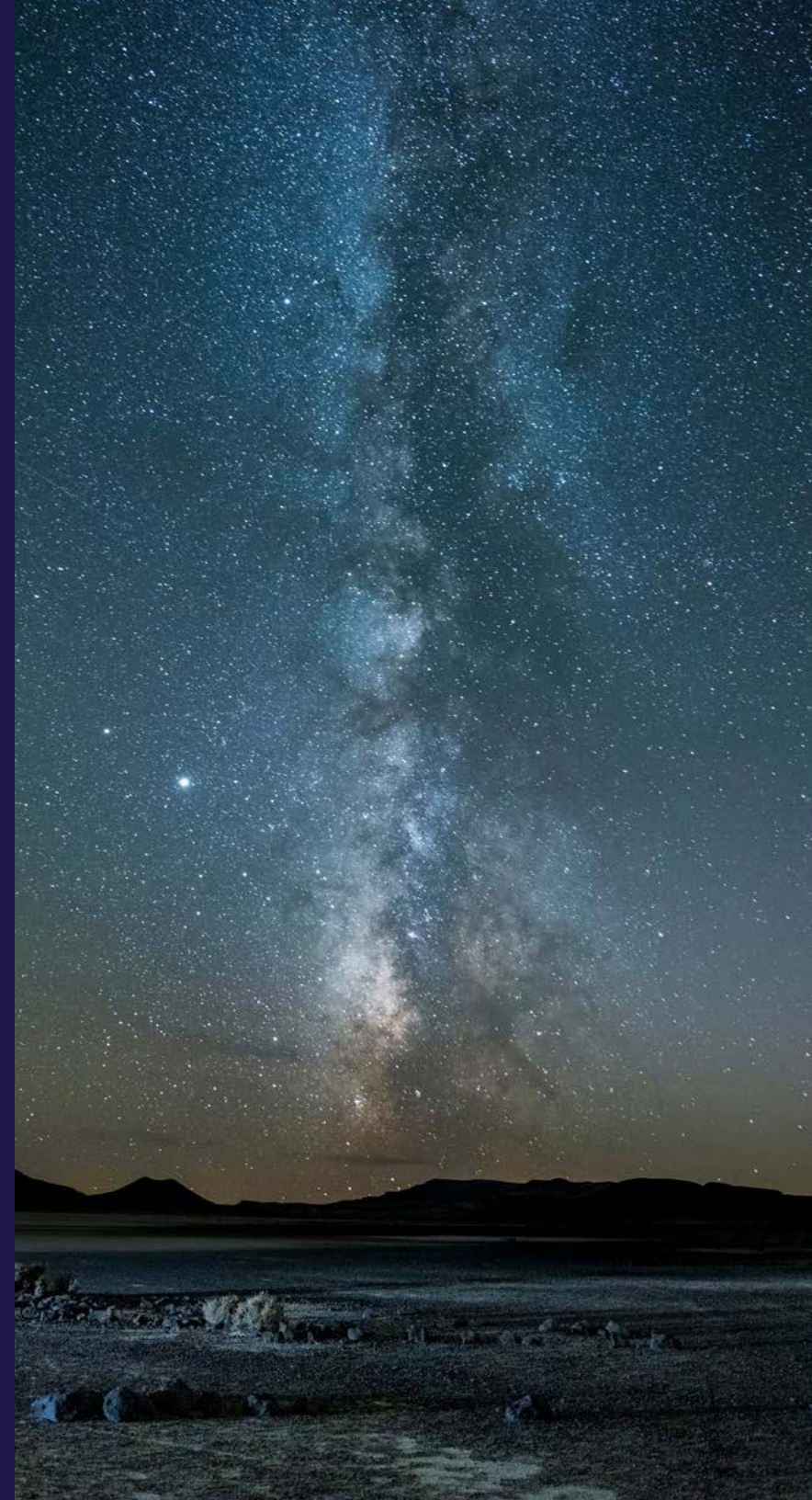
Dark Skies Toolkit





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Special Thanks

Special thanks to the following organizations for contributing resources for this toolkit:



DarkSky

Nevada Division of Outdoor Recreation, ndor.nv.gov

Travel Nevada, travelnevada.biz

Basin and Range Dark Skies Cooperative,
fws.gov/partner/basin-and-range-dark-sky-cooperative

DarkSky International, darksky.org



A WORD FROM OUR DIRECTORS

The Nevada Division of Outdoor Recreation (NDOR) in partnership with Travel Nevada is proud to bring you this **Dark Skies Toolkit** and provide resources to improve conservation efforts and tourism opportunities across Nevada.

One of our state's most distinctive features is the diverse opportunities to participate in outdoor recreation experiences, including unobstructed stargazing. With over 85% of Nevada's land being public, we are fortunate to have access to vast areas of unspoiled terrain, offering some of the **darkest skies in the lower 48 states**.

Dark skies are not only an environmental asset but also a key component of elevating outdoor recreation. As interest in astrotourism continues to rise—driven by celestial events, astrophotography, and wellness trends—Nevada stands out as a premier destination for stargazing.

In rural areas, up to 4,500 stars can be visible to the naked eye, creating a stunning backdrop for outdoor activities like hiking, camping, and photography. Notable dark sky opportunities include Great Basin National Park's "**Half the Park is After Dark**" campaign, the International Dark Sky Sanctuary at Massacre Rim, and frequent stargazing parties at the star gazing park.

Astrotourism can play a crucial role in promoting sustainable travel, raising awareness about light pollution, and supporting local economies.

By collaborating with local astronomy groups, Destination Marketing Organizations (DMOs) can help protect these unique night skies while offering unforgettable experiences. Star parties, moonlit walks, and night-sky festivals all contribute to a growing tourism sector that celebrates Nevada's exceptional natural beauty.

As part of our ongoing efforts to protect these natural wonders Senate Bill 52, which passed in 2021, tasked NDOR with administering a certification program focused on preserving our pristine night skies. In October 2024, NDOR officially launched the **Nevada Starry Skies Certification program**.

This initiative aims to protect our dark skies and mitigate the growing threat of light pollution, ensuring that Nevada remains a prime destination for both outdoor recreation and astrotourism.

We are excited to invite you to explore the opportunities outlined in this toolkit, which highlights the importance of preserving our dark skies while supporting responsible outdoor recreation and astrotourism.

By investing in dark sky initiatives, we not only safeguard these incredible experiences for future generations but also stimulate economic growth and promote sustainable tourism across Nevada. We appreciate the ongoing efforts of local communities, land managers, and outdoor enthusiasts who work together to protect and enjoy our state's natural treasures.


We invite you to be a part of the celebrating and preserving of Nevada's starry skies while fostering a thriving outdoor recreation and tourism economy.



Denise Beronio, Administrator
Nevada Division of Outdoor
Recreation



Rafael Villanueva, CEO
Nevada Division of Tourism
(Travel Nevada)



If people looked at the stars each night, they'd live a lot differently. When you look into infinity, you realize there are more important things than what people do all day.

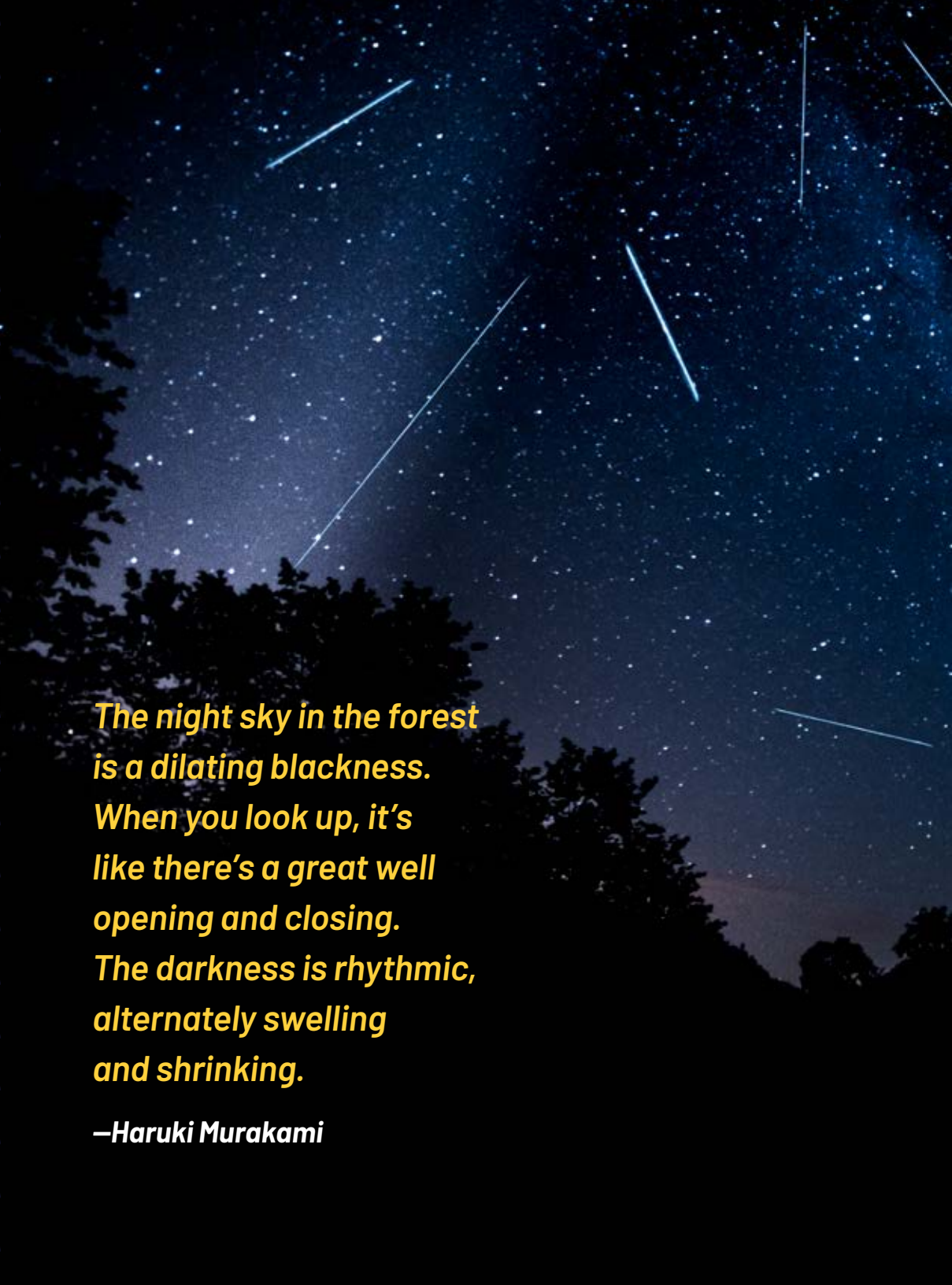
—Bill Watterson

Nevada's DarkSky Certified Destinations

Nevada is home to two DarkSky International certified destinations, consisting of a Dark Sky Sanctuary at **Massacre Rim** and a Dark Sky Park at **Great Basin National Park**.

Death Valley National Park is certified Gold Standard accredited.

Boulder City, Nevada is currently working on its International Dark Sky Communities certification with assistance from an Economic Development Administration grant. This grant funds the retrofitting of lights in Boulder City to be dark sky compliant.

A photograph of a night sky filled with stars and several bright shooting stars streaking across the frame. The sky is dark blue and black, with the silhouettes of trees visible in the foreground.

*The night sky in the forest
is a dilating blackness.
When you look up, it's
like there's a great well
opening and closing.
The darkness is rhythmic,
alternately swelling
and shrinking.*

—Haruki Murakami



THE PURPOSE OF THIS TOOLKIT

Dark Skies: A Jewel of Nevada

Nevada is truly a remarkable state, home to some of the last remaining pristine dark skies in the United States. Our public and private lands offer the rare opportunity to witness a canvas of endless stars—a phenomenon that should be accessible right from our front doors. Yet, light pollution has robbed us of this natural wonder.

This toolkit is designed to inspire action at a local level.

Reducing light pollution in our communities isn't just about preserving the night sky; it's also about protecting our health and safeguarding the plants and animals that depend on natural rhythms of daylight and darkness. Artificial light disrupts sleep cycles, disturbs wildlife, and diminishes connection to the natural world. But together, we can reverse this trend and protect the beauty and balance of our environment.

The stars have always been a source of wonder and inspiration. While most of us may not be astronomers or astrophysicists, we all share the innate desire to look up and marvel at the night sky.

Let's come together to reclaim our night skies.



**DARK SKIES:
A VANISHING
RESOURCE**



THE DANGERS OF LIGHT POLLUTION

What is Light Pollution?

DarkSky International defines light pollution as “the inappropriate or excessive use of artificial light.” Light pollution affects everyone, from the streetlights outside our homes to the artificial lights within.

Outdoor lighting is often overused, excessively bright, and projects light in directions where it is not needed, and can in fact reduce visibility by increasing glare. There are simple and effective ways to minimize Artificial Light at Night (ALAN) while still providing the necessary safety of nighttime lighting. This can be achieved by pointing light downward and using only the amount of light needed, in the appropriate places and at the right times.

Effects of Light Pollution on Human Health

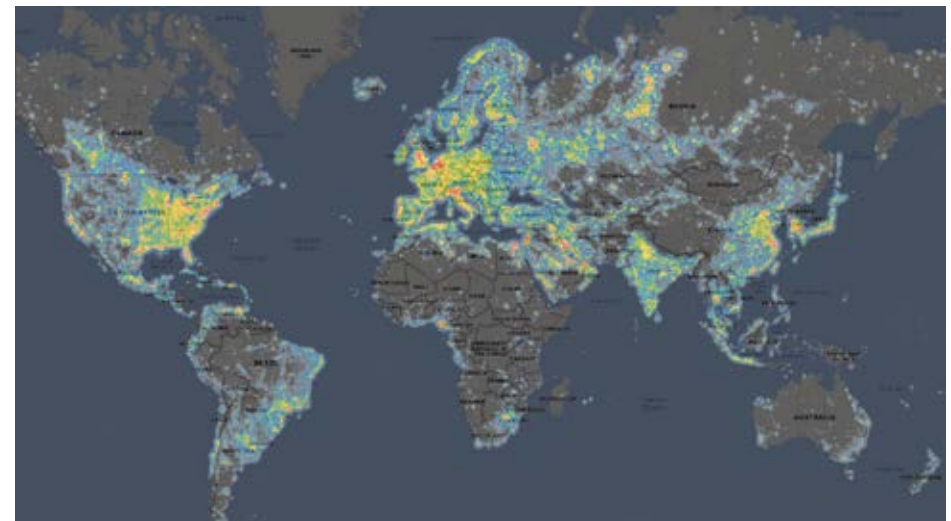
Our bodies rely on natural darkness to maintain healthy circadian rhythms, which regulate our sleep and overall well-being. Disruptions to these rhythms can contribute to a variety of health issues, including sleep disorders, mental health challenges, heart disease, immune system dysfunction, metabolic disorders, obesity, and even cancer.

The alternative to light pollution is not to live in darkness. We must be smart about where and how we use outdoor lights.

—DarkSky International

The blue light emitted from screens and artificial lighting interferes with our natural sleep patterns, making it harder for us to rest and recover.

According to the American Medical Association, “It is estimated that white LED lamps have five times greater impact on circadian sleep rhythms than conventional streetlamps.”

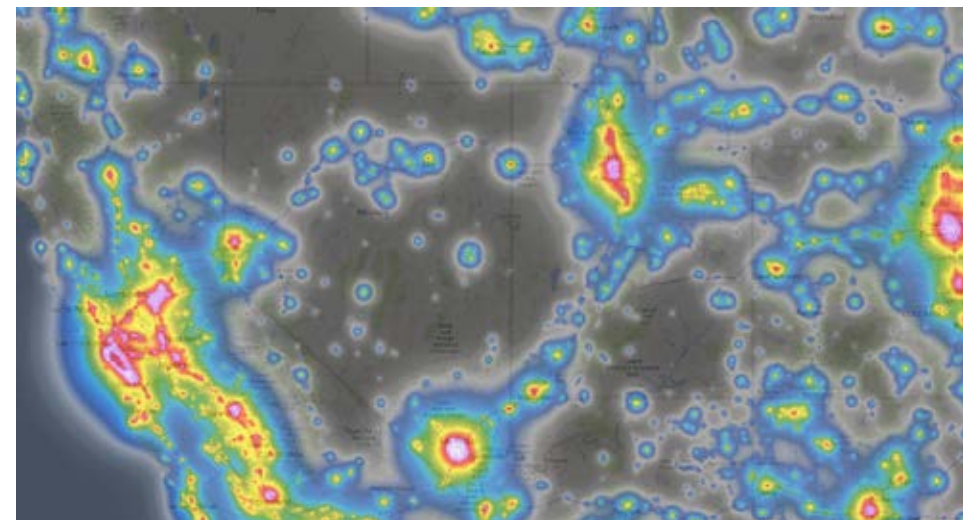
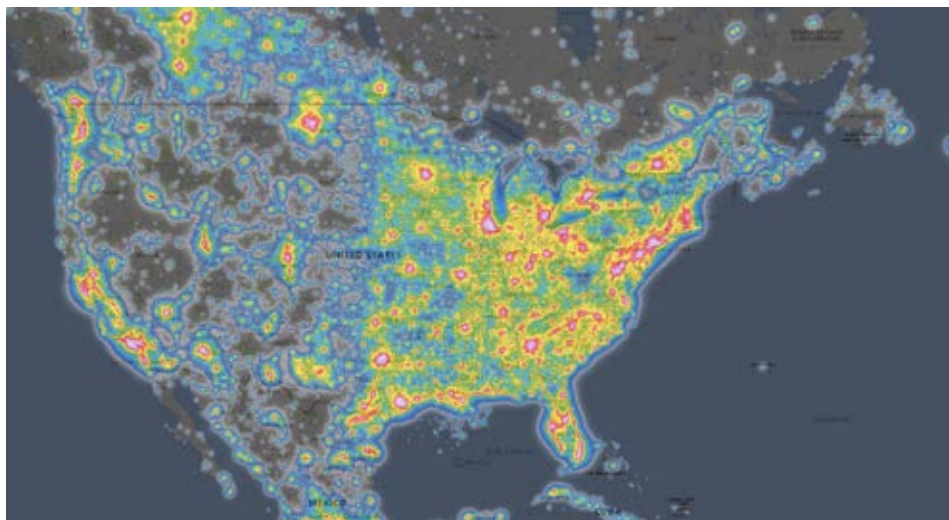


Light Pollution Map



Did You Know?

Light pollution worldwide is increasing at a rate of 10% per year.



Top: DarkSky International; Bottom: Light Pollution Map



Sleeping Under the Stars

Those looking to escape the city lights in search of celestial connections should consider capitalizing on the trend of wellness vacations and the joy of missing out. Encourage yourself and others to unplug by cultivating a screen-free retreat where people can fully immerse themselves in the remoteness and darkness of our night skies. Couple dark skies with options for celestial meditation, yoga, hot springs soaking, and more to share luxury... Nevada style.

Effects of Light Pollution on Wildlife

Moths and other nocturnal pollinators face significant disruptions to their natural rhythms due to light pollution. These creatures rely on darkness to carry out essential tasks like pollinating fruits and plants. However, when streetlamps and outdoor lights are turned on, researchers have found that the number of nighttime pollinators visiting plants requiring pollination drops by 62%. Excessive lighting is disorienting, distracting these pollinators from their vital role in nature.

NEVADA NIGHTLIFE

Life in Nevada doesn't stop when the sun sets! When most people think of Nevada nightlife, they picture the bright lights of Las Vegas and Reno with their world-class casinos, shows, bars and restaurants; but the REAL Nevada after dark is far outside the limits of these two amazing cities. Nevada's deserts come alive at night. Wildlife from coyotes to bobcats to burrowing owls and scorpions emerge after sunset. Nighttime activities such as listening to the soundscape of the desert, or observing (at a safe distance) our desert neighbors can lead to a deeper appreciation of Nevada nightlife. Sharing these experiences as well as the important conservation message of the many ways in which dark skies are also important to our animal friends and

ecology is a family-friendly nighttime experience that will shape young minds and be impactful for years to come.

HOW YOU CAN SUPPORT NIGHTTIME POLLINATORS:

- ★ **Plant Moon Gardens:** Moon gardens are designed to attract nocturnal pollinators by featuring plants that bloom and release fragrance at night. These gardens typically consist of white, pale, or light-colored flowers that reflect the moonlight, making them more visible to pollinators like moths and bats. By creating these gardens, you provide a safe and welcoming environment for nighttime pollinators to thrive.

- ✦ **Keep Light Indoors:** One of the easiest ways to reduce light pollution is to keep indoor lights contained. Close your blinds or draw the curtains at night to prevent light from spilling outside and disrupting nocturnal creatures.
- ✦ **Choose the Right Lighting:** Color matters when it comes to minimizing light pollution. Use warmer-colored light bulbs and avoid blue-violet light, which is particularly disruptive. Opt for bulbs

with a temperature of no more than 3000 kelvins to reduce the impact on pollinators and other wildlife.

- ✦ **Use Outdoor Lighting Wisely:** Be mindful of when and where you use outdoor lighting. Install motion detectors, timers, or dimmers to limit the duration of lighting. Motion-triggered lights are an excellent way to address safety concerns while minimizing unnecessary light exposure.



Protecting Nevada's Primroses

Nevada is home to **21 different species of primrose (genus *Oenothera*)**, including the fragrant evening primrose, which is dependent on hawk moths for pollination.

Some primrose species in Nevada are rare and imperiled, making it even more critical to protect the nocturnal pollinators that sustain them.

By taking action to reduce light pollution, we can help ensure the survival of these unique plants and the moths that keep their ecosystems healthy.



THE BASICS OF DARK SKIES

DETERMINING THE QUALITY OF A NIGHT SKY

The Bortle scale was established in 2001 by John Bortle, as a tool and resource for amateur astronomers to determine the darkness of a site.

Based on a scale of 1-9 with 1 being the darkest sky available and 9 being typically assigned to a large urban

center, a rating is assigned based on the astronomical observability of celestial objects (e.g., visibility of certain deep space objects, details of the Milky Way band, and naked-eye limiting magnitude, the dimmest star magnitude seen without optical aids).

Another way to determine the quality of the night sky is to use a Sky Quality Meter (SQM), a handheld device that is typically used for taking sky brightness measurements. These devices are easy to use and can be

purchased directly from various manufacturers. For the SQM, the higher the number, the darker the sky—a number of 20 or 21 indicates the

stars and Milky Way are visible with the naked eye. Numbers between 16-17 indicate artificial light is impacting

the site, or the moons brightness is reducing visibility.

The Natural Sounds and Night Skies Division of the National Parks Service has placed several night sky data collection sites in southern and eastern Nevada (see sidebar).

While these few sensors collect some data, further monitoring of the quality of our dark skies is needed in Nevada.



FUN FACT:
Great Basin National Park has a Bortle Scale rating of 1.

Night Sky Data Collection Sites

- ✦ Lake Mead National Recreation Area
- ✦ Floyd Lamb State Park
- ✦ Mt Charleston Highway
- ✦ Tule Springs Fossil Beds National Monument
- ✦ Death Valley National Park
- ✦ Great Basin National Park

Look up!

Next time you step outside at night, look up:

- ✦ How many stars can you see?
- ✦ What is impeding your ability to clearly see the night sky?
- ✦ How can you take action to improve the night skies?

Common Misconceptions

There are several misconceptions about dark sky lighting. To address some of the common concerns about converting to dark sky-compliant lighting, we have provided additional explanations to combat these misperceptions.

PERCEPTIONS OF COST

One common misconception is that converting to dark sky-compliant lighting is expensive. This idea often appears at the top of the list when discussing why communities hesitate to make the switch.

Cost savings: Researchers estimate that 30% of outdoor lighting in the U.S. is wasted by lights that aren't shielded, costing consumers \$3.3 billion in excess energy charges and releasing 21 million tons of carbon dioxide per year. To offset these emissions, 875 million trees would need to be planted annually.

PERCEPTIONS OF SECURITY

A common misconception about security is that more light is better. In reality, brighter lights often produce excessive glare, making areas outside the illuminated zone harder to see. This can hinder our eyes' ability to adjust to low-light conditions.



MYTH:
More lighting is safer,
when in reality, well-
designed lighting is safer.



EXAMPLE: The town of Truckee, CA, in partnership with Climate Transformation Alliance and the Sierra Business Council, launched a rebate program for local residents and business owners who want to swap out old exterior lighting for newer lighting that is downward facing and energy efficient.

Dark Sky Storytelling

Outstanding visitor experiences are grounded in making lifelong memories and establishing meaningful connections. Humans are hardwired for telling stories. It's how we share information, connect with others, and understand the world around us.

Storytelling represents an important tool for helping visitors cultivate an appreciation and understanding for the culture, history, and values of your community.

Dark skies, in particular, have served as both the subject of, and backdrop for, remarkable stories for millennia. Today, we can help visitors create their own remarkable starry sky stories through compelling visitor experiences.

THINKING BIG, FEELING SMALL

While our ancestors relied on the sky for everything from navigation and farming to religion, physics, and the seasons, modern cultures have become disconnected from the night sky.

For many Nevada visitors, the stars are not visible from their homes. For some, a trip to Nevada may be their first experience

viewing the cosmos, gazing at the glow of the Milky Way in awe. For others, a night sky experience may harken back to their childhoods and evoke cherished memories of a summer at camp or sitting around the campfire with their family.

As destination leaders, crafting a unique and authentic dark skies experience begins with a little bit of creativity and dedicating time to learn about the history and ongoing interplay between your community and the night sky. Take the time to uncover what attributes of your destinations set it apart from other dark sky locations. A top-notch visitor experience is not just predicated on very dark skies—although that's certainly part of it!

What added elements can you weave into your destination's visitor offerings to create a one-of-a-kind, only-in-Nevada adventure? How can you capitalize on your history, culture, and mythology to connect your visitors to the night sky?





COWBOYS AND CONSTELLATIONS

The allure of the Old West is alive and well in Nevada. Imagine enjoying a chuck wagon dinner and then gathering around the campfire for some traditional cowboy poetry and stargazing.

The Western Folklife Center's annual Cowboy Poetry Gathering in Elko provides inspiration for the storytelling aspect, and an offshoot dark skies campout could extend the appeal for cowboy poetry enthusiasts to return for another stay. Take it a step further and offer a real Old West experience with a celestially guided cattle drive, just like they did in the old days!

EARTH TO E.T.

Maybe your destination resonates more with Men in Black than it does with cowboys. Could your night skies expedition be a search for extraterrestrials? A curated alien-themed, after-dark storytelling and spaceship-spotting excursion may be just the thing to entice amateur UFO enthusiasts to spend an extra day in your destination. The lore and stories associated with Area 51 and space are compelling, and nowhere else does it like Nevada!

CELESTIAL SOJOURN

Looking for more inspiration? You can find it all over Nevada! 3D Project grant recipient and environmental stewardship non-profit Friends of Black Rock High Rock (FBRHR) capitalizes on the unmatched open space of the Black Rock Desert and its extraordinarily dark skies to host one of its flagship annual events, the Perseids Meteor Shower Campout.

The annual member event features telescope viewing, scorpion searching, night guided bike rides, a stewardship event, and more. This event alone makes paying your FBRHR membership dues worth it!

In White Pine County, Nevada Northern Railway (NNRY) and Great Basin National Park team up for the Star Trains. These nighttime excursions pull out of Ely with the Dark Sky Rangers of Great Basin National Park aboard.

These rangers love the night sky and happily share their wealth of knowledge with fellow passengers, pointing out interesting things in the heavens on the journey. Midway through the ride, the train stops at NNRY's viewing platform away from town and passengers have an opportunity to view the night sky through a special telescope.

LIGHTS OUT

Stargazing is a reminder that we're just tiny specks in a gigantic universe, but that doesn't mean you can't think big when it comes to utilizing your dark sky assets to generate visitation to your community.

Dark sky storytelling doesn't just deliver a compelling visitor experience, it also provides a unique platform for visitor education. Communities should not miss this unique opportunity to advocate for dark sky protection and inspire visitors to become champions for preservation of our night skies. If we cannot see the stars, the stories cannot be told and may be lost forever.

Nevada's 28 tribes have called the Great Basin home for 10,000 years.

The first people in what is now Nevada thrived here and stewarded this land for generations, looking to the night sky for guidance as they traveled throughout the region, planted and harvested crops, and performed sacred rituals honoring their ancestors.

Today, the tribes of the Great Basin still revere the night sky and celebrate the role the stars play in their storytelling traditions. The Duck Valley Shoshone-Paiute Tribe recently received a grant to construct a first-of-its-kind observatory on its reservation to share the night sky with visitors and to help preserve its culture alongside unmatched views of the heavens.

To see how your destination can incorporate an indigenous perspective in your dark skies tourism efforts, reach out to Nevada's Indian Territory.



A night sky filled with stars and streaks of light from a meteor shower. In the foreground, a gnarled, ancient-looking tree stands on a rocky outcrop. The sky is a deep blue, and the tree's trunk is a warm, golden-brown color. The overall scene is dark and atmospheric.

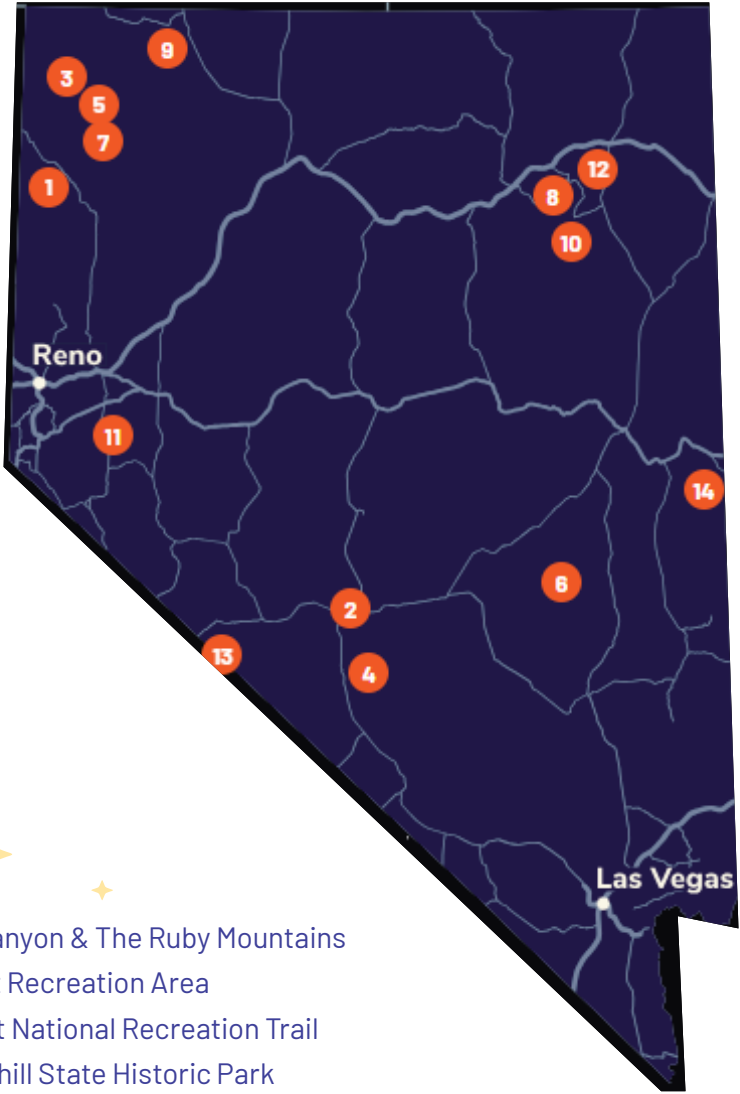
DARK SKIES IN NEVADA



STARGAZING IN NEVADA

Nevada is home to some of the most abundant dark skies in the country. Unblemished, unbelievably clear starry nights can be found in all corners of the Silver State thanks to Nevada's bountiful open spaces.

Dark sky sanctuaries await on the outskirts of Ely, Tonopah, and Gerlach, where solitude is felt and nature runs wild. Currently, Travel Nevada promotes 14 dark sky locations, a list that will hopefully grow as a result of this toolkit.



- 1. Granite Mountain Reservoir
- 2. Tonopah Stargazing Park
- 3. Massacre Rim
- 4. Diamondfield Gulch
- 5. High Rock Canyon
- 6. Basin and Range National Monument
- 7. Black Rock Desert
- 8. Lamoille Canyon & The Ruby Mountains
- 9. Pine Forest Recreation Area
- 10. Ruby Crest National Recreation Trail
- 11. Fort Churchill State Historic Park
- 12. Angel Lake
- 13. Boundary Peak Wilderness - Inyo National Forest
- 14. Great Basin National Park

Great Basin National Park

Designated an International Dark Sky Park by DarkSky International—a rare and coveted title—stargazing in Great Basin National Park (GBNP) is home to what astronomers call some of the last true dark night skies in the United States. GBNP is also part of the Night Skies Program within the National Park System, which only a handful of national parks qualify for.

Home to the annual Great Basin Astronomy Festival in September, astrotourists gather for star telescope viewing and star parties, to hear from professional astrophysicists and astronomers, to attend observatory tours, astrophotography workshops, and create art in the dark.



Tonopah

The quintessential experience for the prepared astrotourist, Tonopah's Stargazing Park has been outfitted with picnic tables and concrete pads as the perfect place to stage telescopes or long-exposure cameras. This is a strict BYO (bring your own) equipment park, so some preparation is required – otherwise enjoy the view with the naked eye.

Death Vally National Park

Accessible from [Beatty](#), [Amargosa Valley](#), and [Pahrump](#), Death Valley National Park is an incredible place to explore by day, and just as breathtaking (if not more!) at night. With some of the best stargazing in the country thanks to almost zero surrounding light pollution, Death Valley National Park has been designated as a Gold Tier Dark Sky Park—the highest rating of darkness by DarkSky International. In February, astrotourists can attend the Death Valley Dark Sky Festival in Amargosa Valley.



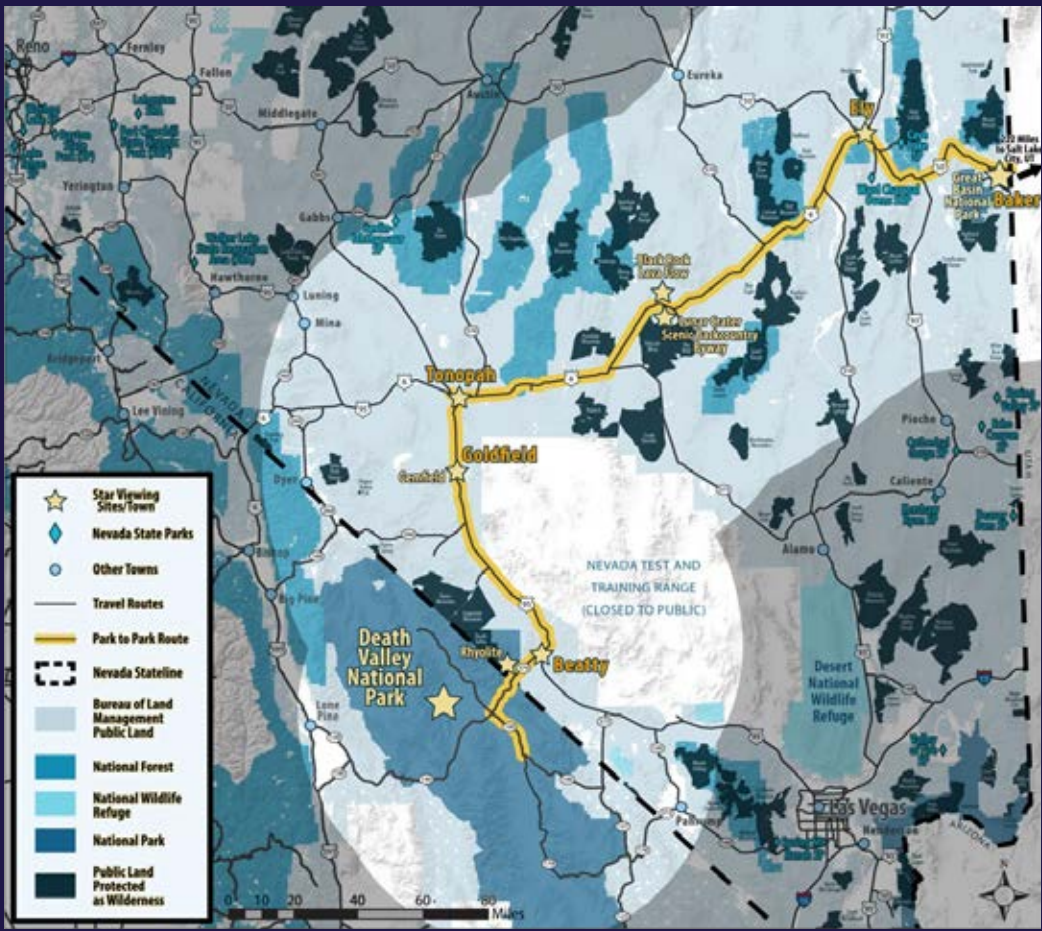
Save Starry Skies License Plate



Friends of Nevada Wilderness launched Nevada's first Save Starry Skies license plate, available at Department of Motor Vehicles (DMV) locations across the state.

Registration fees fund dark sky monitoring, public education, astrotourism promotion, and lighting improvement and/or changes. More information can be found on the Friends of Nevada Wilderness website.





Astronomy Routes

Nevada’s own **Park to Park in the Dark** is Nevada’s first astronomy route. Utilizing existing infrastructure, the route connects two International Dark Sky Parks and 5 rural towns along routes US-95 and US-6.

Tourism routes are an effective and low entry type of destination development and marketing. Utilizing existing infrastructure and themes, routes can provide a day-by-day or inspirational itinerary for tourists to engage with.

The background of the image is a dark night sky filled with stars. A prominent feature is the Milky Way galaxy, which appears as a bright, hazy band of light stretching across the right side of the frame. In the foreground, there is a dark, rocky structure that looks like a natural rock formation or a small building. It has several rectangular openings, some of which are illuminated from within, casting a soft glow. The overall scene is serene and evokes a sense of being in a remote, starry location.

STARRY SKIES CERTIFICATION

NEVADA'S STARRY SKIES CERTIFICATION

Nevada was the first state to pass legislation—SB 52 in 2021—creating a state dark skies' certification program. The Nevada Starry Skies Certification is focused at the community level to ignite awareness and action in the state of Nevada.

The certification program goes hand-in-hand with DarkSky International's mission and vision. NDOR seeks to initiate dialogue about the negative impacts of light pollution and inspire action and education.

We understand that tackling light pollution can be overwhelming. We invite you to think globally and act locally; small changes at the local level help move this critical conversation forward.

Our hope is that with concerted efforts in our communities, we can achieve the preservation of Nevada's dark skies.



The Nevada Starry Skies Certification's purpose is to promote and preserve Nevada's dark skies through infrastructure changes and education on the importance of dark skies.

Requirements & Eligibility



The Nevada Division of Outdoor Recreation is excited to include businesses in the certification process. This certification encourages businesses to work with one another in urban and rural areas of Nevada to reduce light pollution within their community.

Applications are open annually from October 1st- 31st .

ELIGIBILITY REQUIREMENTS:

The proposed site may be located on public or private land in the State of Nevada with written consent or permission from respective private or public landowners.

WHO IS ELIGIBLE:

- ★ Schools (K-12 public and private, higher education programs)
- ★ Tribal Governments
- ★ Homeowners Associations
- ★ Businesses
- ★ Parks and Open Spaces
- ★ Municipalities
- ★ Unincorporated Communities

| Category | Nevada Starry Skies Certification Requirements |
|---------------------------------------|---|
| Schools | Adopt an internal policy for the school, that includes dark sky compliant lighting. |
| Tribal Nations | Implement a dark sky lighting policy or ordinance. |
| HOA's* | Adopt a dark sky lighting CC&R. |
| Downtown Business Associations | Install and upkeep dark skies compliant lighting on the exterior and interior of participating buildings. Compile a plan for reducing light creep from the interior of the establishment onto the sidewalk or outside. |
| Park/Open Spaces | Develop a Management Plan for the proposed site OR adopt an internal lighting policy that requires dark sky compliant lighting throughout the park/open space. |
| Municipalities | Implement a dark sky lighting policy or ordinance. |
| Unincorporated Communities | Implement a dark sky lighting policy that the community collectively agrees to abide by OR pass a dark sky lighting ordinance. |

*Homeowners Association CC&R will only include facilities owned by the HOA and street lighting. Residential lighting included in the CC&R is not a requirement for this program.

Benchmarks: Provide measurable benchmarks in plan implementation.

Creating a Management Plan, Ordinance, or Lighting Policy

As part of the certification process, eligible entities will create and implement a management plan or produce a lighting policy or ordinance. These plans should focus on the Five Principles of Responsible Outdoor Lighting, which guides lighting use to be useful, targeted, low level, controlled, and warm-colored.

| Five Lighting Principles for Responsible Outdoor Lighting | | DarkSky | IES Illuminating Engineering Society |
|---|-----------------------|--|--------------------------------------|
| Responsible outdoor lighting is | 1 Useful | Use light only if it is needed All light should have a clear purpose. Consider how the use of light will impact the area, including wildlife and their habitats. | |
| | 2 Targeted | Direct light so it falls only where it is needed Use shielding and careful aiming to target the direction of the light beam so that it points downward and does not spill beyond where it is needed. | |
| | 3 Low Level | Light should be no brighter than necessary Use the lowest light level required. Be mindful of surface conditions, as some surfaces may reflect more light into the night sky than intended. | |
| | 4 Controlled | Use light only when it is needed Use controls such as timers or motion detectors to ensure that light is available when it is needed, dimmed when possible, and turned off when not needed. | |
| | 5 Warm-colored | Use warmer color lights where possible Limit the amount of shorter wavelength (blue-violet) light to the least amount needed. | |

DarkSky International

Starry Skies Certification



NDOR is very excited to bring a Starry Skies certification to Nevada!

Please email nvstarryskies@ndor.nv.gov to learn more about our certification program.

We also encourage everyone to read more about the program by visiting ndor.nv.gov/dark-skies.

HOAs: A Crucial Role

Dark sky principles and HOA rules play a crucial role in minimizing light trespass and preserving the natural darkness of the night sky. The Avimor development in Eagle, Idaho, a master-planned community, is designed with a focus on minimizing light pollution and preserving their dark skies, aligning with the City of Eagle's and the International Dark-Sky Association's standards.

By selecting proper outdoor lighting fixtures, directing lights appropriately, and using timers and motion sensors, homeowners can contribute to minimizing light trespass within their properties.

Education and awareness campaigns, along with collaborative efforts between local organizations, homeowner associations, and residents, further promote responsible outdoor lighting practices and create sustainable and beautiful communities.

Through the collective commitment of individuals, communities can ensure that future generations can enjoy the beauty of the night sky, while also benefiting from reduced energy consumption, improved well-being, and a more harmonious relationship between artificial lighting and the natural world.

By adhering to dark sky principles and complying with HOA rules on light trespass, we can create a brighter future for both our communities and the stars above.



Lighting Ordinances refers to a set of local laws or regulations designed to reduce light pollution by controlling outdoor lighting within a municipality or unincorporated community. The ordinance should seek to reduce light pollution by citing specific lighting requirements that promote dark sky lighting.

Internal Lighting Policy refers to guidelines or rules adopted by an organization, entity, or business to manage outdoor lighting.

As part of the certification process, each eligible entity will need to provide a lighting management plan which includes a lighting inventory and create lighting zones that fit within the guidelines of the Five Principles of Responsible Outdoor Lighting.

Lighting plans must identify lights that need to have dimmers, motion sensors and timers. Lights should have shields retrofitted on the lights to direct light downwards.

LIGHTING PLANS INCLUDE THE FOLLOWING:

- ★ Location
- ★ Purpose
- ★ Manufacturer, including lamp specifications and a light distribution chart
- ★ Model number
- ★ Lamp type/spectrum
- ★ Initial lamp lumens
- ★ Operational details such as the usage of adaptive controls
- ★ Creating lighting zones:
 - LZ0:** No Ambient Lighting
 - LZ1:** Low Ambient Lighting
 - LZ2:** Moderate Ambient Lighting
 - LZ3:** Moderately High Ambient Lighting
 - LZ4:** High Ambient Lighting



Education and Outreach

Education and outreach are essential components for the Nevada Starry Skies Certification. By informing communities about the benefits of dark skies, we empower individuals to make informed choices about outdoor lighting, ultimately leading to more sustainable practices. Outreach further amplifies these efforts by engaging diverse groups, from local residents to policymakers, in active dialogue and collaboration.

A WIDE VARIETY OF ACTIVITIES QUALIFY AS EDUCATION AND OUTREACH:

- ✦ **Social media:** Start a social media campaign or post at least 5 times about the importance of dark skies and any upcoming events or activities. Consider collaborating with other partners to reach a broader audience.
- ✦ **Host community roundtables or workshops about dark skies:** Invite local stakeholders to discuss the importance of reducing excessive lighting in the community.
- ✦ **Create a dark sky photography or art contest:** Invite the community to get creative and submit photographs and artwork honoring the cosmos.
- ✦ **Dark sky-themed film screenings:** Invite the community to come together to view video clips and documentaries about celestial skies or light pollution.
- ✦ **Install educational kiosks or interpretive signs** at schools or campgrounds showcasing dark sky lighting and its importance.
- ✦ **At local businesses,** place signs in the front of shops or at the checkout stand promoting dark sky lighting used in the store and the benefits of warmer toned lighting.
- ✦ **Astronomy clubs:** We encourage those interested in the cosmos to start or join a local astronomy club either through your school or in your community. These types of programs can offer hands-on activities to connect individuals with the universe. Nevada already has established astronomy groups. (See sidebar.)



Astronomy Clubs in Nevada

There are only a few listed below but if you have an astronomy group, our division would like to hear from you!

Please email:
nvstarryskies@ndor.nv.gov

- ✦ **Astronomical Society of Nevada**
- ✦ **The Las Vegas Astronomical Society**
- ✦ **Western Nevada Astronomical Society**

A Note to Teachers



Teaching younger generations

about the hazards of light pollution and the wonders of the night sky is a priority for the Nevada Starry Skies Certification program.

By introducing students to the marvels of the night sky, teachers can help them understand the vital role it plays in our ecosystem.

Through hands-on lessons on astronomy, environmental science, or even art, teachers can provide students with the tools to see the night sky in a new light.



Types of Dark Sky Tourism

TOURS

Guided and/or packaged experiences can be sold to tourists who want a curated experience when looking at the stars. Tour packages include a guide and transportation to a dark sky location, storytelling and educational facts, and a variety of tools (telescopes, binoculars, cameras, and

tripods). Enhancements can include photos of participants against the starry sky, food and beverages, and comforts such as chairs and blankets. An example of this can be found at Moab Dark Sky Tours and Veronika's Adventure, both in Utah.

ASTROPHOTOGRAPHY

Astrophotography is the act of capturing the night sky, celestial and planetary bodies, or special events. Astrophotographers may engage in the activity on their own or in a group.

Astrophotography tours and workshops have become popular in dark sky locations around

the world, for example Arizona hosts the 2025 Monument Valley Astrophotography Workshop and Tours. These tours and workshops include an educational component on the technical aspects of astrophotography.

PHENOMENON

Phenomenon tourism has been identified by Expedia as one of the top trends of 2025, building on its success in 2024 that was driven by solar eclipses and northern and southern lights due to increased solar flare activity. Other types of celestial phenomenon include the arrival of comets, alignment and visibility of planets, and meteor showers. The trend indicates that tourists are willing to travel to farther destinations in order to experience these once in a lifetime celestial events.

Ely's Ring of Fire Eclipse Festival

In October 2023, Nevadans experienced the power of astrotourism firsthand when it found itself in the path of eclipse totality. The community planned a four-day festival celebrating the Ring of Fire annual solar eclipse by leveraging existing tourism and community assets by packaging outdoor adventures, nighttime activities, arts and cultural experiences, educational series, and more.

Nevada Observatories

Nevada is home to several observatories that are open to the public .

JACK C. DAVIS OBSERVATORY

Carson City, NV

The Jack C. Davis Observatory at Western Nevada College in Carson City is a premier place in northern Nevada to get ‘up close and personal’ with the moon, stars, and planets. With both interior and exterior telescopes and perched on the eastern edge of the Sierra Nevada, the Davis Observatory is the place to be for astronomical happenings, planetary walks, and informative classes that keep students, scientists, and the community on the edge of the latest technological advances.

Source: Jack C. Davis Observatory

GREAT BASIN OBSERVATORY

Baker, NV

The Great Basin Observatory is the first research-grade observatory ever built in a U.S. National Park. Set at an elevation of 6,825 feet, with no significant man-made light for 70 miles in all directions, the observatory is a state-of-the-art, remotely operated, optical astronomical telescope.

Source: About the Observatory | Great Basin Observatory

FLEISCHMANN PLANETARIUM

Reno, NV

The Fleischmann Planetarium and Science Center, originally named the Fleischmann Atmospherium-Planetarium, was built in 1963 on the University of Nevada, Reno campus. It was the first planetarium in the U.S. to feature a 360-degree projector with the ability to provide horizon-to-horizon images and utilize time-lapse photography to review an entire day’s weather in just a couple minutes.

Source About the Planetarium | Fleischmann Planetarium | University of Nevada, Reno

THE DALE ETHERIDGE PLANETARIUM

North Las Vegas, NV

Southern Nevada’s only public planetarium, where the stars are literally the stars of the show...the 66-seat theater features an Evans & Sutherland Digistar 5 high definition hemispheric video projection system...[and an] impressive 30-foot dome.

Source Planetarium | College of Southern Nevada

Looking to be a better neighbor?



DarkSky International offers a program that asks homeowners and renters to assess the type of lighting on the exterior of their house. Households looking to be better stewards of the night sky can receive a Dark Sky Friendly Home certification upon completing several steps:

- ✦ Evaluate each outdoor light on the property by using the Five Principles for Responsible Outdoor Lighting (pg. 27) and complete a simple home lighting inventory form.
- ✦ Improve any of the fixtures that do not check all the boxes on the home lighting inventory.
- ✦ Confirm that the luminaires are now dark sky friendly by recording the date that the necessary action was taken.
- ✦ Submit results to DarkSky International and receive a Dark Sky Friendly Home certificate!

There are many ways to take individual action to engage communities in starting a discussion about the preservation of dark skies.

DARK SKY TOURISM & DESTINATION DEVELOPMENT



IMPLICATIONS IN DESTINATION DEVELOPMENT



Dark Sky tourism has the potential to inspire the preservation of Nevada's dark skies and be a tool within destination development.

Dark skies are, location depending, available year-round which can help drive visitation in off-peak seasons. Some of the darkest skies are found in rural areas with minimal light pollution. This asset can spur rural distribution, motivating tourists to go beyond urban destinations, thereby disbursing tourism spending to rural communities. The minimal infrastructure needed for dark sky tourism and the inherent synergy with conservation and the natural

environment creates an opportunity for eco-tourism: a form of tourism that focuses on responsible travel to natural environments. It is also a vehicle for destination stewardship, focusing on creating positive impacts on local tourism economies, environments, and communities. Additionally, through the incorporation of indigenous storytelling, dark sky tourism has the potential to preserve indigenous knowledge and history.

The Outdoor Adventure Connection

Astrotourism promotes a responsible form of eco-tourism and those who engage in it have a high appreciation for the natural environment. State and national park's characteristically high-quality, protected night skies lend themselves to regular visits from astrotourists. Nevada is unique because more than 85% of the state is made up of public land. Which is why Travel Nevada's current campaign, *Get A Little Out There*, focuses on the vast opportunities for outdoor adventure the state has to offer. The brand's positioning has been identified as Outdoor Recreation+, which includes all types of outdoor recreation, in combination with the state's history and heritage, arts and culture, and food and beverage offerings.

Outdoor enthusiasts who enjoy nature-based adventure have a high probability of being interested in dark sky tourism. Rural destinations that have outdoor recreation or are gateways to state and national parks can capitalize on this visitor segment by incorporating dark sky experiences and messaging into their promotional activities.





Uncommon Accommodations

Accommodations that embrace the night sky have been built to maximize viewing and have amenities like stargazing books and literature, stargazing activities, and even telescopes in guestrooms. An example of dark sky-specific accommodations is Star Struck Glamping in Texas, which offers a luxury eco-tourism product with purpose-built geodesic domes providing panoramic views of the dark sky reserve. Castle Hot Springs outside of Phoenix

is a secluded destination with luxury sky-view cabins with decks that have hot tubs (fueled by hot springs) and telescopes for the ultimate stargazing experience. Hotel Jackson in Jackson, Wyoming, embraces its dark skies with a self-guided Star Walk App experience and strategically placed telescopes on the resort property. Upgrade options include a private walk with an expert.

Developmental Barriers

As with any developmental opportunity, there are speedbumps that may impact growth. Barriers can include the unpredictability of weather, cost and transportation of equipment, lack of tourism infrastructure in rural communities (food and beverage outlets, accommodation, and transportation), undeveloped roads to dark sky locations, and a knowledgeable workforce. While weather cannot be controlled, infrastructure-based barriers can be done through work with state agencies and/or Travel Nevada's destination development program.

When building your dark sky experience, it is important to identify the type of desired astrotourist you would like to welcome. The needs of specific, casual, and accidental astrotourists are different.

- ✦ Specific astrotourists will have a high understanding of astronomy and cultural

storytelling. They may have their own telescopes and cameras or will want access to them. They will want a tour guide with local knowledge of where to find the best photo opportunities or the best viewing locations.

- ✦ Casual astrotourists will want high-quality storytelling and scientific interpretation. They will want equipment to be provided or have access to rental equipment and have a higher probability of enjoying experience enhancements and amenities.
- ✦ Accidental astrotourists will be more likely to want their photo taken with the stars, or to purchase a tour or experience based on amenities and enhancements.

TOOLS & RESOURCES





USEFUL ARTICLES & RESOURCES

| Description | Link |
|---|---|
| Senate Bill 52 | leg.state.nv.us/App/NELIS/REL/81st2021/Bill/7230/Overview |
| What is Light Pollution? | darksky.org/resources/what-is-light-pollution/effects/safety |
| Light Pollution Waste | darksky.org/resources/what-is-light-pollution/effects/energy-climate |
| The Bortle Scale | telescope.live/blog/bortle-scale |
| Be a Good Neighbor | darksky.org/get-involved/home-lighting-assessment |
| How to Conduct a Night Sky Quality Reading | darksky.org/resources/guides-and-how-tos/how-to-conduct-a-night-sky-quality-survey |

Table continued on following page

Our desire to light our world at night is not new. We have illuminated our outdoor public places and private realms for centuries.

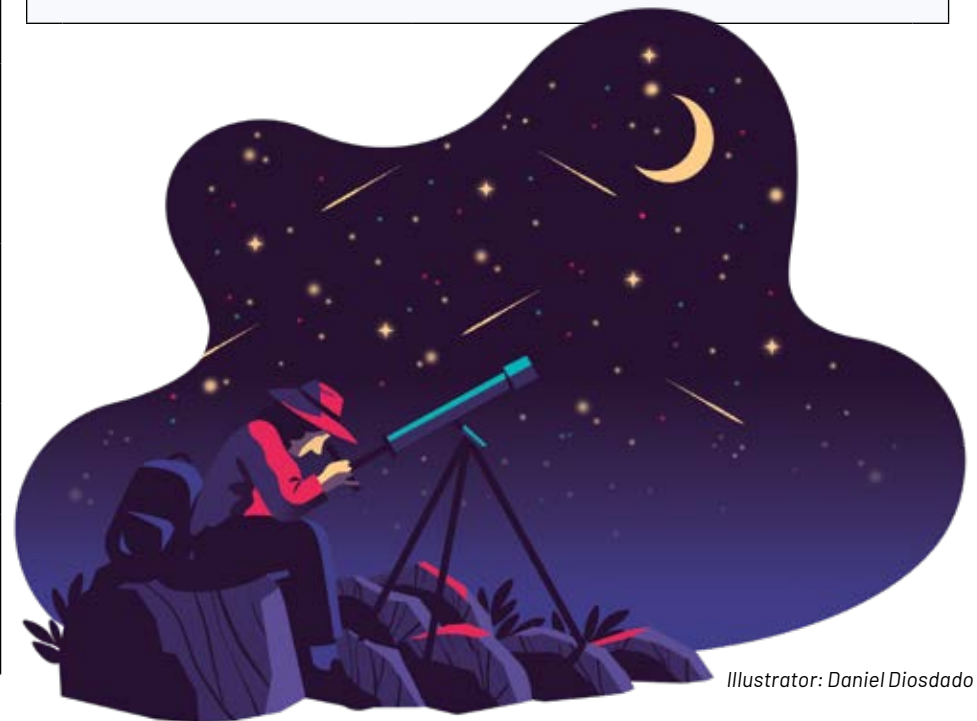
What has changed is that outdoor lighting is now ubiquitous, cheap, and powerful. With it, the world has gotten brighter. A lot brighter.

—DarkSky International

Useful Articles & Resources *(continued)*

| Description | Link |
|--|---|
| Light effects on pollinators and plants | fws.gov/story/2023-07/dim-lights-pollinators-and-plants-night |
| Great Basin National Park | darksky.org/places/great-basin-national-park-dark-sky-park |
| Create and design lighting zones | darksky.org/resources/guides-and-how-tos/lighting-zones |
| DarkSky Approved Lighting Products | darksky.org/what-we-do/darksky-approved/luminaires |
| American Medical Association | ama-assn.org/press-center/press-releases/ama-adopts-guidance-reduce-harm-high-intensity-street-lights |
| The Five Principles of Responsible Outdoor Lighting | darksky.org/resources/guides-and-how-tos/lighting-principles |
| Dark Sky Design | architecturalrecord.com/articles/11814-continuing-education-dark-sky-design |
| The Nevada Division of Outdoor Recreation NSSC | ndor.nv.gov/dark-skies |

| Description | Link |
|--|---|
| The Nevada Division of Outdoor Recreation Website | ndor.nv.gov |
| Travel Nevada | travelnevada.com |
| Light Pollution Map | lightpollutionmap.info |
| Dark Sky Friendly Home Certification | darksky.org/get-involved/home-lighting-assessment |



Illustrator: Daniel Diosdado

Common Terms



Talking about light and its impact on our world can sometimes feel overwhelming, especially with all the technical terms involved. To help you get started and provide a clear understanding, use the glossary of key terms below. This will serve as your baseline to navigate the concepts and terminology related to light pollution, dark skies, and night sky conservation best practices.

| Term | Description |
|--------------------------|---|
| Light Trespass | Light falling where it is not intended or needed |
| Glare | Excessive brightness that causes visual discomfort |
| Clutter | Bright, confusing, and excessive groups of light sources |
| Skyglow | Brightening of the night sky over inhabited areas |
| Adaptive Controls | Motion sensors, timers, and dimmers used in conjunction with outdoor lighting to reduce light pollution |
| ALAN | Artificial light at night |
| Artificial Light | Light produced by humans |

| Term | Description |
|--|---|
| Correlated Color Temperature (CCT) | A measure (in kelvins, K) of the warmth or coolness of the appearance of a light source. Light sources with a CCT of less than 3200 K are yellowish, pinkish, or orange-white in tone and considered “warm” in appearance. Light sources with a CCT greater than 4000 K are bluish-white and considered “cool” in appearance. |
| Naked-Eye Limiting Magnitude (NELM) | Magnitude of the faintest star an observer can discern under given sky conditions |
| Dark Sky | Denoting or located in a place where the darkness of the night sky is relatively free of interference from artificial light |
| Fully Shielded | A light fixture that allows no emission above a horizontal plane passing through the lowest, light-emitting part of the fixture |
| Lighting Zones | The five base (or ambient) light levels desired by a community |
| Lumen | A measure of the total flow of light from a lamp, luminaire, or other light source, without regard to its directionality |

Other Helpful Tools & Resources

ADVOCACY OR RESOURCE GROUPS

Basin and Range Dark Sky Cooperative

fws.gov/partner/basin-and-range-dark-sky-cooperative

DarkSky International

darksky.org

Friends of Nevada Wilderness

License Plate

nevadadarksky.org

Natural Sounds & Night Skies Division

nps.gov/subjects/nightskies/index.htm

EDUCATIONAL MATERIALS

Great Basin National Park Foundation

greatbasinfoundation.org

DarkSky International

darksky.org/resources/materials-for-educators

OBSERVATORIES

Great Basin Observatory

nps.gov/grba/learn/great-basin-observatory.htm

Fleischmann Planetarium

unr.edu/planetarium

Jack C. Observatory

wnc.edu/observatory.php

Dale Etheridge Observatory

csnplanetarium.square.site/

TOURISM RESOURCES

Great Basin Astronomy Festival

nps.gov/grba/planyourvisit/great-basin-astronomy-festival.htm

Travel Nevada Stargazing

travelnevada.com/stargazing

Park to Park in the Dark

parktoparkinthedark.org



Index of Photograph Locations *(stock photography not included)*

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| 2 | International Car Forest, Goldfield, NV | <i>Michael Okimoto</i> |
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