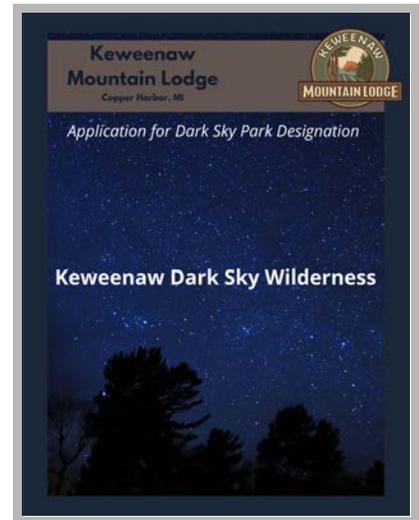


Keweenaw Mountain Lodge Application for Dark Sky Park Designation Version: 3.0 Change Log

Date: December 15, 2021

The following is a summary of the changes that were made between version 2.1 and version 3.0 of this application.



In this version of the application, we addressed the feedback provided by Ashley Wilson on November 8, 2021. We have also provided various updates we felt were important based upon our review since submitting version 2.1. We are grateful for the feedback that Ashley Wilson provided, and John Barentine has provided earlier in the year, as it has been helpful in improving our dark sky activities and our Dark Sky Park application.

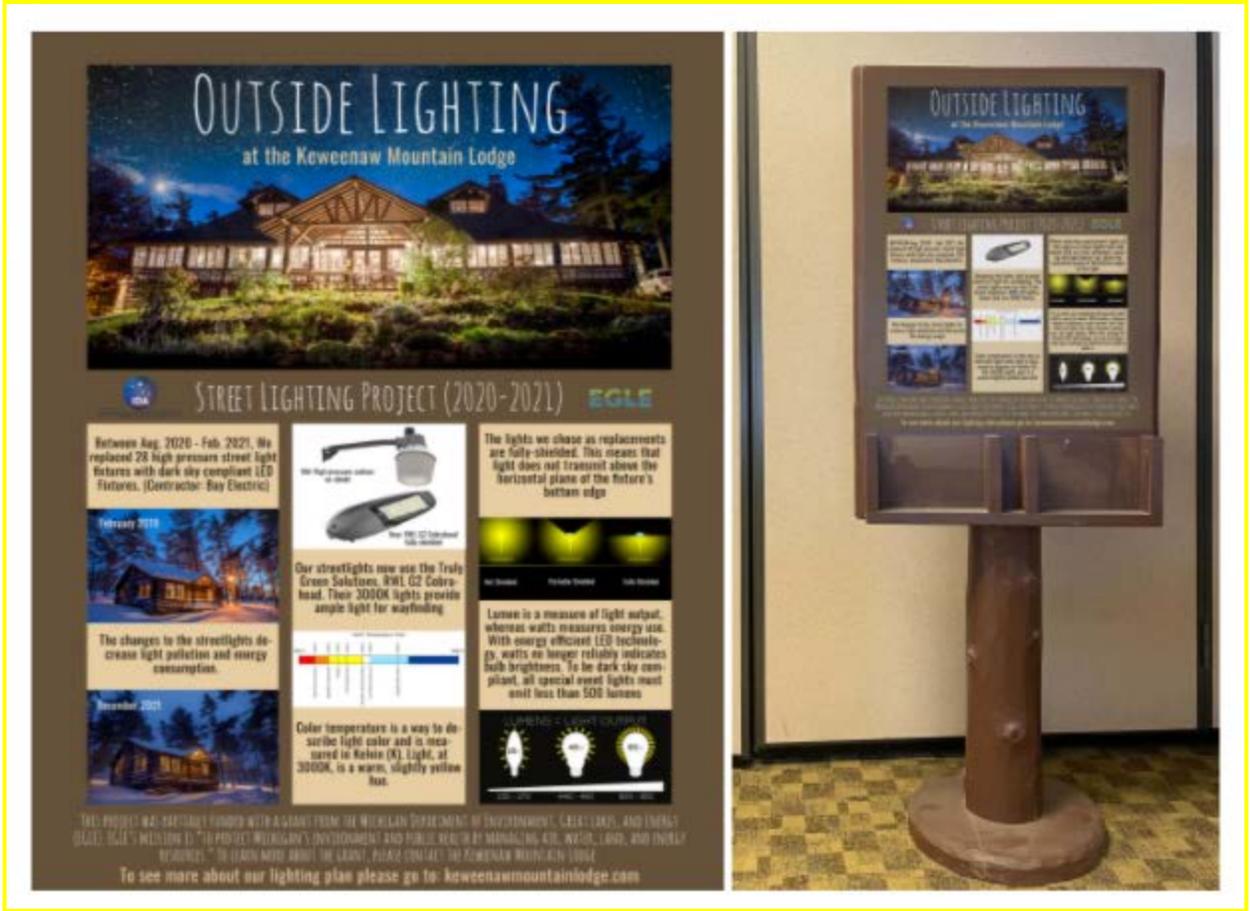
Addressing Ashley Wilson's Feedback

From Wilson:

1. I would like to see more detail in how you are providing public interpretation for your street light project. The webcams and the blog post are a great start, but do guests know to pay attention to the lights while on site? In your materials, can you provide details of the specifications of choosing the best lighting fixture (warm CCT, shielding, targeting, did you include any adaptive controls like dimmers or timers, etc.)? Maybe talk a bit more about the grant you received from the EGLE grant, and if it is possible for others to apply, would you be able to provide some guidance for that resource? Can these materials be presented in an interpretive sign, brochures, etc. for those who are at the facility? The main point is we want a Park's visitors to see and feel dark-sky friendly lighting, so it is just as important that they experience and learn from your fixtures as much as it is to see the night sky.

Response:

We have now designed an infographic sign that can hang at the property and visitors can learn about the street light project we did in 2020-2021 -- as it relates to lighting and energy efficiency. We have provided images of that sign in the application. As well, an image of the sign is provided below.



We have checked with EGLE, Jake Wilkinson, and they are continuing the program. It is a new program, but is similar to the program that we earned.

https://www.michigan.gov/climateandenergy/0,4580,7-364-85453_85455_85516_85523-572262--,00.html

So we are able to provide others information about how we went through the program, and can help them if they decide to apply for the grant. In the infographic sign that we have designed to highlight the Outside Lighting - Street Light Project (2020-2021), we mention that.

We have now mentioned in the application that we can provide more information to interested parties about the EGLE grant program in order to help them with a grant. The following was added:

“As well, we mention in the sign that we are able to provide information about how to work with Michigan’s Department of Environment, Great Lakes, and Energy (EGLE) regarding the current grant program for energy efficiency.”

From Wilson:

2. The Lighting Management Plan is not direct. There should be a document specifically outlining all of your policies related to lighting, and not lumped together in sections. The document should also have the signature of the management agency (or in this case if the Lodge has a board or manager, etc.) and the date the plan was formally approved. Here is an example of a recently approved application that demonstrates what we are looking for: <https://darksky.box.com/s/krxpztqpsyrwe7vmzndr2v42l4feus59> (pp. 24-26)

Response:

We have cleaned up the format of the “Lighting Management Plan and Lighting Inventory” section, to clearly distinguish what the Lighting Management Plan is for the park.

As well, the official signed version of the Lighting Management Plan is included in the Appendix, and can be found on our website.

<https://keweenawmountainlodge.com/about/lighting-management-plan/>

From Wilson:

3. John B neglected to point this out in his previous review, but we also need to see “Policy in park management documents (B, i)”. If you use the link I provided as another example, they had their Board write and sign a resolution supporting the Dark Sky Park (page 16). If you could procure something like this, or show evidence of relevant Lodge documents that demonstrate “Park management documents supporting dark skies and/or the natural nighttime environment as a valued resource,” that would be great.

Response:

We have drafted a corporate resolution supporting the Dark Sky Park. The resolution is included in the application, and can be found on our website so others can find the resolution online. The resolution is signed by John Mueller, currently the sole member of Keweenaw Resort, LLC, which owns the Keweenaw Mountain Lodge. The resolution is officially recorded with the company’s official documents, being a signed corporate resolution by its sole member -- approved and adopted on December 6th, 2021. The corporate resolution can be found in the application just after the nomination letter.

From Wilson:

4. To help clarify your sections, keep the LMP items separate from the inventory. All of your policies should be directly stated before getting into the inventory.

Response:

Changed the section name from “Lightscape Management Plan” to “Lighting Management Plan and Lighting Inventory”, and changed the sub-section name “Lighting Requirements” to “Lighting Management Plan”

Clearly stated the “Lighting Management Plan” sub-section in this section, and included a reference to the signed version of the Lighting Management Plan in the appendix.

From Wilson:

5. Per our Guidelines, Illuminated signs are defined as, “any informational or advertising display that is illuminated by either internal or external means. Descriptive terms are adjusted here accordingly according to the type of illumination.” Therefore, the external sign lights at the Park’s entrance count towards this, and your LMP needs to have language that reflects your active policy on these lights. If these lights are necessary to be kept strictly for wayfinding or identification of concessions in the Park during normal business hours, then state that in the LMP and when the sign will be turned off.

Response:

We have added more information about illuminated signs, and specifically about the entrance sign being used for wayfinding (thus, it is kept on throughout the night, but with two dark sky compliant fixtures).

From Wilson:

6. Note 3 in your inventory (p. 36) states that your entrance sign is not fully dark-sky friendly, which contradicts other language in your application (i.e. stating you could argue being 100% dark-sky friendly and especially in the LMP where you work around not using the sign lighting language). Please update and make sure to reflect this in the true percentage of compliant lighting (p. 32), along with my notes from item #10.

Response:

We had updated the lights on the entrance sign on US Hwy 41 to be dark-sky compliant before we submitted version 2.1. We updated the Inventory Table correctly, but forgot to delete “Note 3”. In this current version, we have deleted “Note 3”.

As a reference, I am including what Note 3 said in version 2.1:

“Note 3: On the entrance sign of the Keweenaw Mountain Lodge (on US Hwy 41), we have two light fixtures that are not fully shielded, and don’t point completely downward. As well, the two light fixtures use halogen light bulbs. We are working to move the location of the lights so they are downward facing, and to replace the lights with fully shielded fixtures, be 3,000K color temperature, and energy efficient (e.g. LED light bulbs).”

This has now been removed in this current version of the application.

The percentage of compliant lighting is up to date accordingly.

From Wilson:

7. If you have holiday lighting, we need to see provisions in your Temporary lighting section that limits when they are visible. The most common example I see is a 60 day period from November 15 - January 15. I also recommend including the following language pertaining to string lighting: “allowable light output will not exceed 70 initial lamp lumens or 125 lumens per linear foot of line or square foot of space.”

Response:

We have added the information you recommended. You can find it in the Temporary Lighting section of our Lighting Management Plan. This is how we worded it:

“Specifically for holiday lighting, the lights will not be in use for more than 60 continuous days (e.g. December 1 to January 31st for Christmas and New Year holiday lighting). When holiday lighting is string lighting, allowable light output will not exceed 70 initial lamp lumens or 125 lumens per linear foot of line or square foot of space.”

From Wilson:

8. If you’re using motion sensors to make fixtures compliant, the LMP needs to clearly state that these fixtures cannot be on longer for 5 minutes at a time.

Response:

We use motion sensors for the outside lights that are on the cabin porches. The cabin porches are covered where there is lighting, and the fixtures stay on for 30 seconds or less. This information has been added to the Lighting Inventory table.

As well, we have updated our Lighting Management Plan to say that any lights that use motion sensors will not stay on longer than 5 minutes.

From Wilson:

9. The text is difficult to read in the inventory. Please increase the font size.

Response:

We have increased the font size from size 8 to size 10 to help with making the inventory table easier to read.

From Wilson:

10. A few things you have listed in the inventory are not compliant:

- a. The angle of the Metal Halide fixtures appear to be cast at an angle, causing upward light radiance. You also do not have CCT accounted for (which should be its own column). Is 20,000lm per fixture really appropriate and needed?
- b. Notes 2 and 5 state that the wall packs are not fully compliant, so don't label it as such in your inventory. This should also say 'no' in the fully shielded? column.
- c. You even state in the notes that the entrance sign is not dark-sky friendly. Update.
- d. I can't see the second road sign fixture. Need a closer, cleaner image to verify.
- e. The cabin porches are just CFL bulbs. You need to document evidence that the structure is completely shielding the light from all angles to prove this. Otherwise, not compliant.
- f. Your solar cabin porche fixtures use 3500K when your LMP restricts all lighting to use 3000K or less. Not compliant.
- g. The fixture at the employee housing looks like a glass container, so no actual shielding is directing the light.
- h. Don't include seasonal or temporary lighting in your inventory.

Response:

We have updated the inventory table as such:

- The notes that referred to Notes 2 and 5 in the previous version have been deleted.
- We updated the table to properly indicate that we have updated the lights for the entrance sign on US Hwy 41 to be dark sky compliant.

- Additional pictures have been provided of the road sign on US Hwy 41 have been provided and hopefully they are clearer. The two road sign fixtures mirror one another.
- The cabin porch lights are LED, not CFL bulbs. We have provided an example picture of one of the cabin porches to show that the porch fully shields these lights (which are on a motion sensor -- staying on less than 5 minutes).
- We have removed all the small solar cabin lights that are above the numbers of each cabin (52 lights). Even though they were fully-shielded and they stayed on for a limited time (2- hours after dusk), they were 3500K. Our light management plan indicates our lights should be 3000K. So we have removed them.
- The fixtures of the employee housing (formerly, the hotel) are not fully-shielded fixtures. However, they are shielded by the porch of the building. Pictures of this have been provided in the application to show this more clearly -- a picture in the day-time and a picture at night (with the lights on).
- We have removed the seasonal and temporary lighting from the inventory table.
- We have added a column for CCT in the inventory table.
- As for the 20,000lm, those fixtures were installed in 2009 for night time skiing / snowboarding -- the snow terrain park. The snow terrain park was only open for two winters under previous ownership (when the Keweenaw County owned the resort). Those two winters were 2009-2010 and 2010-2011. Since new ownership in 2018, we have been investigating opening the snow terrain park again. As part of the investigation, we are testing retrofits that conform to our lighting management plan. The retrofits for these light fixtures are LED bulbs which are 3000K CCT, and 9000 lumens. This has now been elaborated on in the application, per the notes of the lighting inventory table.

From Wilson:

11. Once you have solidified your compliance rate, provide an updated account of when and how you believe you will meet the 90% and 100% compliance rate benchmarks.

Response:

...

From Wilson:

12. Night sky monitoring data: a) Clearly state who is taking annual measurements, b) provide camera settings for your horizon photography, c) state you are using Fahrenheit for temperature readings. For future readings, please note all environmental conditions (i.e. moon position below the horizon, cloud cover (especially after dark adapting first for 1-2 hours), humidity), as that will help explain the anomalies.

Response:

The temperature readings are shown in Fahrenheit. So in the SQM measurement spreadsheet, we have added "(°F)" in the Temp column heading.

In the detailed data table, in the appendix:

- We have added a column in the SQM measurement spreadsheet that indicates the person who took the SQM measurements.
- We had added a "Weather Conditions" column that includes the environmental conditions. For example, "Clear skies, no moon in the sky (2 days before a new moon)". We do not have the humidity levels for the readings. We will work to include the humidity level in future readings.

For future readings, we will add the humidity.

The horizon photos in this version are the same as in the previous versions -- which were taken in April 2021. We are working to take new horizon photos as we don't have the camera settings for the current horizon photos. Once the weather provides us the opportunity to take the horizon photos and log the camera settings, we will update the application accordingly. Until then, the original horizon photos are still included in this version of the application (with no camera settings info).

From Wilson:

13. You are missing a section that provides information for "A description of current and suspected future threats to dark skies over the park." You allude to this with the radiance map on page 23, so please talk about your next steps once you are a certified Park to spread your presence and awareness of the dark-sky movement outside of your boundaries.

Response:

We have added a sub-section, "Potential Threats to the Dark Sky at the top of the Keweenaw" that describes the current and suspected future threats to dark skies over the park.

From Wilson:

14. The outreach section does not provide a strong argument for your long-term commitment to this requirement. See my notes in the corresponding outreach section and suggestions on how to enhance it....

Response:

So to strengthen the supporting documentation for our long-term commitment, we have drafted, and have signed, a corporate resolution stating our current and future commitment to fostering the dark skies. The corporate resolution is now in the document.

From Wilson:

15. If you have any other materials/handouts that you have created, social media posts, etc. about dark skies, that would be an excellent addition to your appendix.

Response:

We have added materials in the appendix that include some more of our materials: fliers, handouts, blog posts, and social media posts.

From Wilson:

16. Minor comment - capitalize all use of National Parks on pg. 19

Response:

We did not see where this would be the case. "National Parks" is capitalized when used with the park name (e.g. Yellowstone National Park), as that would constitute a proper noun. However, when referring to a general group or national parks in general, it isn't capitalized (e.g. "the Lodge is located in between two national parks"). I believe this is the correct punctuation for the usage of "national parks". If this is incorrect, can you point me to a source that indicates that the term "national parks" should always be capitalized? Thanks.

Additional Updates

In addition to the feedback we received from Ashley Wilson, we have made the following updates. We think these updates also help improve our dark sky activities and our Dark Sky Park application.

1. Eagle Harbor Township has written a letter of support for our application -- dated November 15, 2021. That letter, written by Rich Probst, has been included in this version

2. Roger B. Chaffee Planetarium has written a letter of support for our application -- dated November 15, 2021. That letter, written by David L. DeBruyn, has been included in this version

Added the Telescope Lending Program flier / poster. The Telescope Lending Program information can be found on our website:

<https://keweenawmountainlodge.com/activities/stargazing/telescope-lending-program/>

Added the Light Management Workshop flier / poster, as well as other fliers and posters we have developed related to dark sky initiatives at the Keweenaw Mountain Lodge.

Added a paragraph that mentions the news coverage in online and print media which keeps the public informed of stargazing, fostering the dark sky, and our dark sky park application process.

Reordered the support letter by date received / date of each letter.

In this change log, we outline the major changes to the application in this change log. Along with the changes above, there were multiple smaller changes made throughout the document which improved the document but are not captured in the log notes above.