

General

- *Current information for the site IDA contact(s)*
- *Does the site currently have a Provisional status? If so, what work has been done in the past year to resolve concerns that resulted in the Provisional designation?*

Current contact: Nichole Andler, Chief of Interpretation

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The Lead Astronomy Ranger position is currently vacant, but the hiring process is underway.

We do not have a provisional status. We were granted gold-tier status in 2016.

Parks/Reserves

- *Does the site plan to apply for a tier status upgrade in the future? If so, what work has been done in the past year furthering the application?*
- *Estimate number of site visitors in the last year. Of those, how many participated in dark-skies programming?*

We do not have plans for a tier status upgrade.

GRBA's visitation continues to increase substantially each year. In 2016, Great Basin served approximately 145,000 visitors, and in 2017, our total visitation reached approximately 168,000. Between Sept. 29, 2017, and Oct. 6, 2018, at least 9,626 visitors attended astronomy programs. Our regularly scheduled programs cover a range of topics including: the ecological consequences of light pollution and methods of light pollution reduction, the likelihood of intelligent extraterrestrial life in our galaxy, the chronology of the universe and exoplanet detection, and the visible sky including constellations and stellar systems.

In 2018, we also offered a special program for the Perseid meteor shower, monthly full moon hikes, and monthly Star Train programs in cooperation with Nevada Northern Railway, which continue to sell out well in advance. Additionally, we offered regular solar telescope viewing utilizing the expertise of our dedicated returning volunteers. Our 9th annual three-day Astronomy Festival drew more than 2000 attendees of all ages who participated in a range of educational programs and telescope viewing opportunities.

Parks/Reserves

- *Were any new lighting projects completed this year? If so, describe.*
- *Is any lighting within the Park/Reserve non-compliant with the LMP (as permitted at the time of IDA designation)? If so, what is the plan to bring the remainder into compliance within the allowed window of time?*

- *Was any new territory added to the Park/Reserve? If so, does any lighting on it comply with the LMP? If lighting on new territory doesn't comply, is there a plan to bring it into compliance?*

The lighting at the Lehman Caves Visitor Center is currently red, and we continue to work towards assuring that all lights are in compliance. This will require adding more shielding to some fixtures, as well as continued maintenance and upkeep for treated light fixtures (those that are painted and/or colored with external red coverings).

We are aware that some lighting located in our Maintenance and Law Enforcement complex may not be compliant with IDA recommendations, and we are working towards solutions to these lighting problems. These light fixtures were installed prior to our dark sky park certification, but we will take appropriate steps to rectify this situation as soon as possible to protect our dark night skies.

A new program area dedicated to astronomy programs and night-sky viewing is in development, with plans included for night sky-friendly lighting. The date of completion is expected for September of 2020.

No new territory has been added to the park.

Communities

- *Were any changes made to local/municipal outdoor lighting policy in the past year? If so, describe and include text of any code language added or changed.*
- *Were there any new municipal lighting installations (or similar, large-scale installations on commercial property) built in the last year to show as examples built to your dark sky-friendly code?*

The local community in Baker, Nevada continues to be very supportive of the park's dark sky efforts. Local businesses promote educational opportunities in the park, and many work with us on lighting. Skyglow from Ely, NV can still be seen from parts of the park but is not overly intrusive. The Great Basin National Park Foundation's strategic plan includes plans to increase their advocacy for dark night skies in our local area over the next three years. Our suggestions to the Foundation include working directly with local businesses and establishments to retrofit existing light fixtures to comply with IDA's recommendations.

Sky Quality

- *Were sky quality data taken in the past year? If possible, include a table or figure showing the information*
- *Did sky brightness increase over the previous year? Decrease?*
- *Is a permanently mounted sky monitor installed, or are there plans to install one?*

No new sky quality data was taken by park staff this year, and we do not have a permanently mounted sky monitor, but we recently purchased a hand-held sky quality monitor for future use. A

representative from the NPS Natural Sounds and Night Skies Division visited GRBA in early September to collect sky quality data. Currently we are waiting for this data to be processed so we may make appropriate and informed decisions on how to improve our night skies.

Conservation and Research (Parks/Reserves)

- *Any ongoing conservation and/or research programs at the site? If so, who runs them, and what are the goals?*
- *Are there any new research results to report? Have any been published this year?*

The Great Basin Observatory was completed in 2016 and is currently being used for research. This 28-inch dome telescope is used by students and professors at our partner universities: Concordia University, University of Nevada at Reno, Western Nevada College, and Southern Utah University. (Because of the excellent darkness and sky quality here, a smaller and less expensive telescope can achieve a level of efficiency not possible in areas with greater light pollution.) One of the continuing research projects involves looking for exoplanets. The park communicates with these researchers and our partner foundation (Great Basin National Park Foundation), but the telescope is run remotely by university students and faculty. NPS staff have assisted with the resolution of minor technical problems that disrupt data collection. The online educational portal associated with the Great Basin Observatory went live in mid-May, 2018 (www.greatbasinobservatory.org), and provides a common space for educational resources and current research. Concordia University has published at least two papers using data produced by the GRBA observatory.

Funding

- *Currently administering any grants related to dark-skies programming? If so, describe.*
- *Were any new grants won this year?*
- *Are there plans to apply for any future grants?*

The park is not administering any new grants, and currently we do not have specific plans for future grants. The Great Basin National Park Foundation continues to fund astronomy equipment, repairs, and programming. The Western National Parks Association (WNPA) also provides funding across our interpretation division, some of which may be allocated to astronomy programs, equipment and supplies. WNPA also supports our Star Train program by donating educational prizes for winners of the Star Train trivia contests.

Arts and Culture

- *Is any programming ongoing or planned blending the arts/culture with dark skies? If so, describe.*

Schools from across the Great Basin, including Nevada, Utah, Oregon, and California, engaged their K-12 students in a GRBA-themed art project with the “Everyone Needs Darkness” motif. These pieces of art were displayed for several months in the Lehman Caves Visitor Center lobby and theater.

We also presented our traditional Ranger Talent Show during our annual Astronomy Festival, where all talents must relate at least tangentially to astronomy. This year’s show included original music, readings, and a constellation myth skit performed by astronomy and interpretation staff. Additionally, the festival offered a well-attended and recurring workshop on astrophotography.

The artists participating in our Artist-in-Residence program often take inspiration from various vistas, including our pristine night skies.

Outreach

- *Were any new outreach programs started this year?*
- *If so, are they complete or ongoing?*
- *Are statistics available (e.g., how many visitors served, donations, etc.)?*

The park cooperates with the Great Basin National Park Foundation to plan and execute outreach involving our new observatory. Our Geoscientist-in-the-Parks intern traveled to the public school in Garrison, UT, to provide an interpretive program focused on the sun and solar system. Students made a human model of our solar system, invented new planets, and looked through our solar telescope to view the sun.

The park ecologist worked with the Nevada Department of Transportation to install and assure the continual display of a scaled solar system model along the park entrance road.

During this year’s Astronomy Festival, we partnered with a PhD student from the Cosmic Ray Center in Delta, UT, to provide an educational presentation coupled with a demonstration on cosmic ray detection.

Community and Media Relations

- *Any new media coverage you would like us to know about? May include e.g., PDFs as attachments*
- *Any engagement with local governments, community organizations, or private landowners in the past year to report?*

Great Basin National Park was featured in a New York Times travel section article published on July 16, 2018, with references to the park’s pristine dark night skies.

LINK: <https://www.nytimes.com/2018/07/16/travel/great-basin-national-parks-least-visited.html>

Great Basin's Astronomy Festival was featured in three articles written and published by the Millard County (UT) Chronicle Progress. Our two guest speakers, Dr. John Barentine of the International Dark Sky Association, and Greg Furlich, PhD candidate from the University of Utah, were each featured in separate articles. The third article focused on festival activities and GRBA's general astronomy programs.

LINK: <http://millardccp.com/news/featured-local-news/3195-heard-of-light-pollution-keynote-speaker-of-great-basin-np-s-astronomy-festival-was-all-about-it>

LINK: <http://millardccp.com/news/featured-local-news/3214-phd-candidate-sheds-light-on-work-of-millard-county-cosmic-ray-observatory-that-s-largest-in-northern-hemisphere>

LINK: <http://millardccp.com/news/featured-local-news/3215-astronomy-festival-iso-interstellar-and-islam-oh-my>

One park astronomy ranger was interviewed for an upcoming article in the *National Parks Conservation Association* magazine.

Rangers at Lehman Caves Visitor Center were contacted and answered questions posed by a prospective author from *Frommer's Travel Guide* for an upcoming publication.

2018 Great Basin National Park IDA Annual Report written by:

Ian Brastow, Geoscientist-in-the-Parks intern

Becky Gillette, Park Ranger-Interpretation