

Obed Wild & Scenic River

International Dark Sky Park Application



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Prepared by
Ricky Ryan, Park Ranger
Obed Wild & Scenic River
June 2017

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IN REPLY REFER TO:
K1817

APR 13 2017

International Dark-Sky Association
Board of Directors
3225 North First Avenue
Tucson, AZ 85719

Dear IDA Board of Directors:

As a member nominator of the International Dark-Sky Association, and an Interpretive Ranger at the Obed Wild and Scenic River (WSR), it is with great enthusiasm that I nominate the Obed WSR, a unit of the National Park Service, for International Dark Sky Park designation.

We have prepared the enclosed application to present supporting information to demonstrate that the Obed WSR is a location possessing an exceptional dark sky resource that is deserving of recognition as an International Dark-Sky Association Dark Sky Park. Several sky quality meter surveys, with the most recent conducted in December 2016, indicate that the dark skies in the park fall within the silver tier status as contained in the International Dark-Sky Association Dark Sky Park Program Guidelines.

Our ongoing year-round interpretive programs and outreach efforts include a strong emphasis on preserving the park's dark sky conditions for present and future generations. In conducting these programs, we are supported through a strong collaboration with local astronomy organizations such as the Knoxville Observers and ORION Astronomy Club.

At the very core of our mission we are dedicated to preserving the river corridors of the park as a vestige of primitive America. In the 40 years since the park was created under the Wild and Scenic Rivers Act, this guiding principle has served to preserve the wildness of a landscape largely untouched by human hands. As a result, we have diligently avoided the installation of artificial light fixtures in the park. Not only are there no lights in the park, but there is no electricity.

We respectfully request your favorable consideration of this application. If you have any questions, please don't hesitate to contact me at (423) 346-6294. Thank you very much for your consideration.

Sincerely,

Ricky Ryan
Park Ranger, Interpretation
IDA Account #49082

United States Department of the Interior

NATIONAL PARK SERVICE
Big South Fork
National River and Recreation Area
Obed Wild and Scenic River
4564 Leatherwood Road
Oneida, TN 37841





IN REPLY REFER TO:
K1817

United States Department of the Interior



NATIONAL PARK SERVICE
Big South Fork
National River and Recreation Area
Obed Wild and Scenic River
4564 Leatherwood Road
Oneida, TN 37841

APR 13 2017

International Dark-Sky Association
Board of Directors
3225 North First Avenue
Tucson, AZ 85719

Dear IDA Board of Directors:

As the Superintendent of Obed Wild and Scenic River (WSR), I strongly support this nomination for International Dark Sky Park designation. The Obed Wild WSR is located only 30 miles from the outskirts of Knoxville, Tennessee, and yet it still offers visitors the opportunity to experience the beauty of dark night skies. A recent sky quality meter survey conducted in December 2016, as well as, two previous surveys conducted in 2013, all indicate that the park's dark skies fall within the silver tier status as contained in the International Dark-Sky Association (IDA) Dark Sky Park Program Guidelines.

From the Organic Act and National Park Service Management Policies to the park's Long Range Interpretive Plan, protection of the park's night skies is mandated at all levels of policy and guidance. Additionally, lightscape management is very simple at the Obed WSR. The park has no artificial light fixtures anywhere in the park and commits not to install such lights in the future. Indeed, the park's enabling legislation, the Wild and Scenic Rivers Act, mandates minimal development and the preservation of the primitive character of the park area.

Since 2013 the park has offered astronomy and dark sky interpretive programs with a strong emphasis on preserving our dark sky conditions for present and future generations. The park also commits to an ongoing dark sky monitoring program and to continue our ongoing outreach efforts to raise the awareness of the surrounding community regarding the importance of dark skies. These efforts will continue in collaboration with local conservation and astronomy groups.

The Obed WSR regularly promotes itself as one of the last vestiges of primitive America in the eastern U.S., and we are passionate about preserving our natural night skylines as well.

If you have any questions, please don't hesitate to contact me at (423) 569-9778. Thank you very much for your consideration.

Sincerely,

Niki Stephanie Nicholas, Ph.D.
Superintendent



Tennessee Valley Interstellar Workshop

May 4, 2017

International Dark-Sky Association
Board of Directors
3225 North First Avenue
Tucson, AZ 85719

Re: Obed Wild and Scenic River (WSR) Application for "International Dark Sky Park" Status

Dear Sirs:

The Board of the Tennessee Valley Interstellar Workshop supports the application of the Obed Wild and Scenic River (WSR) Site to be granted "International Dark Sky Park" status. We understand that their efforts in lighting control, including objective metrics, place them in the "silver" tier designation, no small achievement in this region.

We believe it is compatible with our educational outreach mission to support places where viewing the starry night sky is possible, as a stimulus to think and dream about the stars, and plan and pursue missions to reach such places.

We want to thank one of our collaborative organizations, ORION, Inc., for bringing this worthwhile endeavor to our attention.

Sincerely yours,

A handwritten signature in black ink, appearing to read "John F. Preston".

John F. Preston,
President, TVIW Inc.

P. O. Box 4171 Oak Ridge, TN 37831-4171 865-272-9151
www.tviw.us john.preston@tviv.us

International Dark-Sky Association
Board of Directors
3225 North First Avenue
Tucson, AZ 85719

To the IDA Board of Directors:

I am submitting this letter to strongly endorse International Dark-Sky Park designation for the Obed Wild and Scenic River (WSR).

I am president and director of the Oak Ridge Center for Risk Analysis and a former park ranger-naturalist for the National Park Service at Crater Lake, Zion, and Yosemite National Parks. I have conducted evening programs, including public star walks, at each of these major western national park locations. I have also volunteered to participate in and narrate night sky educational programs at Cades Cove in the Great Smoky Mountains National Park and at the Obed WSR. I find the Obed WSR to be an outstanding natural location from which to introduce park visitors from nearby urban and suburban areas to the wonders of a dark and starry night under a natural park setting devoid of local sources of light pollution. The interpretive, administrative, and law-enforcement staff at the Obed WSR have enthusiastically embraced the night sky as a natural and cross-cultural park resource worthy of protection and interpretation. Information about the undesirable effects of rapidly expanding light pollution is part of their educational program.

I take great personal pride in being part of the Obed WSR night sky program as a park volunteer. The WSR has recently purchased its own 12-inch Dobsonian telescope for use in night sky interpretation. To complement its professional staff, the Obed WSR has reached out to local astronomers like myself to assist as volunteers to share their knowledge and equipment with a most curious public. Night sky programs for the public have been scheduled by the Obed WSR several times a year. The Obed WSR is also in a partnership relationship with the local Tamke-Allan Observatory of Roane state Community College, near Harriman and Rockwood, TN.

The Obed WSR is indeed among the last vestiges of primitive America in the eastern USA and as such deserves recognition by the IDA as an International Dark Sky Park.

Please feel free to contact me if you have any questions. My direct telephone number is (865) 300-6183.

Sincerely,



F. Owen Hoffman, Ph.D.
President and Director

4/22/2017

IDA Board of Directors
International Dark-Sky Association
3225 North First Avenue
Tucson, Arizona 85719

Dear IDA Board of Directors,

It is with great enthusiasm that I nominate the Obed Wild & Scenic River area for an International Dark-Sky designation. At the very core of its mission the Obed is dedicated to preserving its river corridors as a "vestige of primitive America." In the 40 years since the park was created under the Wild and Scenic Rivers Act, this guiding principle of limited or no development has preserved the wildness of a landscape largely untouched by human hands. Because of this mindset, the park has been diligent in avoiding the installation of artificial lighting in the park. Not only are there no lights, there is no electric service!

The Obed Wild and Scenic River Area is located approximately 30 miles north of suburban Knoxville, TN and approximately 15 miles from Oak Ridge, TN, yet two different methods of assessing the park's dark sky quality survey using a Sky Quality Meter & Observable Sky Phenomena) yield results firmly in the middle of the "silver" tier designation, as established by the IDA. This, of course, qualifies as exceptionally dark for our region of the country. The Knoxville Observers are primarily a visual observing club with an emphasis on astro photography. We find it more challenging with every passing year to find and maintain viewing areas with such pristine conditions. Therefore we, along with two other local astronomy societies frequently resort to the Obed for star parties and other astronomy outreach events.

For years, the Obed has embraced its dark skies and the users who come to enjoy them. Park rules are written in such a way that visitors are encouraged to use the park's night skies. Frequent interpretive programs such as "Owl Prowls", astronomy walks and programs dedicated specifically to the importance of protecting our dark skies have become a staple to the park's educational offerings. The Obed Wild & Scenic River has also actively used social media such as Twitter and Facebook as well as its website to highlight the intricacies of its dark skies. Finally, the Obed Wild & Scenic River has committed to partnering with the Knoxville Observers and other local astronomy clubs to educate the surrounding communities in the importance of dark skies and what can be done to protect and maintain them.

On behalf of the Knoxville Observers Astronomy Club, I wholeheartedly endorse the designation of Dark-Sky Park status to the Obed Wild & Scenic River

Warm Regards,



Roger Lane, President
Knoxville Observers Astronomy Club

April 24, 2017

International Dark-Sky Association
Board of Directors
3225 North First Avenue
Tucson, AZ. 85749

Dear Board of Directors

I would like to express my support for the "Obed Wild and Scenic River" Dark Sky designation.

As a seventy three year old amateur astronomer living twenty five miles from the park, I have found it to be one of the darkest (if not the darkest) areas that I have access to. I along with other area amateur astronomers have participated in several park sponsored astronomy outreach programs for the Park Visitors and the local residents. These programs have had very good visitor participation and I am sure that many have gained a greater awareness and appreciation for dark skies in the park and the wonders of astronomy. The park staff have been enthusiastically promoting dark sky awareness and preserving and reclaiming the dark skies in the park.

I and other amateur astronomers have also held several viewing sessions in the park independent of the park sponsored events. It is a great place to view the night sky.

Again I would like to support the application for Dark Sky designation for the "Obed Wild and Scenic River" Park. I hope that the Board of Directors approves their application.

Sincerely



Karl Gerth
Oak Ridge TN,
karlgerth@aol.com

7504 Glastonbury Road
Knoxville, TN 37931
April 25, 2017

International Dark-Sky Association
Board of Directors
3225 North First Avenue
Tucson, AZ 85719

Dear IDA Board of Directors:

As a life-long amateur astronomer, I strongly support the nomination of the Obed Wild and Scenic River (OWSR) for International Dark Sky Park designation. The OWSR's location is a double blessing. It is remote enough to give it dark skies and minimal light pollution while being nearby to population centers to allow access by the general population to enjoy those dark skies. There are two excellent observing areas in OWSR - Lily Bluff Overlook with an almost 360 degree vista and Nemo Bridge with an excellent view to the south shielded by ridges to the east, north, and west.

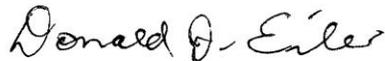
The staff of OWSR is extremely enthusiastic about sharing the river's dark skies. I have participated in four star parties directed by them with great success. Their organizational, communication, and implementation skills have been excellent. Public interest and response have been very gratifying. The staff's hands-on assistance to the amateur astronomers with their observing equipment has been invaluable. Moreover, the staff has applied for and received a grant for a 12" Dobsonian for public viewing. This scope has been deployed twice in recent months for use in conjunction with other amateur instruments.

The staff has developed a very strong working relationship with local amateur astronomers to support the outreach mission of the OWSR. We are very fortunate to have the support of Dr. Owen Hoffman, a former National Park Service scientist. Owen has a vast knowledge of the night sky and has an incredible talent for sharing it with the public. He has also assisted the OWSR staff with technical details of their outreach program.

I can see only mutual benefit for the National Park Service and the International Dark-Sky Association for designation of OWSR as an International Dark Sky Park.

If I can provide additional information, please contact me at 865-947-9359 or eilers2@comcast.net.

Sincerely yours,



Donald J. Eiler, P.E.

FROM THE DESK OF

BILL M CAMPBELL MD FAWM DIMM

May 11, 2017

International Dark-Sky Association
Board of Directors
3225 North First Avenue
Tuscon, AZ. 85719

Dear IDA Board of Directors:

I am writing in support of the nomination of Obed Wild and Scenic River for a designation as an International Dark Sky Park. This National Park Unit is a boon for photographers like myself to enjoy the dark sky and the concomitant view of the heavens.

As a professional nature photographer, I have photographed night skies all over the world. I am always excited to tell people that I have a place very close to home that I can go to when I want to view the stars or photograph astronomical events. The conditions are great and night sky viewing is only dependent on weather factors and not limitations from light pollution.

I would love to see the Park receive this designation so it will become more visible to the public interested in dark sky viewing.

Sincerely yours,



Bill M Campbell MD, FAWM DiMM

Past President North American Nature Photography Association

106 CANTERBURY ROAD OAK RIDGE, TN 37830 (865) 805-9142



May 3, 2017

International Dark-Sky Association
Board of Directors
3225 North First Avenue
Tucson, AZ 85719

Re: Obed Wild and Scenic River (WSR) Application for "International Dark Sky Park"

Sirs,

I am most delighted to support the application of our nearby Obed Wild and Scenic River (WSR) Site to be granted "International Dark Sky Park" status. I've participated in astronomy events at WSR on several occasions, and their beautiful and unique site is a quality viewing area for those of us in the eastern part of the country. Their attention to lighting control as well as objective measures of lighting place them in the "silver" tier designation, which is exceptionally good by our corrupted 'eastern' viewing standards.

This beauty, the exceptional primitive unspoiled quality of their site, and the beauty of their sky place them ahead of all other local facilities, yet they are still not so distant as to be unused. Their interpretive programs are well-planned and implemented and they serve the public exceptionally well.

They also deserve commendation for partnering with our observatory and with our local astronomy clubs. Both the ORION and Knoxville Observer groups have greatly enjoyed our visits to the Obed. The Obed WSR supports scout and student activities as well.

Please accept this recommendation as an invitation to visit and enjoy the Obed WSR and to visit us at Tamke-Allan Observatory. Consider it also an endorsement of your work to return Clear Dark Skies and preserve the beautiful nighttime environment – our greatest park!

Best,

A handwritten signature in blue ink that reads "David E. Fields".

David E. Fields, PhD
Director, Tamke-Allan Observatory
Roane State Community College

and

Director
ORION, Inc. [Oak Ridge Isochronous Observation Network]

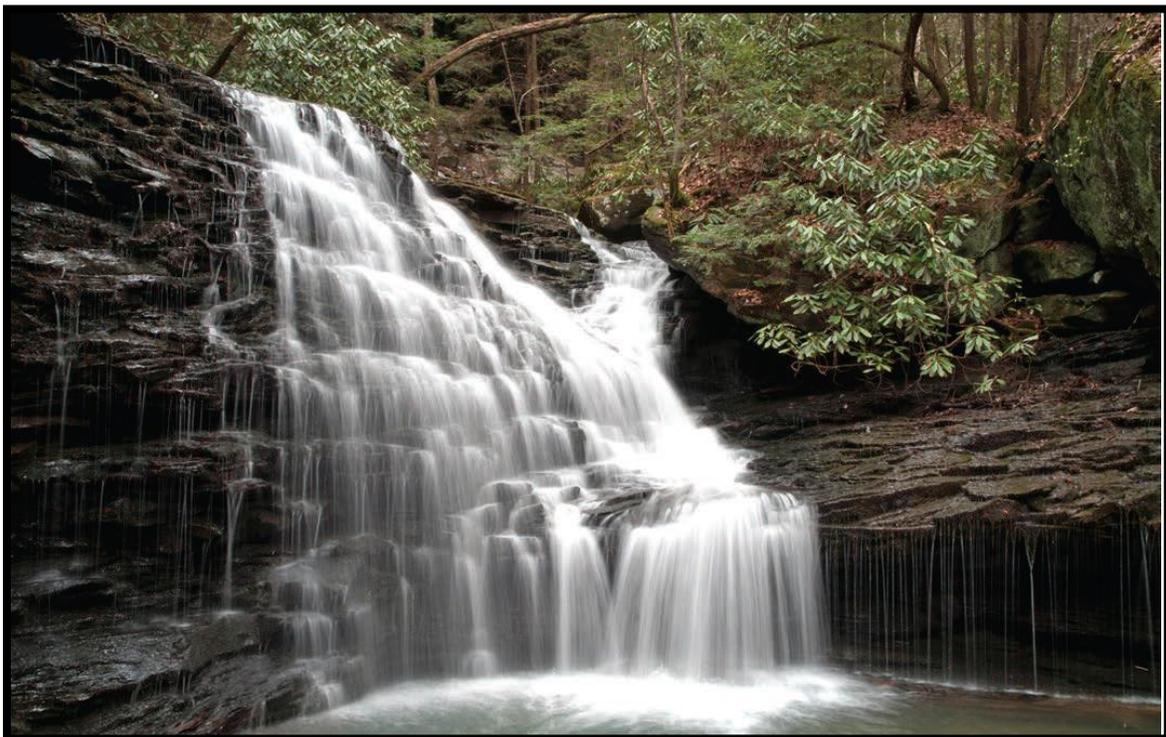
I. Purpose

The purpose of this application to the International Dark-Sky Association (IDA) is to present supporting information to demonstrate that the Obed Wild and Scenic River (Obed WSR), a unit of the National Park Service, is a location possessing an exceptional dark sky resource that is deserving of recognition as an IDA Dark Sky Park (DSP). The ongoing goal of the Obed WSR is to preserve this night sky resource for the enjoyment, education, and inspiration of present and future generations, which is consistent with the IDA's goals for DSP creation.

II. Park Background

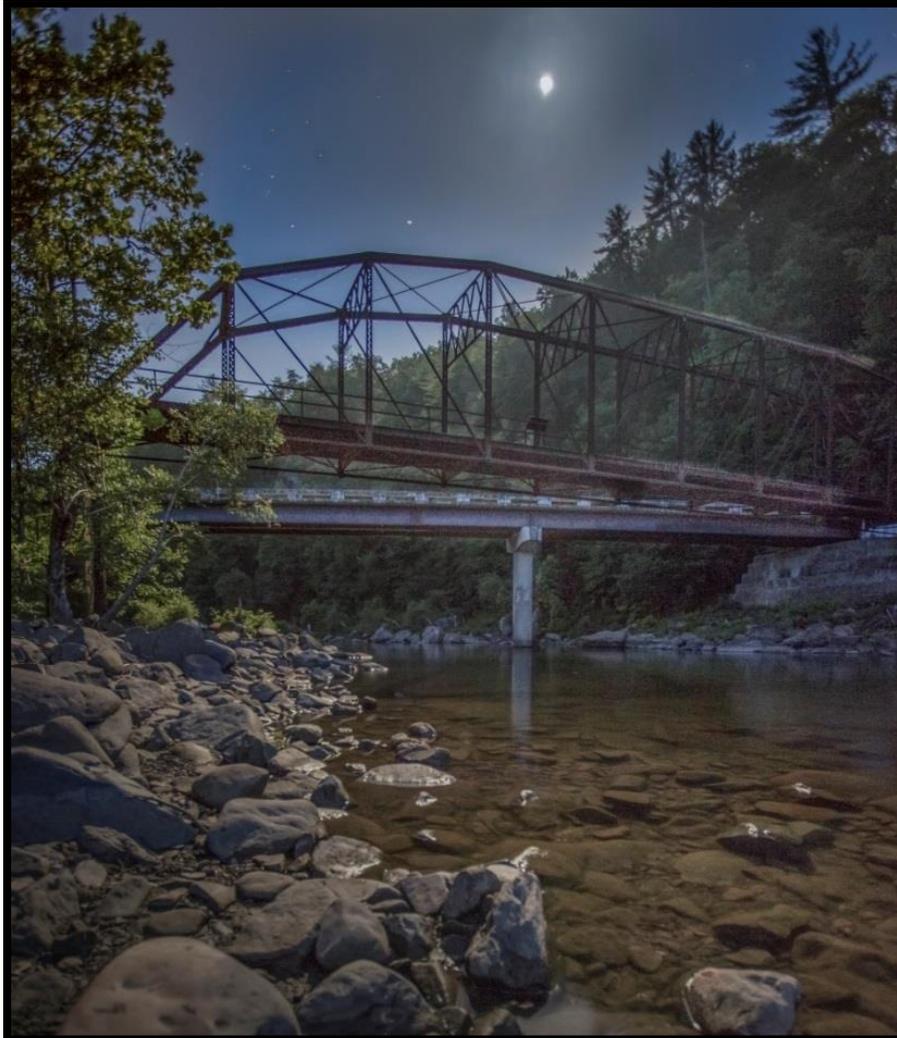
The Obed WSR was established in 1976 to preserve one of the last free-flowing wild river systems in the Eastern United States. The park is located within Morgan and Cumberland Counties on the Cumberland Plateau in north-central Tennessee. Existing boundaries encompass over 5,000 acres including portions of the waters, stream bed and lands adjoining 45.2 miles of the Emory River, Obed River, Clear Creek and Daddys Creek. The park is composed of a relatively narrow, branching river corridor, adjoined in part by the Catoosa Wildlife Management Area, an 82,000-acre wildlife preserve managed by the State of Tennessee.

The quantity and quality of waters in the park sustain and nourish a rich variety of species, as do the surrounding forests and other ecosystems. The park's deep sandstone gorges offer world-class recreational opportunities in pristine, visually stunning surroundings. Rugged terrain has caused the river corridor to remain uninhabited, and much of the park looks the same today as when the first long-hunters and settlers strolled its banks in the late 1700s.



Melton Mill Branch Falls

The park is located within a short driving distance from several nearby communities. For example, Wartburg and Crossville, the seats of Morgan and Cumberland Counties respectively, are located near the park. Other larger towns include Oak Ridge (a 45 minute drive from the park), Knoxville (a one hour drive from the park), and Nashville (a two hour drive from the park).

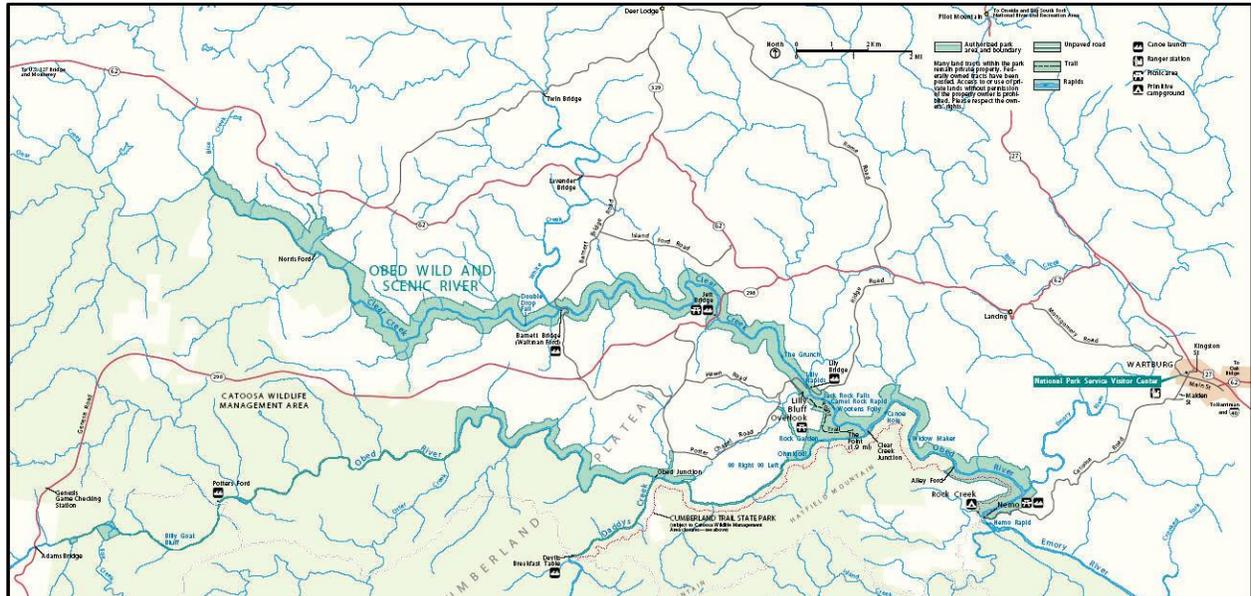


Nemo Bridge at Night

Recreational activities are enjoyed by visitors year round throughout the entire area of the park, which is free and open to the public both day and night. These activities include rock climbing, whitewater paddling, hiking, fishing, and camping. Visitors can enjoy over 20 miles of hiking trails in the park, and participate in a wide variety of interpretive programs to include night sky programs. The Lilly Bluff overlook presents a stunning view of the Clear Creek gorge from a boardwalk located at the rim of the gorge. The historic Nemo Bridge, now a pedestrian bridge located over the Emory River offers an up-close and personal experience with a free-flowing river. Both locations are very popular for visitation, and both are an integral part of our night sky programs where we set up telescopes for viewing by the public. Located nearby Nemo Bridge is

the park’s Rock Creek Campground with 11 sites that are open all year to the public. In addition, backcountry camping is available throughout the park.

The entire area of the Obed Wild and Scenic River, as depicted in dark green on the map below, is proposed for designation as an International Dark Sky Park.



III. Management Documents and Guidance Governing Dark Sky Preservation

National Park Service Organic Act

The 1916 NPS Organic Act created the U.S. National Park Service and still serves as the agency’s foundation for conservation. Among its purposes is scenic preservation, which includes dark sky resources and the mandate to keep them unimpaired for future generations. “The service thus established shall promote and regulate the use of the Federal areas known as national parks, monuments, and reservations hereinafter specified by such means and measures as conform to the fundamental purpose of the said parks, monuments, and reservations, which purpose is to conserve the scenery and the natural and historic objects and the wildlife therein and to provide for the enjoyment of the same in such manner and by such means as will leave them unimpaired for the enjoyment of future generations.”

Wild and Scenic Rivers Act

The Obed Wild and Scenic River was established through an October 12, 1976 amendment to the Wild and Scenic Rivers Act of 1968 (Public Laws 90-541 and 94-486). The goal of the Act was to ensure that “certain selected rivers of the Nation which, with their immediate environments, possess outstandingly remarkable scenic, recreational, geologic, fish and wildlife, historic, cultural, or other similar values, shall be preserved in free-flowing condition, and that they and their immediate environments shall be protected for the benefit and enjoyment of present and future generations.” “Wild rivers” under the act “represent vestiges of primitive America” and

the primary emphasis of protection shall be “protecting...aesthetic, scenic, historic, archeologic, and scientific features.”

NPS Management Policies 2006

This volume of NPS Management Policies is the basic Service-wide policy document of the U.S. National Park Service. It is designed to provide NPS management and staff with required and/or recommended actions to help manage parks and programs effectively.

4.1.4 Partnerships

“The Service will seek the cooperation of others in minimizing the impacts of influences originating outside parks by controlling noise and artificial lighting...”

4.10 Lightscape Management

“The Service will preserve, to the greatest extent possible, the natural lightscape of parks, which are natural resources and values that exist in the absence of human caused light...” “The stars, planets, and earth’s moon that are visible during clear nights influence humans and many other species of animals, such as birds that navigate by the stars or prey animals that reduce their activities during moonlit nights.”

9.3.1.4 Amphitheaters

“Artificial lighting must be carefully directed and kept to a minimum, with due regard for natural night sky conditions.”

9.3.2.1 Campgrounds

“Lighting will be energy efficient and shielded as much as possible so that visitors have the opportunity to experience the natural darkness and night skies.”



Obed Wild and Scenic River General Management Plan

According to the park’s 1995 General Management Plan (GMP), the purpose of the Obed Wild and Scenic River is to “preserve and protect the Obed Wild and Scenic River System and the surrounding area... for the benefit and enjoyment of present and future generations.” The GMP points out that “...development within the boundaries is restricted by the Wild and Scenic Rivers legislation.” The GMP states that the “desired future condition” is one in which the “primitive nature of the river corridor is being protected. Visitors are experiencing a vestige of primitive

America—essentially primitive shorelines and unpolluted waters—by floating the river, viewing the river and gorge, hiking on trails, and camping along the river and trails without intrusion by motor vehicles or developments.”



Star Trails from Lilly Bluff Overlook

Obed Wild and Scenic River Long Range Interpretive Plan

According to the park’s 2003 Long Range Interpretive Plan (LRIP), one of the park’s primary interpretive theme’s is that “[t]he natural mosaic of the Obed is an increasingly rare window into America’s past.” According to the LRIP, the goal of this theme is “to reconnect life and nature by discussing the value of quiet, solitude, and even darkness in the noisy, frenetic, and developed world of the 21st century.”

Obed Wild and Scenic River Foundation Document

According to the park’s 2015 Foundation Document, fundamental resources have been identified which warrant primary consideration during planning and management processes because they are essential to maintaining the significance of the park. Included among these fundamental resources is the park’s connection to a primal landscape, where dark night skies and clean air allow visitors to enjoy wilderness-like encounters with the stars, and experience an array of natural sounds such as the chorus of insects and frogs on a summer night.

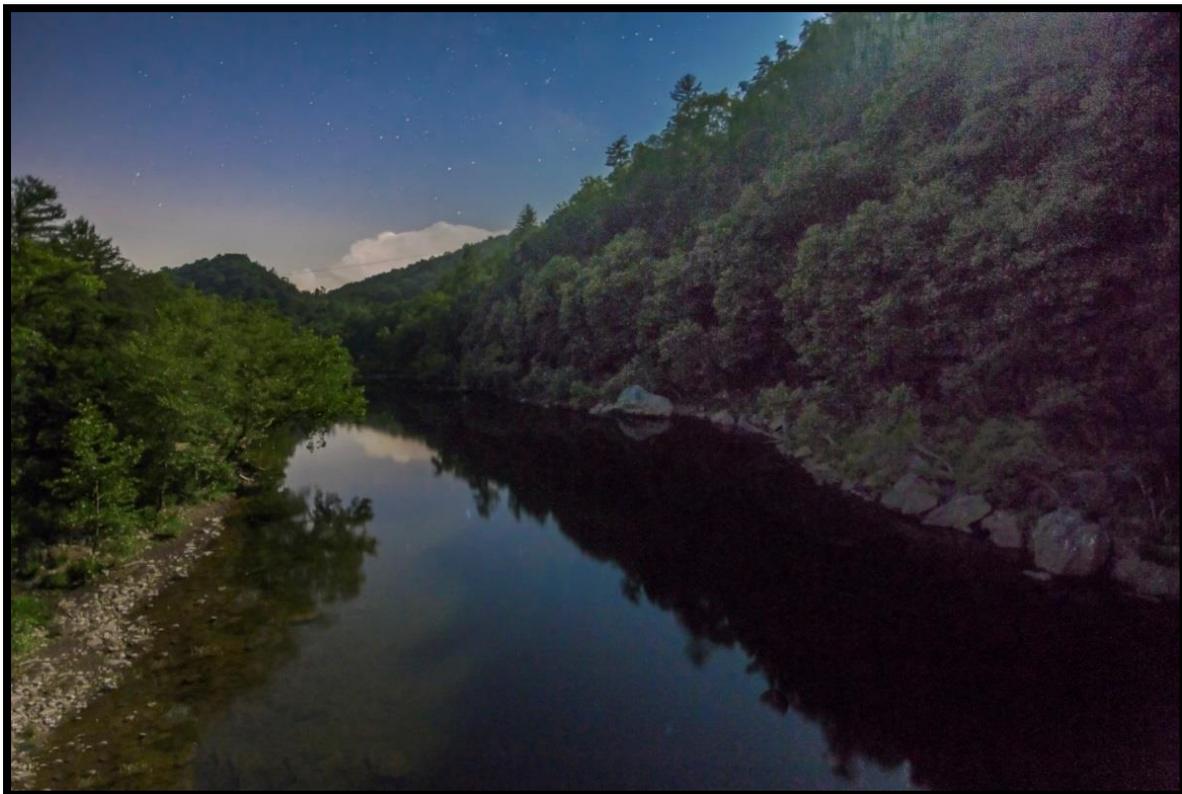
Conclusion

Taken together, the laws, policies, plans, and documents which provide the guiding framework for the park make it clear that the protection of the park’s dark skies is imperative. The park is committed to preserving its river corridors as a “vestige of primitive America,” and this commitment to non-development has the necessary corollaries of avoiding the introduction of artificial light sources into the park area and of working to educate the surrounding communities to promote stewardship for the area’s dark night sky.

IV. Lightscape Management

As described above, preserving the park in its primitive condition is at the core of the park's mission. Because of this, there are no artificial light fixtures anywhere in the park, including the private land held within the park boundary. The park has five semi-developed access areas. All of these accesses have parking areas and pit toilets. Three of them also feature picnic tables and metal fire pits. None of the five is lighted at night because the installation of artificial lights in these areas would be inconsistent with the Wild and Scenic Rivers Act and other guiding documents which mandate the preservation of the primitive character of the park area.

While there are currently no county-level lighting policies that exist in the areas in which the park is located, it is the policy of the park that permanently installed outdoor lighting is prohibited in the future, as documented in the Superintendent's Standard Operating Procedure (SOP) B-9: Prohibition of Permanently Installed Outdoor Lighting (Attachment 1). This SOP, which is binding park policy, functions equivalently as a resource management plan for the park's night sky resource, and stands as the park's Lightscape Management Plan because it implicitly meets all the requirements of the IDA DSP Program Guidelines. While the SOP allows for temporary installations of lighting that may be needed in emergency and other temporary situations, it also stipulates that the park will make every reasonable effort to limit the duration, intensity, and color of the light to minimize its impacts on dark sky conditions.



V. Dark Sky Quality

The Obed Wild and Scenic River is located approximately 30 miles in a straight line from suburban Knoxville and approximately 15 miles from the town of Oak Ridge. Assessments of the park’s dark sky quality were conducted initially in November 2013, and more recently in December 2016, with both assessments yielding “silver” tier levels, as established by the International Dark-Sky Association.

The exceptional quality of the starry night sky in the park makes it an attractive location for astronomers and visitors. Astronomy clubs from Knoxville and Oak Ridge (the Knoxville Observers and the ORION Astronomy Club respectively) frequently visit the park area for night sky viewing. And stargazing is a frequent activity among park visitors with year-round night sky programs offered by our park staff. A survey conducted in the Fall of 2012 by the Park Studies Unit of the University of Idaho found that 75% of park visitors consider the protection of night skies at the Obed Wild and Scenic River either “extremely important” or “very important.”

Regional Sources Light Pollution

As shown below, the Obed Wild and Scenic River is one of the few areas in Tennessee that still exhibits dark-sky conditions. Most of Tennessee is in warmer-colored sections due to the high population in urban areas. The pin-flag on the figure below represents the central location of the park and shows that the park is located in a dark-sky area. The park is far enough away from the metropolitan areas of Crossville, Oak Ridge, and Knoxville that there is minimal light pollution from these areas.

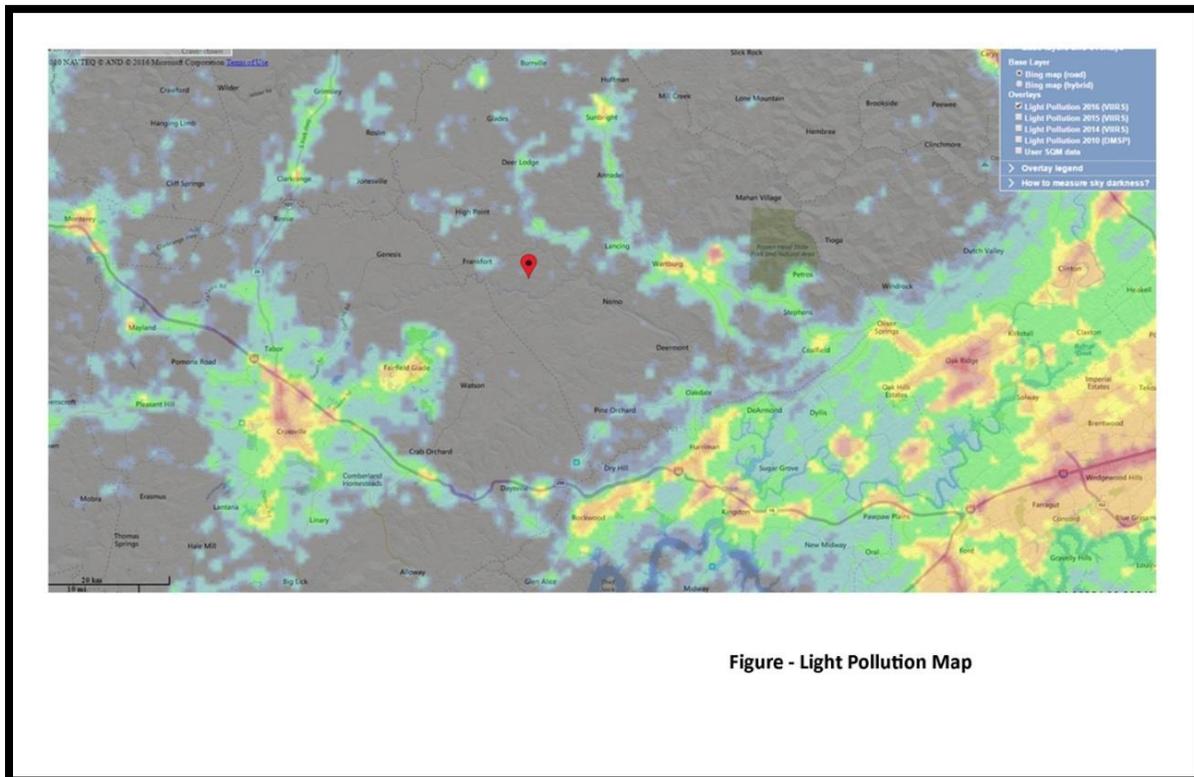


Figure - Light Pollution Map

Below are two horizon photos taken at Lilly Overlook in the direction of Wartburg, which is the closest nearby town to the park. The photos show that this light dome from the nearest town is minimal and low to the horizon. And is a visual validation of the sky quality meter measurements presented below.



Horizon Photo from Lilly Overlook Looking Towards Wartburg



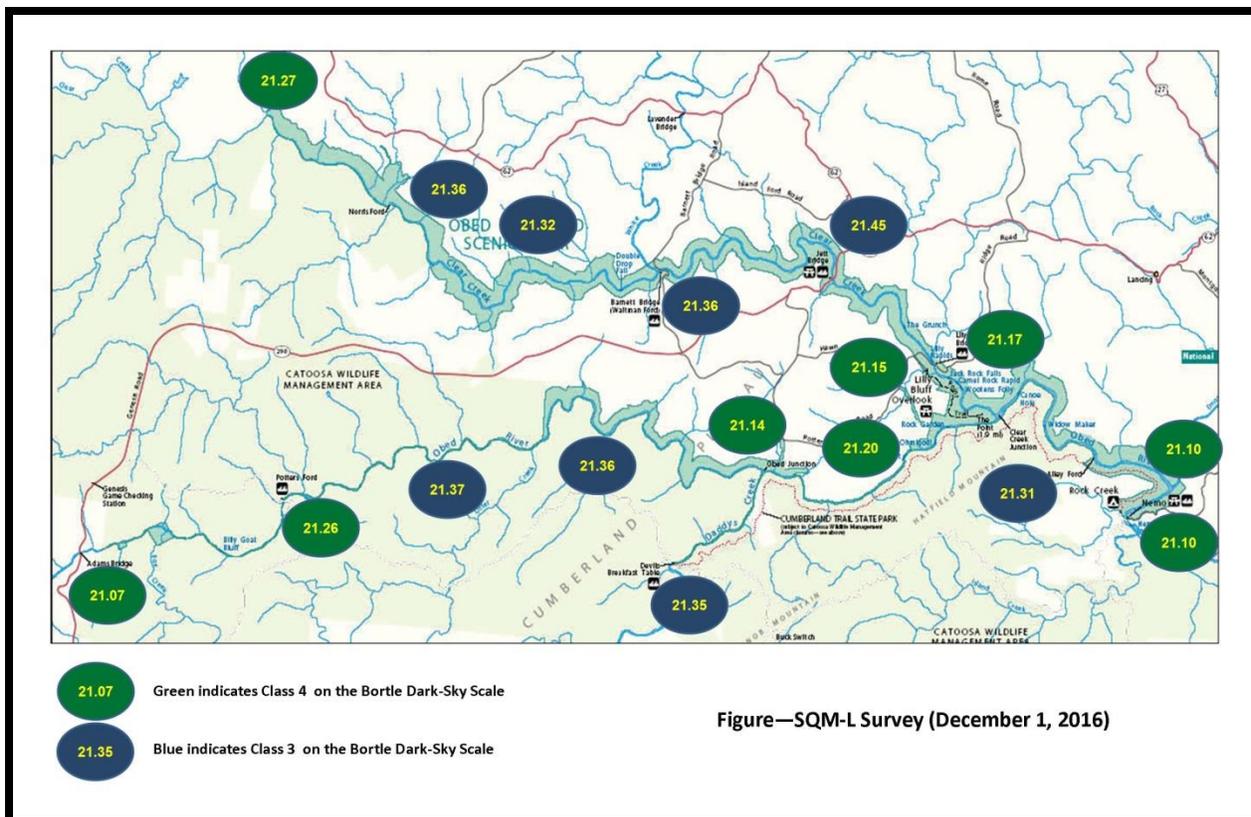
Horizon Photo from Lilly Overlook Looking Towards Wartburg (slightly off-set)

Sky Quality Meter Surveys

The most recent sky quality survey was conducted in December 2016 on a clear moonless night using a Sky Quality Meter (SQM-L) from Unihedron to measure the brightness of the sky at the zenith from 17 locations. In accordance with the SQM-L instructions the meter was pointed at the unobstructed zenith in each given location, and the first reading was discarded, and the next three readings were averaged to determine a representative reading for each location.

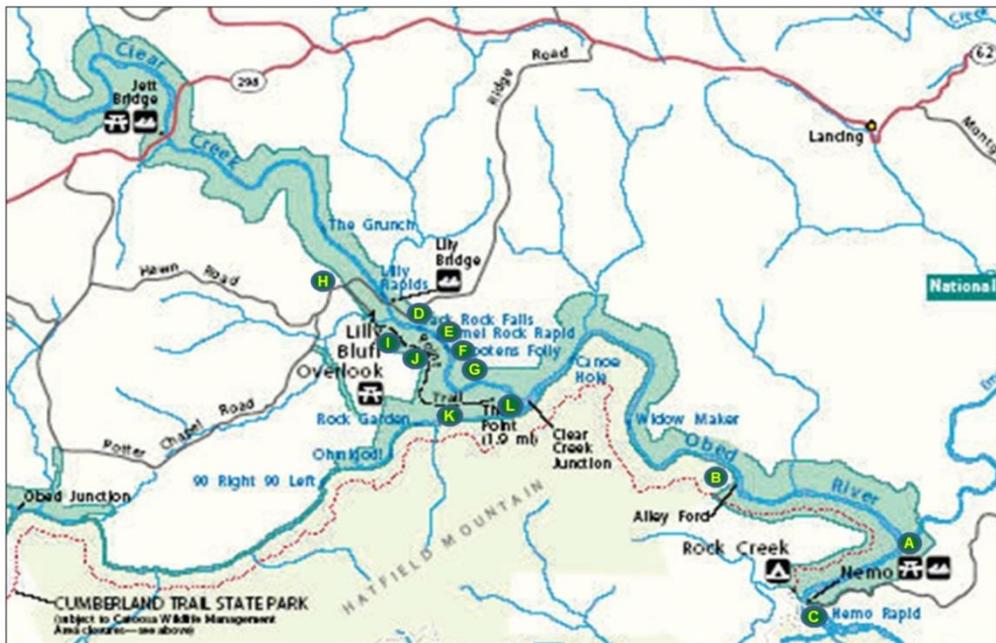
While previous surveys were conducted in limited areas of the park, the December 2016 survey included the entire area of the park. The table below and corresponding figure depict the results from the December 2016 survey, with readings expressed in magnitudes per arc second squared. Consistent with the readings from previous surveys, all readings taken in the December 2016 survey fell within the silver tier level (between 21.00 and 21.75) under the IDA DSP designation guidelines.

SQM-L Survey (December 1, 2016)	
Location	Result
Alley Ford Riverside	21.31
Nemo Bridge	21.10
Emory River at Fork Hole	21.10
Lilly Bridge	21.17
Lilly Overlook	21.15
Laz Hawn Road Field	21.20
Obed Junction Field	21.14
Jett Bridge Picnic Area	21.45
Devil's Breakfast Table	21.35
Field in CWMA	21.36
Field towards mouth of Otter Creek	21.37
Potter's Ford	21.26
Adams Bridge	21.07
Barnett Bridge	21.36
Four Mile Creek gate	21.32
Scott Wyatt Road	21.36
Loyd Hall Loop gate	21.27



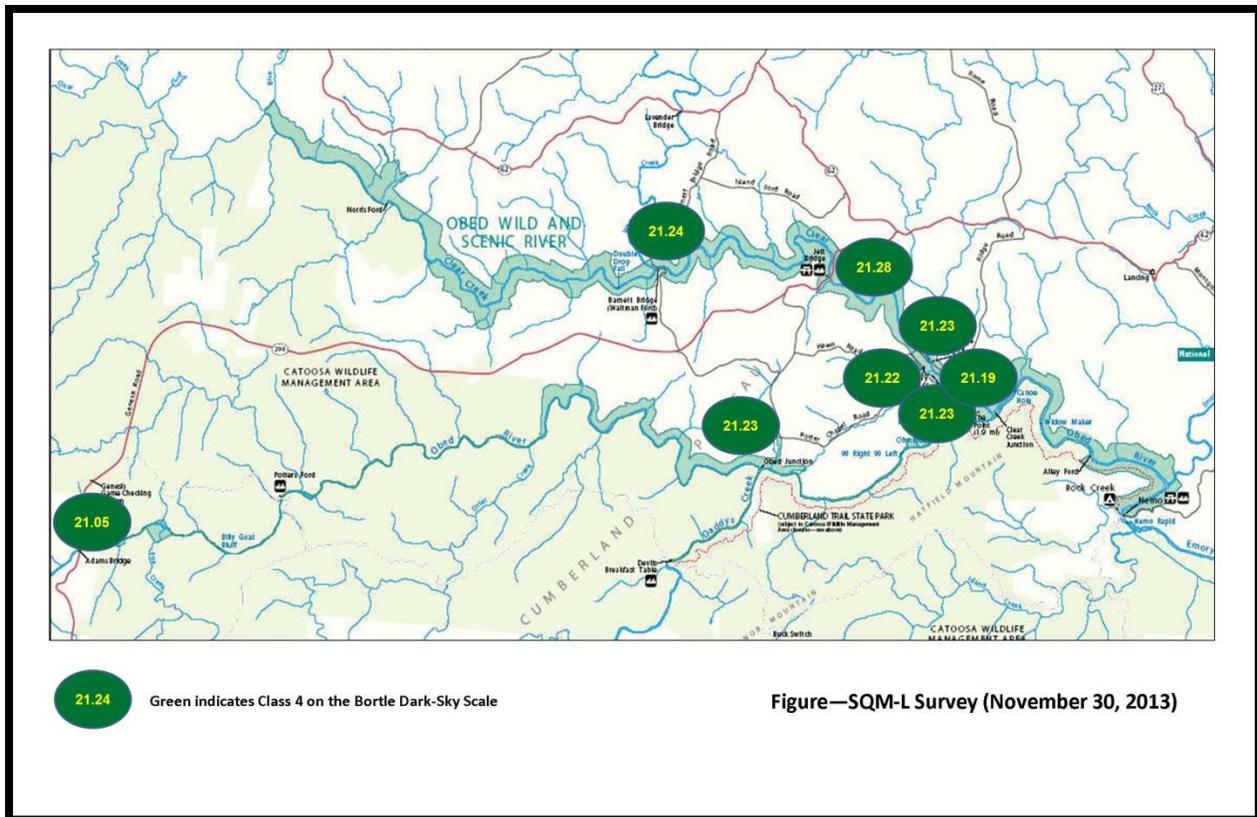
Two previous surveys were conducted in November 2013, also on clear moonless nights using an SQM-L to measure the brightness of the sky at the zenith from twenty points throughout the park. The tables below and corresponding figures depict the results from the November 2013 surveys, with readings expressed in magnitudes per arc second squared.

SQM-L Survey (November 3, 2013)	
Location	Result
A - Emory River at Fork Hole	21.16
B - Alley Ford Riverside	21.13
C - Nemo Bridge	21.11
D - Inner Circle Overlook	21.12
E - Camel Rock Overlook	21.10
F - Great Roof Overlook	21.08
G - Clear Cut near trail	21.08
H - Back Overlook Parking Lot	21.10
I - Y12 Overlook	21.07
J - Point Trail Overlook	21.08
K - Arch Overlook	21.08
L - End of Point Trail	21.08



Figure—SQM-L Survey (November 3, 2013)

SQM-L Survey (November 30, 2013)	
Location	Result
Doc Howard Parking Lot	21.19
Lilly Bridge	21.23
Front Overlook Parking Lot	21.22
Obed Junction Field	21.23
Adams Bridge	21.05
Barnett Bridge	21.24
Jett Bridge Picnic Area	21.28
Lilly Overlook	21.23



All locations from all three surveys in 2013 and 2016 demonstrate that the entire area of the Obed WSR falls within the silver tier level under the IDA DSP designation guidelines. The locations within the interior portions of the park, which are the furthest away from the towns of Wartburg and Crossville exhibit the darkest results, however all locations meet the silver tier criteria. The primary viewing locations for the park’s night sky viewing programs at Lilly Bluff Overlook and Nemo Bridge fall in the lower end of the silver tier range, however they still offer great visibility of the Milky Way, stars, and meteors. The 2016 survey represents the most comprehensive survey of the park and the results are representative of the entire area of the park. Further, they show that the park has maintained silver tier levels from the initial survey in 2013 until the most recent survey in 2016.

The responsibility for collecting future SQM data annually for inclusion in the park’s annual reports to the IDA following DSP designation will be conducted by Obed WSR staff with the Division of Interpretation and Education serving as the primary point of contact.

VI. Dark Sky Interpretation and Outreach

The Obed Wild and Scenic River has a night sky where visitors can still enjoy the splendor of the Milky Way and see a night-sky strewn with an abundance of stars with only the naked eye. In 2016, the park launched a Dark Sky Initiative, consistent with the National Park Service Director’s Call to Action item “Starry, Starry Night”. Early in 2016, the Obed Wild and Scenic River received a \$3,000 competitive grant from Eastern National for the park’s dark sky and

astronomy programs. The grant enabled the park to purchase a Dobsonian reflector telescope with a 12-inch parabolic primary mirror, complemented with specialized eyepieces and accessories.

Interpretive Programs and Community Outreach

With an overall goal of promoting education and stewardship for night sky resources, the staff of the Obed Wild and Scenic River has offered astronomy and dark sky interpretive programs to the public since 2013 with a strong emphasis on preserving our dark sky conditions for present and future generations. The Obed continues to be supported in its efforts through a strong collaboration with local astronomers from the ORION astronomy club in Oak Ridge, TN and the Knoxville Observers in Knoxville, TN.

In the past year, eight night sky interpretive programs were conducted both within the park, as well as, out in the local community. Night Sky programs in the park included astronomy events at the Lilly Bluff Overlook above the Clear Creek River Gorge, the historic Nemo Bridge over the



Emory River, and the NPS Visitor Center in Crossville. Attendance at the events has increased significantly over previous years with the attendance at some programs approaching 100 participants. Programs in the community included an astronomy program for a middle- and high-school youth group, a comprehensive program (including the park's night sky resource) for the Toqua District of the Boy Scouts of America, and a program on the park's night sky resource held at the Tamke-Allen Observatory in Rockwood, TN.

In conjunction with local media publicity of special astronomical events such as the "Super Moon" the park has held events to offer the public viewing opportunities through the newly purchased NPS telescope and has used smart phone mounts to allow the public to take their own pictures of the cratered surface of the full moon. These programs and outreach events will continue, with continued night sky programs at



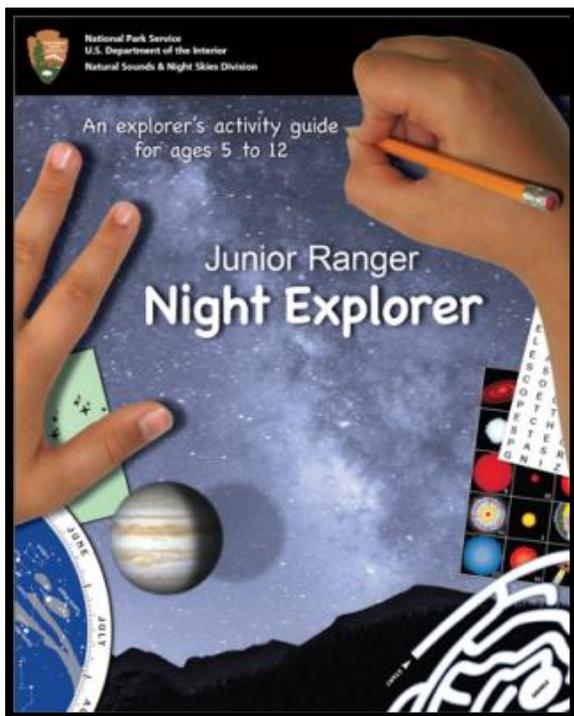
Lilly Bluff overlook and Nemo Bridge, and presentations to community groups such as the Bearden Rotary Club in Knoxville scheduled for the upcoming months.

Other programs have included an emphasis on owls and night sounds, as well as, naked-eye astronomy, the critical importance of dark skies to the animals in the park, and the importance of dark skies to human happiness and well-being. All programs have included a discussion of the threats of light pollution on our dark sky resource, as well as, specific references to the International Dark-Sky Association and the park's efforts toward certification as a DSP, including the park's SQM-L survey results and what they mean in the context of DSP designation. Related topics have included the importance of efficient lighting and safety-related myths connected with over-lighting. All programs were promoted through press releases to a wide range of newspaper, radio, television, and social media outlets.



Night Explorer Junior Ranger Program

The park's grant funds were also used to offer a new youth-focused night sky activity; the National Park Service's Junior Ranger Night Explorer program, an activity guide for youth ages 5-12 to encourage young visitors to explore the "dark side" of their park. Completion of the activity book is rewarded with a unique patch. The program booklets are available at all Night Sky Programs and in the park visitor center.



Social Media and Other Media

The park has a very active presence on both Facebook and Twitter, and has promoted our night sky programs in these venues. These social media platforms are used to not only promote the park's night sky events, but also allow a venue for public feedback and discussion prior to and following the event. In addition to posting park-specific events, these social media platforms are used to "like" the Facebook pages of other organizations that promote dark sky awareness and stewardship, including the International Dark-Sky Association, Tamke-Allen Observatory, and the local astronomy clubs.

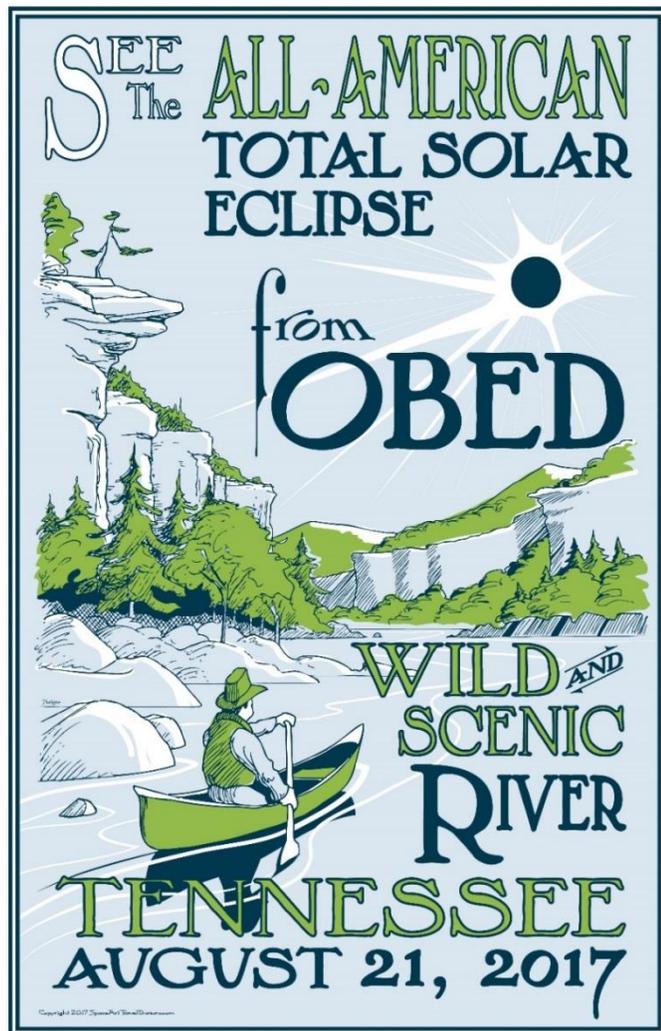
An award-winning park movie is shown in the park visitor center and sold in the park bookstore. The movie was recognized by the National Association of Interpretation in 2014 for "sharing an intimate portrayal of the visitors' deep connections with the park." The movie is also used in the park's outreach and education programs. Through stunning night-time visual imagery, this movie highlights the beauty of the park's dark skies and the importance of protecting them.

In the past year, the park's night sky program activities have been written about in the Knoxville Mercury (<http://www.knoxmercury.com/2016/11/22/getting-good-view-supermoon-obed-wild-scenic-river/>) and the National Parks Traveler Magazine (<http://www.nationalparkstraveler.com/2016/12/grant-allows-obed-wild-and-scenic-river->

expand-night-sky-programs). Additionally, the park issued a press release to keep the public informed about the grant-funded enhancements to the park's night sky programs and as part of its Dark Sky Initiative (<https://www.nps.gov/obed/learn/news/obed-wsr-uses-astronomy-grant-funds-to-enhance-night-sky-programs.htm>).

VII. Future Plans

The park is planning to host viewing locations for the 2017 Total Solar Eclipse. We are working closely with community organizations such as the Morgan County Tourism Alliance and the Friends of the Oak Ridge National Laboratory to promote this event. While not a night sky program per se, this venue will be an opportunity to continue to promote the park's ongoing astronomy programs and stewardship for our night sky resource as well. The park recently developed a commemorative poster in collaboration with Dr. Tyler Nordgren for the eclipse, and future plans will focus on working with Dr. Nordgren to develop a poster to promote the park's night sky resource. The park will continue efforts to raise the awareness of visitors and the surrounding community regarding the importance of dark skies through a continuation of dark sky interpretation and outreach programs with an emphasis on preserving our dark sky conditions for present and future generations.



VIII. References

- National Park Service Organic Act, 1916
- Wild and Scenic Rivers Act, 1968
- National Park Service Management Policies, 2006
- Obed Wild and Scenic River General Management Plan, 1995
- Obed Wild and Scenic River Long Range Interpretive Plan, 2003
- Obed Wild and Scenic River Foundation Document, 2015

Attachment 1

SOP B-9: Prohibition of Permanently Installed Outdoor Lighting



IN REPLY REFER TO:
A6435

United States Department of the Interior

NATIONAL PARK SERVICE
Obed Wild and Scenic River
P. O. Box 429
Wartburg, Tennessee 37887



Standard Operating Procedure B-9: Prohibition of Permanently Installed Outdoor Lighting

Approved: *Mike Clark*

Effective Date: *May 27 2017*

Sunset Date: This Standard Operating Procedure (SOP) will remain in effect permanently.

Purpose:

To prohibit any permanently installed outdoor lighting in the entire area of the Obed Wild and Scenic River (WSR).

Policy:

To help maintain the dark-sky conditions of the Obed WSR, a prohibition on any permanent outdoor lighting will be implemented. This policy is in accordance with the following National Park Service Management documents listed below. The guidance governing dark sky preservation contained within each document is also noted below. Taken together, the laws, policies, plans, and documents which provide the guiding framework for the Obed WSR make it clear that the protection of the park's dark skies is imperative. The park is committed to preserving its river corridors as a "vestige of primitive America," and this commitment to non-development has the necessary corollaries of avoiding the introduction of artificial light sources into the park area.

1. National Park Service Organic Act - The 1916 NPS Organic Act created the U.S. National Park Service and still serves as the agency's foundation for conservation. Among its purposes is scenic preservation, which includes dark sky resources and the mandate to keep them unimpaired for future generations. "The service thus established shall promote and regulate the use of the Federal areas known as national parks, monuments, and reservations hereinafter specified by such means and measures as conform to the fundamental purpose of the said parks, monuments, and reservations, which purpose is to conserve the scenery and the natural and historic objects and the wildlife therein and to provide for the enjoyment of the same in such manner and by such means as will leave them unimpaired for the enjoyment of future generations."
2. Wild and Scenic Rivers Act - The Obed Wild and Scenic River was established through an October 12, 1976 amendment to the Wild and Scenic Rivers Act of 1968 (Public Laws 90-541 and 94-486). The goal of the Act was to ensure that "certain selected rivers of the Nation which, with their immediate environments, possess outstandingly remarkable scenic, recreational, geologic, fish and wildlife, historic, cultural, or other similar values,

shall be preserved in free-flowing condition, and that they and their immediate environments shall be protected for the benefit and enjoyment of present and future generations.” “Wild rivers” under the act “represent vestiges of primitive America” and the primary emphasis of protection shall be “protecting...aesthetic, scenic, historic, archeologic, and scientific features.”

3. NPS Management Policies 2006 - This volume of NPS Management Policies is the basic Service-wide policy document of the U.S. National Park Service. It is designed to provide NPS management and staff with required and/or recommended actions to help manage parks and programs effectively.
 - a) 4.1.4 Partnerships - “The Service will seek the cooperation of others in minimizing the impacts of influences originating outside parks by controlling noise and artificial lighting...”
 - b) 4.10 Lightscape Management - “The Service will preserve, to the greatest extent possible, the natural lightscape of parks, which are natural resources and values that exist in the absence of human caused light...” “The stars, planets, and earth’s moon that are visible during clear nights influence humans and many other species of animals, such as birds that navigate by the stars or prey animals that reduce their activities during moonlit nights.”
 - c) 9.3.1.4 Amphitheaters - “Artificial lighting must be carefully directed and kept to a minimum, with due regard for natural night sky conditions.”
 - d) 9.3.2.1 Campgrounds - “Lighting will be energy efficient and shielded as much as possible so that visitors have the opportunity to experience the natural darkness and night skies.”
4. Obed Wild and Scenic River General Management Plan - According to the park’s 1995 General Management Plan (GMP), the purpose of the Obed Wild and Scenic River is to “preserve and protect the Obed Wild and Scenic River System and the surrounding area... for the benefit and enjoyment of present and future generations.” The GMP points out that “...development within the boundaries is restricted by the Wild and Scenic Rivers legislation.” The GMP states that the “desired future condition” is one in which the “primitive nature of the river corridor is being protected. Visitors are experiencing a vestige of primitive America—essentially primitive shorelines and unpolluted waters—by floating the river, viewing the river and gorge, hiking on trails, and camping along the river and trails without intrusion by motor vehicles or developments.”
5. Obed Wild and Scenic River Long Range Interpretive Plan - According to the park’s 2003 Long Range Interpretive Plan (LRIP), one of the park’s primary interpretive theme’s is that “[t]he natural mosaic of the Obed is an increasingly rare window into America’s past.” According to the LRIP, the goal of this theme is “to reconnect life and nature by discussing the value of quiet, solitude, and even darkness in the noisy, frenetic, and developed world of the 21st century.”
6. Obed Foundation Document - According to the park’s 2015 Foundation Document, fundamental resources have been identified which warrant primary consideration during planning and management processes because they are essential to maintaining the significance of the park. Included among these fundamental resources is the park’s

connection to a primal landscape, where dark night skies and clean air allow visitors to enjoy wilderness-like encounters with the stars, and experience an array of natural sounds such as the chorus of insects and frogs on a summer night.

Guidelines:

While the policy outlined in this SOP is to prohibit any permanent installation of outdoor lighting in the entire area of the Obed WSR, there may be circumstances where temporary installations of lighting are needed. Examples include commercial filming/photography, weddings, competitive races, construction projects, resource management projects, and emergency operations. In some cases a Special Use Permit may be required (see SOP C-8 Special Use Permits).

In the event of circumstances where temporary installation of lighting are needed outside of emergency operations, the Park will limit the duration, intensity and color of the light to minimize its impacts on the Park's dark sky conditions.