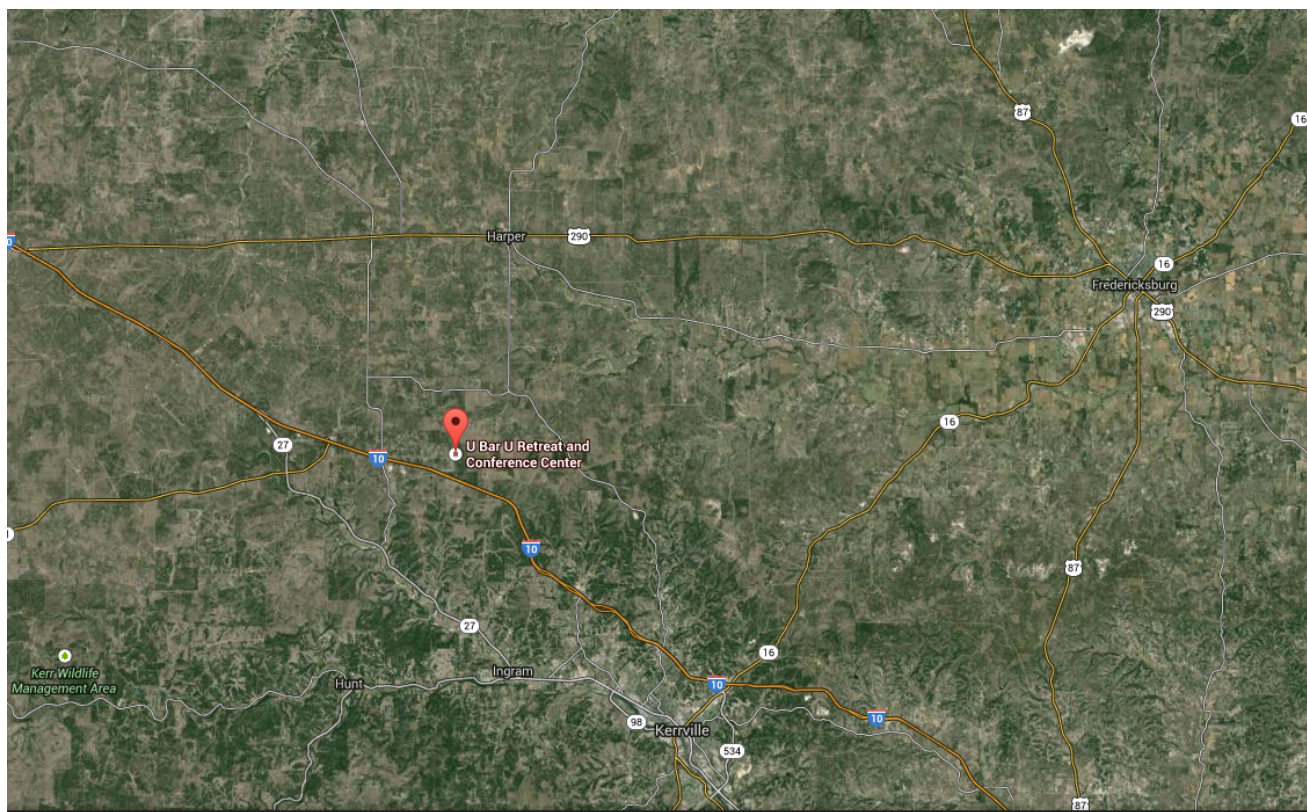


## UBarU Proposal and Light Management Plan (LMP) to the IDA – March 17, 2015

**Introduction** –We, the board of trustees and staff of UBarU, respectively request recognition as a dark-sky park, believing that we have met the IDA guidelines to the best of our ability as shown in this document. UBarU is a 501(c) (3) retreat, conference, and camp center owned and managed by the Unitarian Universalist Friends Retreat Foundation. It is a private facility that is generally open to the public on a fee-by-use basis when not specifically reserved by other groups; however, reserved use is much less than half of the calendar year. It is located in the rural Texas Hill Country approximately 15 miles west of Kerrville, Texas and some 2.4 miles from the intersection of IH-10 and Texas FM 479 at the end of Thrill Hill Road. It has a postal address of Mountain Home, TX which is an unincorporated settlement of population 96 that lies some 4 miles to the southwest of UBarU on the opposite side of IH-10. The following satellite image shows the location of UBarU relative to the small Texas cities of Kerrville and Fredericksburg, and the surrounding Texas Hill Country. The signature feature of Enchanted Rock State Park (which is a recently designated IDA Dark-Sky Park) that lies some 40 miles to the northeast of UBarU can be seen near the top edge of the image above and slightly to the left (i.e., west) of Fredericksburg.

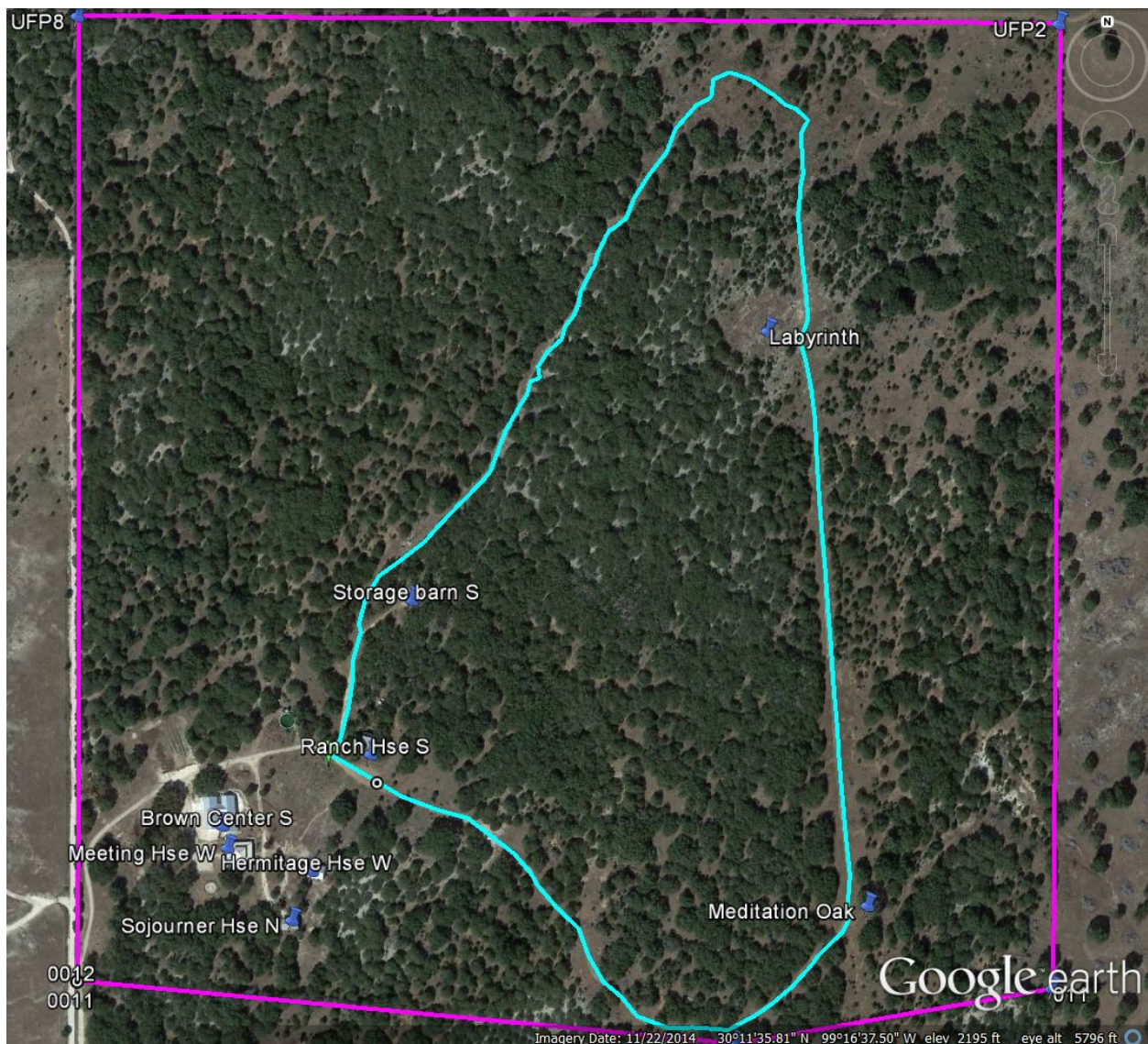


**Satellite Image of Wider Texas Hill Country Area Surrounding UBarU**

UBarU is a nearly-square-shaped, 142-acre facility of which there is a 10-acre campus section located near the southwest corner of the property with lighted buildings, while the other 132 acres are basically left natural with no lighting, and under a wildlife management program with the State of Texas Parks



and Wildlife Department (see the Google Earth satellite image of UBarU below.) The only outside lights within the campus area are all attached to one of five buildings, and there are no plans to install outside lights elsewhere on the property in the near future. Long-range plans do call for additional buildings with outside lighting; however, any new lighting must conform to the new lighting policy which is consistent with IDA and RASC guidelines. The current five buildings with outside lighting are: the Brown Center, the Meeting House, the Ranch House Cottage, the Hermitage Cottage, and the Sojourner Cottage. An inventory of the outside-lighting for each building is listed below following the satellite image, and constitutes the total outside lighting inventory for the facility (there are also two small structures used for storage of maintenance, art, and athletic equipment that have no outside lights.)



**Satellite Image of UBarU Showing Campus & Key Points along Loop Trail (aqua line); the complete UBarU-site boundary is shown by the magenta line**

## UBarU Outside-Lighting Inventory

**Brown Center (BC)** - The BC is the largest and newest building at UBarU with overnight accommodations for up to 60 guests. The building was designed to adhere to dark-sky recommendations such that every outside light is top-shielded (most using IDA recommended fixtures) AND under an eave or covered roof. The building consists of two similar wings each containing two bedroom suites, multiuse bathrooms, and small utility rooms; the wings are separated by a breezeway and connected by a partial roof mid-way between the two wings. The specific lighting is as follows:

1. Inside of the breezeway:
  - A. 8 – LED (40-watt equivalent), 450-lumen, shielded lights bracket the four bedroom suites; all under eaves.
  - B. 2 LED (60-watt equivalent), 800-lumen, shielded lights under connecting roof area near central bathrooms.
  - C. Florescent tube-light in ceiling of central roof section (switched.)
2. Covered Gathering Area (i.e., Patio): 4 – LED (60-watt equivalent), 800-lumen, shielded lights (switched.)
3. Outside Walls of Wings:
  - A. 4 LED or CFL (mix) (60-watt equivalent), 800 or 900-lumen, shielded lights with IDA-approved fixtures, under eaves along the east and west walls.
  - B. 2 LED or CLF (mix) (60-watt equivalent), 800 or 900-lumen, shielded lights with IDA approved fixtures, under eaves at the north end on each wing, and one of these at the south end of the west wing.

**Meeting House (MH)** – The MH is the second-largest and most heavily-used building at UBarU. It contains the site office, meeting and recreational areas, a bunk bedroom, and a full-commercial kitchen that supports dinning for up to 70 people. The building is basically a square structure with a 10-foot wide, covered porch along two of its sides (west and south.) There are two sets of outside lights:

1. 4 – CFL (60-watt equivalent) yellow bug-lights; one above each of the symmetrical doorways in the center of each side of the building (east, west, north and south.) Two of these (west and south) are under the covered porch, while the other two (north and east are under eaves; all four lights also have top-shielded fixtures.
2. 4 – CFL (mostly 65-watt equivalent) flood lights located at the four corners of the building and pointed downward. One of these is under the porch while the other three are under eaves; none have additional shielding.

**Cottages** – There are three cottages that can accommodate 6, 9, or 6 guests respectively. Each has two doorways to the outside with a light immediately above each doorway; these are the only outside lights on the cottages.

1. **Ranch House Cottage (RHC)** – 1 CFL (60-watt equivalent) yellow bug light above the front door that is under the porch and top-shielded. A second similar CFL light is above the back doorway, under the eave and top-shielded.

2. **Hermitage Cottage (HC)** – 1 (60-watt equivalent) yellow bug above front doorway, under porch roof and top-shielded. A second CFL (60-watt equivalent) light is above the doorway to the side deck, under the eave and top-shielded.
3. **Sojourner Cottage (SC)** – 1 CFL (60-watt equivalent) yellow bug light above the front doorway, under the eave with an IDA-approved shielded fixture. A second similar CFL light is above the side doorway, under the eave with the same type of IDA-approved fixture.

All of these lights were within the current guidelines recommended by the IDA, as was verified by an on-site inspection by Dr. John Barentine of the IDA on December 14, 2014. However, the floodlights on two corners of the Meeting House have been replaced with lower-lumen, softer-hue lights. This was done following the recommendations of Dr. Barentine and to be consistent the new Lighting Policy for UBarU, which was developed according to the Guidelines for Outdoor Lighting by the RASC and IDA and approved by the board of trustees at their meeting on January 17, 2015.

All of the windows that open to the outside have coverings (blinds, curtains or shades); however some of these are only minimally adequate in blocking the light that radiates to the outside. These will be upgraded systematically in the future as part of our ongoing LMP.

## **Lighting Policy for UBarU**

The lighting policy for UBarU is based on the IDA/RASC lighting guidelines and is intended to minimize light pollution and preserve the natural beauty of the night skies.

### **Outside Lighting**

1. All outside lighting will be fully shielded such that no light will radiate upwards toward the sky, and horizontal light radiation is to be minimized as much as possible beyond the area needed for illumination. This can be accomplished by using IDA-recommended lighting fixtures as were used for the Brown Center and the Sojourner Cottage. Placing outside lights under eaves or covered porches greatly simplifies the process and should be the first choice for any new lighting whenever practical. However, no new lighting can be installed without a compelling reason to do so, and must be approved by both the Executive Director and the Building Committee of the board of trustees beforehand.
2. The intensity of lighting should not exceed the amount needed to illuminate any particular location for the purpose intended. This means using the lowest lumen-level needed to meet the purpose of the light.
3. Only LED and CFL light bulbs are to be used in all fixtures, with preference to LED bulbs whenever practical and/or affordable.
4. The hue of lighting should be from soft white toward the amber end of the spectrum and away from blue or bright white. More specifically, in order to minimize the emission of harmful blue light, the Correlated Color Temperature (CCT) of lights must not exceed 3200K.
5. Outside lights are to be used only when needed for any particular building. If the building is not in use for guests or an associated activity they are to be turned off except for the minimum needed for safety and/or security.
6. UBarU lies in an unincorporated area of rural Gillespie County, less than two miles from Kerr County. And, since light does not adhere to county boundaries, UBarU will conform to or exceed any lighting regulations enacted by either county now or in the future. However, at this time neither Gillespie nor Kerr counties have any such regulations.

### **Inside Lighting**

1. All windows to the outside for any lighted room must have blinds, curtains or other means of significantly reducing light radiating to the outside.
2. Light that can be seen through window coverings should be no nearer the blue end of the light spectrum than “soft white” light (i.e., have a CCT that does not exceed 3200K.)
3. All inside lighting must be from LED or Fluorescent bulbs; an exception may apply for low-wattage utility lights in ovens, etc.

4. All indoor lights are to be turned off when not needed for their intended function.

**Note:** When replacing light bulbs for either inside or outside fixtures, the replacement bulbs should not exceed the brightness (lumens) or CCT of the previous bulbs without a specific reason, and must conform to the UBarU lighting policy guidelines. The site lighting inventory (which is located in the document repository under “Facilities-Electrical”) may be used in determining the previous lumen level for a particular fixture, if not directly readable on the bulb being replaced.

## Sky Quality Log for UBarU

The following sky-quality log is a list of sky-quality-meter readings taken with a Unihedron Sky Quality Meter (model SQM-L); the numerical measurements given are in mag/arcsec\*\*2. Refer to satellite image on page 2 for an orientation of these locations. Readings for entries 1 -5 & 8 (11 distinct locations) were taken by Roy Ellzey; the set of readings for entry 6 (six locations, 4 new) were taken by Peter Nolan; the set of readings for entry 7 (seven locations, 2 new) were taken by Hilary Hansell & Sheri Phillabaum.

The readings were taken on seven occasions between Nov. 14 and Feb. 21, and represent 17 distinct locations, most of which had repeat readings on different nights. The conditions for each reading or set of readings are given for each date, however one bothersome condition that persisted throughout this entire period was high humidity; which may have caused the SQM readings to be lower than otherwise.

1. Nov. 14, 2014 @ 10:00 – 10:30 CST; conditions were clear after rain with normal outside lights on, except for Brown Center – best reading (obtained twice) near the south end of the athletic field (which is northwest of the Brown Center and immediately across the campus road to the Ranch House) was **21.37**.
2. Dec. 14, 2014 @ 8:15 - 8:45 CST; conditions were clear after two-days of light rain with low fog still in the area and all outside lights off – best reading (obtained three times) in back of and southeast of the Meeting House was **21.86**.
3. Dec. 14, 2014 @ 8:30 – 8:45 CST, a second set of readings was taken with the same conditions as ( 2.) above in back and to the northeast of the Meeting House with a reading (also obtained three times) of **21.55**.
4. Dec. 26, 2014 @ 7:30 – 8:30 CST; conditions were clear and all outside lights turned off, however, there was a waxing crescent moon at 31% full which greatly affected readings; the best reading taken on the Loop Trail just beyond the east end of the parking area in front of the Ranch House was **21.17**.
5. Jan. 16, 2015 @ 9:50 – 10:15 CST; conditions were mostly cloudy with intermittent clearing opportunities and all outside lights off
  1. Location – just west of Sojourner Cottage; best reading was **21.33**.
  2. Location – campus road just in back and north of the Brown Center; best reading was **21.31**.
6. Jan. 20, 2015 @ 8:30 – 9:00 CST; conditions for this set of readings were the same; clear, new-moon phase, and all lights off; humidity-38% and temperature 60 degrees F.
  - 6.1. Location - parking area west of Meeting House – ave. reading 21.25; best – **21.29**.
  - 6.2. Location - just south of Storage Barn – ave. reading - 21.33; best - **21.45**.
  - 6.3. Location – parking area south of Ranch House – ave. reading - 21.26; best – **21.31**.
  - 6.4. Location - Meditation Oak on Loop Trail – ave. reading – 21.27; best – **21.34**.
  - 6.5. Location – Labyrinth on Loop Trail – ave. reading – 21.33; best – **21.45**.
  - 6.6. Location – Top (north most) of Loop Trail – ave. reading – 21.30; best – **21.36**.

7. Feb.19, 2015 @ 8:08 – 9:07 CTS; conditions for this set were the same; mostly clear, sliver crescent moon just set, humidity 74%, temperature 55 degrees F; possibly taken too early in the evening (compare first reading @ 7.1 with 7.8, and 7.4 with 6.2 & 8.3.)
  - 7.1. Location - Fire Pit southwest of Meeting House; best reading was **21.30**.
  - 7.2. Location - Athletic Field north of Brown Center; best reading was **21.20**.
  - 7.3. Location – Front of Ranch House; best reading was **21.27**.
  - 7.4. Location – Barn area; best reading was **21.26**.
  - 7.5. Location – Loop Trail at marker just northwest of Barn; best reading was **21.26**.
  - 7.6. Location – Loop Trail at Meditation Oak; best reading was **21.20**.
  - 7.7. Location - Loop Trail at Labyrinth; best reading was **21.26**.
  - 7.8. Location – last reading @ 9:07 repeated at Fire Pit; best reading was **21.43**.
8. Feb. 21, 2015 @ 9:40 – 10:05 CST; conditions for the set were the same; mostly clear, crescent waxing moon had just set, humidity at 78% and temperature 56 degrees F. Due to an event, the outside lights in the lower campus area were mostly on, thus all the readings were taken along the Loop Trail and barn area in the following order:
  - 8.1 Location – Head of Loop Trail east of Ranch House; best reading was **21.34**.
  - 8.2 Location – mid-way between Ranch House and Barn; best reading was **21.36**.
  - 8.3 Location – in front of Barn; best reading was **21.41**.
  - 8.4 Location – Loop Trail at trail marker just northwest of Barn; best reading was **21.37**.
  - 8.5 Location – Loop Trail mid-way from Ranch House to Meditation Oak; best reading **21.47**.
  - 8.6 Location – Loop trail slightly south of Meditation Oak; best reading was **21.37**.

To ensure that the quality of the skies above UBarU remains at or above the levels measured and logged above, the sky quality will be measured no less than twice per year over a period that spans at least three months. These sky-quality measurements will be taken primarily by members of the Building and Grounds Committee of the board of trustees with the assistance and coordination of the Executive Director of UBarU; the findings will be reported annually as part of the annual report to the IDA. In order to take full advantage of the best nights to take sky-quality measurements, local amateur astronomers in addition to astronomy professors and students from Schreiner University who have been trained in taking measurements, may be used to assist in these measurements under the direction of those with primary responsibility.



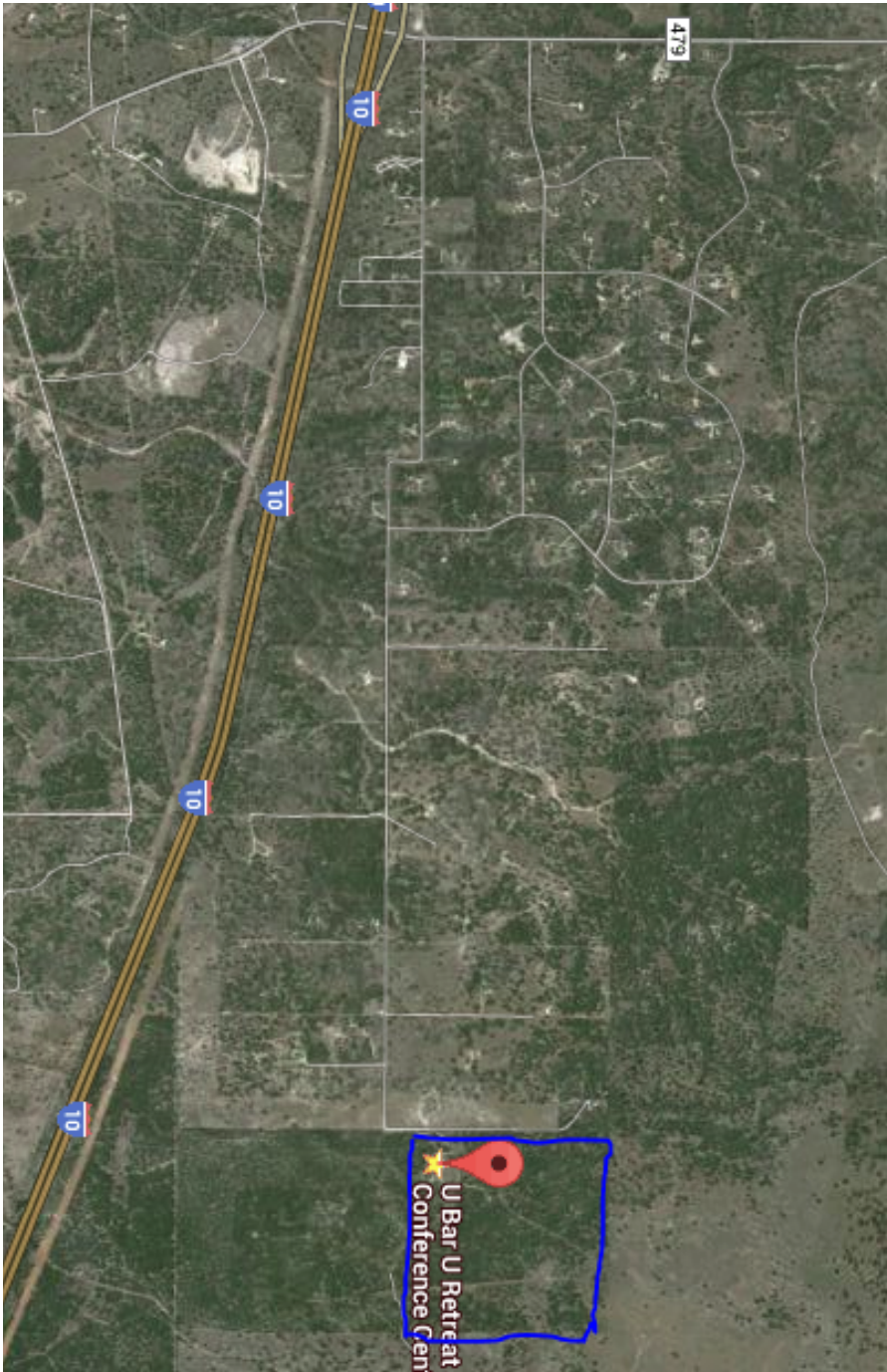
## **Light from Immediate Area Surrounding UBarU**

Given the current lighting used at UBarU and by following the board-approved lighting policy for the facility, it will be a relatively easy and straight-forward matter to keep all lighting used at UBarU within IDA/RASC guidelines into the foreseeable future. It also appears that lighting from the immediately surrounding properties will remain stable and pose no significant problems as well. And given the very limited access to surrounding properties by publicly maintained roadways these properties would not be very attractive to commercial development.

There are three small to medium-sized properties that border UBarU. The Locklear Ranch contains 155 acres and lies mostly south with a small part east of UBarU and contains no lighting. The McDougal Ranch is largest of the bordering properties and borders UBarU to the east and north with a minimally lighted ranch house well to the northeast of the UBarU property line. The third property lies to the west and is approximately 2/3 the size of the Locklear Ranch. This property is divided into two home sites (Meek and Bailey-Villanueva) that each have regularly-occupied, lighted houses. The Meek house is located back and about mid-way up from the west boundary of UBarU, and the Bailey-Villanueva house is near the northwest corner of UBarU, but neither poses any discernible light-pollution problems. All of these owners are long-time owners and/or residents with no plans or interest in selling their property.

The larger immediate area is bounded to the south by IH-10, which is approximately one mile from UBarU at its closest point near the southeast corner, but angles away to the southwest reaching a distance of over two miles at its intersection with Texas FM 479 (a secondary state Farm to Market Road.) There is virtually no development or businesses along either side of IH-10 from its intersection with FM 479 in either direction for ten or more miles.

Texas FM 479 lies slightly more than two miles west of and running north parallel to UBarU. It is in this area lying west of UBarU and between FM 479 that has most of the already sparse population that is within two to three miles from UBarU. Home sites mostly ranging from a few to forty acres are the norm with 15-acre home sites being common. There are three paved county roads that provide access to most of these properties, with scattered, unpaved, private roads needed to reach others. The largest and most prominent of the county roads is Thrill Hill Road which runs from FM 479 mostly east and dead ends at the corner of UBarU Drive and the Locklear Ranch. The next most important county road in this section with home sites closest to UBarU is Deer Run, which is approximately one mile from UBarU at its closest point. Deer Run connects to Thrill Hill Road running north and parallel to UBarU for a short distance before curving to the west to connect with FM 479 over two miles from UBarU. None of the lights from the homes in this section pose any discernible light problems for UBarU, nor is there any enticement for commercial development. For example, a small convenience store located on FM 479 near the intersection of IH-10 closed for lack of business several years ago and never reopened. (See Page 10 below for the satellite map image of the immediate area surrounding UBarU described above.)



UBarU and Immediate Surrounding Area

## **Lighting Beyond Three Miles of UBarU**

The only lighting of any consequence for UBarU that originates from beyond the three-mile immediate area comes from the small city of Kerrville, Texas, which lies approximately 15 miles to the southeast of UBarU. Kerrville has a current population of 23,000 residents which represents a modest growth over the past two decades, and is the population center for Kerr County. It is situated on the Guadalupe River (as are several other smaller towns such as Ingram and Hunt) which runs to the west and south of the city and thus generally away from UBarU. The Guadalupe River is significant as far as light is considered because of two factors. First, population growth for Kerrville and its immediate area tends to be along the river. And second, there are a number of other Hill-Country camp and retreat centers besides UBarU in the area which are mostly on or near the river; all of these are also interested in preserving dark skies as an attraction for their guests and campers.

From UBarU, Kerrville lights currently present no more than a faint glow near the horizon to the southeast. So far this faint glow has caused no significant negative effects on the sky quality above UBarU, or the SQM readings that have been obtained there since some of these have registered into the “gold” range under very favorable local conditions and the rest solidly “silver” under less than optimal conditions. Kerrville city administrators at the Council for Economic Development and the Convention & Visitors Bureau have expressed support for a dark-sky park near the city. Also, in a move to improve sky quality over the city itself, the Kerrville Public Utility Department is replacing all minimally-shielded, incandescent street lights with LED top-shielded lights that are in keeping with IDA recommendations. Thus, it does not appear that any negative effects from light emanating from Kerrville will increase in the foreseeable future.

The next largest population area around a city/town is at Fredericksburg, TX which is some 40 miles to the east-northeast of UBarU. Nothing from this area is visible from UBarU. In fact, this area is only 15 miles (mostly south) from Enchanted Rock State Park which already is an IDA Gold-certified Dark-Sky Park. So Fredericksburg-area lighting clearly has no effect on UBarU.

There is also the small unincorporated town of Harper (population 1,200) that lies some 5-6 miles northeast of UBarU in the same general direction as Fredericksburg that has occasionally caused a faint glow low in the northeastern sky. However, any effects from Harper so far have been very minimal at worst. And, contacts with their chamber of commerce have found willingness on their part to promote good lighting practices to their residents and businesses.

The largest metropolitan area that is closest to UBarU is San Antonio, TX, the closest edge of which lies some 75 miles to the southeast, or about 50 miles to the southeast of Kerrville. But any effects from this area would be merged with Kerrville since they both lie along the same general direction from UBarU, and those have already been determined as minimal. One fact that may dilute any effects from San Antonio is that there are several ridges of high hills that help shield at least the horizontal lights emanating from that region.

## **Educational Programs and Outreach to Promote Dark Skies**

As part of its mission and in keeping with Unitarian Universalist principles, UBarU has historically practiced and promoted care for the environment and being good stewards of the Earth. To this end, environmental education has largely been accomplished by demonstrating that we practice what we preach. These practices have included conservation of water and energy in their use and in our construction, and have extended to good lighting practices as well; for example, all new construction over the past five years that required outside lighting have used top-shielded, IDA-approved lighting fixtures. Besides this, over 90% of the UBarU property is preserved and maintained under a wildlife management program approved and monitored by the Texas Department of Parks and Wildlife. We are in the process of making UBarU a highly sustainable facility through the use of solar power, and rain-water collection for non-potable use in particular. This commitment to caring for the environment has been demonstrated through a number of educational venues which will now include information on the value of dark skies.

Our largest venue to date for education on the environment has been through the summer youth camps that have been offered and well-attended at UBarU since the summer of 2008, and to a lesser degree through annual men's and women's retreats that typically involve environment-friendly projects to enhance the facility. Starting with the upcoming (2015) summer camps, the curriculum for each session will include a segment on dark skies in conjunction with a star party to demonstrate one aspect of what dark skies can provide. The 2014 summer camps served 110 kids in three age-tiered sessions (elementary, middle, and high school) with ages from the third grade through high school seniors; and summer 2015 appears to have an even larger enrollment. These youth come mostly from the largest Texas cities of San Antonio, Austin, Dallas and Houston and will carry what they learn about dark-skies to their respective homes, potentially with positive results.

In related educational outreaches, Astronomy Weekends have been held at UBarU in 2007, 2011, and 2013 primarily as educational events aimed at families and astronomy novices. During these, the benefits of dark skies was demonstrated, but not promoted separately. The Astronomy Weekend which has been scheduled for August 14-16 of this year will address the value of and promote dark-sky practices directly, as will future star parties held at UBarU going forward.

UBarU is in a particularly good position to use star parties as a means to promote and demonstrate the value of dark skies, an approach which is already in place to be used whenever feasible and appropriate. For example, during the weekend of February 18-20 the Regional Conference of LREDA (Liberal Religion Educators' Association) was held at UBarU. This is a national organization that holds a national conference each fall and regional conferences in



February, which in this case served educators of liberal religions from the southwest U.S. A star party was used to take this opportunity to call attention to the value of dark skies as part of the overall mission of being good stewards of the Earth. Thus, the message of the value of dark skies is spread well beyond UBarU.

Another example of this type of outreach was used to educate those who live nearby UBarU through a reception and star party given for the neighbors on March 11<sup>th</sup> of this year. This was the second meeting in which the neighbors were invited to UBarU to learn what a dark-sky park would mean for them, and for us to answer any questions they might have. However, this time we took them to the top of a hill and showed them what maintaining dark skies allowed them to see; they were impressed, and all attending agreed to use proper lighting practices at their own homes. Within the group were six middle-school children who were delighted with the sights and will hopefully share their new knowledge with classmates.

Additional efforts have been made to local amateur astronomers and regional astronomy clubs with good responses. Three of the local astronomers helped with the March 11<sup>th</sup> neighborhood star party, and have volunteered to help with the star parties for the summer camps. Both astronomy clubs in San Antonio have shown interest in using UBarU as a dark-sky site, and the director of the observatory and primary astronomy professor at Schreiner University in Kerrville, Dr. Kim Arvidsson, has asked to use UBarU as a dark-sky site for his students.

Besides incorporating and promoting dark-sky concepts with educational and outreach programs for astronomy, it will be a simple matter to include information on the benefits of dark-skies in other workshops on environmental issues at UBarU. For example, a workshop on climate change sponsored by the regional chapter of the Sierra Club, 350.org, and the Green Team of First UU San Antonio is in the process of being designed and scheduled at UBarU for 2015; including a brief segment on dark-skies and having IDA materials available will be offered as a bonus to this likely receptive group.

In summary, the steps taken by UBarU to educate others in the area and beyond about the value of dark skies and taking steps to preserve them have been: (1) to include program segments on dark skies for events and camps hosted at UBarU whenever appropriate, primarily using star parties; (2) by prominently displaying and making available IDA materials about dark skies to all guests who visit UBarU; (3) by reaching out to neighbors through on-site meetings to explain, discuss and demonstrate the value of dark skies; and (4) to contact key officials with cities, townships, and other retreat/camp facilities in the region to promote dark skies.

## **Log of Measures Taken to Ensure and Promote Dark Skies at UBarU into the Future**

In order to preserve the dark skies above and about UBarU into the future, a number of actions have been taken; these were:

1. A lighting policy was established for UBarU that is consistent with IDA/RASC guidelines, and approved unanimously by the board of trustees on 01/17/2015. The complete policy was included earlier in this LMP document and sets the requirements for current and all future lighting used at the UBarU.
2. Both the president of the board of trustees for UBarU, Jon Durbin, and the Executive Director, Hilary Hansell, have written letters to the IDA expressing their whole-hearted support in creating and maintaining a dark-sky park at UBarU.
3. Any light bulbs or fixtures not meeting the requirements of the lighting policy were replaced or modified to be in compliance. Though not a significant problem, window coverings including blinds, shades and curtains that currently provide only minimal blocking of light will be upgraded to minimize the effects of inside lights over the next two years.
4. Key departments within the Kerrville city government were contacted to see if the city would be supportive of a dark-sky park in the area; and what plans for city lighting could complement the effort to create a dark-sky park at UBarU. It was discovered the city is not only interested in preserving the area night skies, but is in the process of replacing all of their street lights with downward-cone, “moonlight” hue, LED lighting fixtures (which was confirmed by the Engineering Department of the Kerrville Public Utilities Department.) This means that the minimal glow seen in the southeast horizon from UBarU that is caused by lighting from Kerrville will likely be less in the future than it is now. A letter of support for the dark-sky park at UBarU was sent to IDA from the CEO of the Kerrville Convention & Visitors Bureau, Charles McIlvain.
5. Schreiner University, also located in Kerrville, is the largest institution of higher education in the area, and was contacted about their support for a nearby dark-sky park. The university offers astronomy courses and has recently constructed a small observatory on campus to enhance their astronomy program, but lacks a dark-sky site for observing. Thus, the prospect of having a dependable dark-sky park within 20 miles and easy access to the university was received enthusiastically, and a letter of support for the UBarU dark-sky park was sent to the IDA by the professor in charge of the astronomy program and observatory, Dr. Kim Arvidsson.
6. On January 15, 2015 UBarU served as host to the Neighborhood Watch Association that serves most of the immediate neighbors and their property to familiarize members with UBarU, and explain what an IDA dark-sky park is and the benefits it would provide to all

who live or have property nearby. Members were asked for their cooperation in practicing proper lighting, and there was generally good support for the project from the 37 neighbors who attended. One resident, Peter Nolan, who is an amateur astronomer and former president of the Houston Astronomical Society who moved to the area because of the dark skies, has written a letter of support to the IDA.

7. The wider Hill Country area around Kerrville and along the Guadalupe River is home to a number of youth camps and/or retreat centers that share much in common with UBarU. Most if not all of these include the clear, star-filled, Hill Country skies as an enticement for guests and campers. Therefore, a number of these facilities were contacted to tell them about the UBarU application to become a dark-sky park and to ask for their support in the project, and that they make a conscience effort to use good-lighting procedures, if not already doing so. One of the largest, Mo-Ranch, was delighted to hear of the UBarU effort, and is already in the process of improving their own lighting to reduce light pollution. They offered their support for the dark-sky park at UBarU by way of a verbal commitment from the Director of Special Programs, Ken Gould, followed by an e-mail message from him which was forwarded to the IDA.
8. The major newspaper for the area, The Kerrville Times, was contacted about our application to the IDA for the establishment of an IDA-certified, dark-sky park at UBarU. The paper followed up by sending a reporter, Sean Batura, to the site and then ran a featured story of the project and the benefits it would have for the area. The article was widely seen and generated calls from several area amateur astronomers to UBarU offering their support for the park as well their willingness to help as needed.
9. Fredericksburg, TX is the next largest city near UBarU, but has about half the population of and is roughly twice as far from UBarU as Kerrville. There is no perceptible glow at UBarU from Fredericksburg. However, their public utilities department was contacted to see what they are doing to prevent light pollution. According to Bryan Jordin, Director of Development Services, the city council adopted a lighting ordinance which is in place that requires all outside street lights, both public and private, to be top shielded and directed downward to promote dark skies.
10. The town of Ingram, a small suburb (population less than 2,000) of Kerrville, was contacted to see if they are following Kerrville's lead in replacing street lights. However, it was learned that all street lights in that township are privately owned.
11. The Crazy Horse RV Park is located on Thrill Hill Road near FM 479 and about two miles to the west of UBarU. This business recently changed ownership, so the new manager, Ben Pierce, was contacted to inform him of UBarU's application to become a dark-sky park, and the benefits it would provide to the area including the potential for more RVs at his park. He welcomed the news and pledged his intent to help keep the skies dark, stating that the only outside light currently at the park was a single top-shield light

focused downward, and that he would work to see that any future lighting would be consistent with our needs.

12. On Feb. 5, 2015, the Country Clerk's office and the County Judge's office for Gillespie County located in Fredericksburg were contacted to determine if Gillespie County had any regulations pertaining to outside lighting, either public or private; there are none. Likewise, the County Clerk and County Commissioner offices for Kerr County located in Kerrville were contacted for the same reason; and it was confirmed that Kerr County also has no lighting regulations pertaining to either public or private lighting.
13. A star party was given on Feb. 20<sup>th</sup> for the members attending the LREDA Regional Conference being held at UBarU to demonstrate the value of dark skies and how this relates to being good stewards of the Earth.
14. Contact was made with Rob McCorkle of the Texas Parks and Wildlife Department to form a cooperative effort to promote dark skies in the Kerrville area and beyond. He was very supportive of the idea, so we plan to concentrate on regional governing bodies at the city and county level to educate them about the value of dark-skies and to encourage them to develop regulations and/or ordinances to achieve an acceptable level of sky quality.
15. At the request of several neighbors who are supportive of the IDA Dark-Sky Park at UBarU, a reception and star party was scheduled and held on March 11th for the residents who live or have property in the immediate area surrounding UBarU as a follow up to the meeting on January 15th. The purpose of this event was to further explain and demonstrate the positive effects the dark-sky park will have on the neighborhood, and to alleviate any fears that such a park would have a negative impact on the daily lives of those who live there; particularly with respect to a much greater increase in traffic for the area caused by the park. The evening was a significant success and served not only reassure those attending of the benefit the park would have to the neighborhood and surrounding area, but (thanks to reasonably clear skies) also served as an educational outreach as well. We were able to show the neighbors together with six area middle-school children the remarkable things that can be seen with a telescope under truly dark skies.
16. Contacted Kim Behrends of the Harper Chamber of Commerce on Feb. 25th. Harper is an unincorporated town of about 1200 people that lies some 5-6 miles to the northeast of UBarU in the direction of Fredericksburg. In taking SQM readings at UBarU we have sometimes noticed a faint glow low in the sky apparently coming from Harper, and have been told that there are some large warehouses there with fairly bright security lights. Since Harper, like most Hill County Towns and cities, advertises the clear dark skies to attract residents we found that the Chamber is more than willing to cooperate in getting the word out to their residents and businesses to promote voluntary good-lighting

practices to preserve sky quality. We were informed on March 9<sup>th</sup> that the agenda for the next chamber meeting now includes a discussion for maintaining dark-skies in and around Harper, and were asked to supply information on the cost of proper top-shielded light fixtures, which we did.

17. Contacted Danny Batts, Director of Building Services and Chief Building Inspector for the city of Kerrville, on March 9<sup>th</sup> to discuss the possibility of Kerrville adopting a lighting ordinance similar to that of Fredericksburg. After contacting his counterpart in Fredericksburg, he informed us that he has placed consideration for a lighting ordinance as an agenda item for the next Kerrville City Council meeting.

18. On March 17, 2015 the board of trustees for UBarU approved the following resolution:

"Should the board of trustees of the Unitarian Universalist Friends Retreat Foundation ever by choice or necessity decide to transfer ownership of UBarU, a strong, good-faith effort will be made to find an owner who will honor our commitment to respect the land and other environmental initiatives undertaken by us in the spirit of the seventh principle of the UU faith including our commitment to the International Dark-sky Association to maintain the dark-sky park."