

INTERNATIONAL DARK-SKY ASSOCIATION

3223 N First Ave - Tucson Arizona 85719 - 520-293-3198 - www.darksky.org

TO PRESERVE AND PROTECT THE NIGHTTIME ENVIRONMENT AND OUR HERITAGE OF DARK
SKIES THROUGH QUALITY OUTDOOR LIGHTING



DARK SKY RESERVE

www.darksky.org

**International Dark-Sky Association
Dark Sky Reserve Program Criteria**

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DEFINITION OF AN IDA DARK SKY RESERVE

An IDA Dark Sky Reserve (DSR) is a public or private land of substantial size (of 700 km² about 173,000 acres) possessing an exceptional or distinguished quality of starry nights and a nocturnal environment that is specifically protected for its scientific, natural, educational, cultural heritage, and/or public enjoyment.

The IDA DSR consists of a core area meeting the minimum criteria for sky quality and natural darkness, and a peripheral area that supports dark sky values in the core and while receiving similar benefits. The IDA DSR is formed through a partnership of multiple landowners and/or administrators that have recognized the value of the starry night through regulations, formal agreements, and long term planning.

GOALS FOR IDA DARK SKY RESERVE CREATION

- To identify and honor public or private land and their surrounding communities for exceptional commitment to, and success in implementing the ideals of dark sky preservation and/or restoration inside and surrounding the core;
- To promote ecotourism;
- To promote protection of nocturnal habitats, public enjoyment of the night sky and its heritage, and areas ideal for professional and/or amateur astronomy;
- To encourage land administrators, surrounding communities and private interests to identify dark skies as a valuable resource in need of proactive protection;
- To provide international recognition for such sites;
- To encourage other sites to become environmental leaders on dark sky issues by communicating the importance of dark skies and by providing an example of what is possible with proper stewardship.

BENEFITS

Achieving this designation brings recognition of the efforts made by any public and/or private organizations protecting the dark sky of the identified Reserve area. It will encourage, consolidate, and ensure the sustainability of all actions already deployed in the area; moreover, it will enhance awareness of all residents and visitors of environmental stewardship and responsibility.

Designation as an IDA DSR entitles the core and its surrounding communities to display the IDA Dark Sky Reserve logo in official publications and promotions and retain the use of this logo by other groups within the community when identifying the area itself (i.e. an organization/community can say “located in Grand View Dark Sky Reserve”). An IDA DSR may also choose to identify itself through various phrases stating the same effect, i.e. “Located at the Sark Dark Sky Community, a Dark Sky Island.” IDA will maintain a Web page identifying and describing all IDA DSRs available on www.darksky.org.

ELIGIBILITY (ALL MUST BE MET)

- A) The core of the IDA DSR must be a public or a private land protected for scientific, natural, educational, cultural, heritage and/or public enjoyment. AND;
- B) A core area does not have a minimum area requirement but must provide sufficient area to meet the DSR program’s outreach and public access requirements. The core area boundary is not required to be a circle or any specific shape and may follow logical or natural geographic features. If the core includes a publicly protected area, it should strive to encompass the same boundaries. The boundaries may not be arbitrarily drawn to omit areas that would increase the difficulty of achieving DSR approval, but should embrace these areas as an opportunity for improvement. If an irregular shape is chosen it must be explained in the text of the application AND;
- C) The peripheral area should be a minimum of 700 km² (270 mi² or 173,000 acres) around the core (roughly equivalent to a 15 km/9.3 mile radius) OR an area sufficient to mitigate 80% of current and expected future light pollution threats. The actual area of the peripheral, or buffer zone, may be reduced or increased as needed on a case-by-case basis by the Dark Sky Places Committee (DSPC) to ensure future protection of the IDA DSR. AND;
- D) The core of the IDA DSR must provide an opportunity for regular public nighttime access, with or without supervision. A portion of designated land may meet this requirement, or access must be available for a portion of the night. In some cases, such as when working with areas that protect endangered wildlife, this requirement may be adjusted. However regular visitation by the public is essential to meet the goals of the IDSP program. Contact the IDSP program manager for details, AND;
- E) The park must provide an exceptional dark sky resource, relative to the communities and cities that surround it. Core night sky quality must fit in one of the three tier qualifications Gold, Silver, or Bronze. See Sky Quality Tiers Section.
- F) The core and the buffer zone together are referred to as the “Reserve” and “DSR” in this document.

MINIMUM REQUIREMENTS FOR ALL RESERVES

- A) A quality comprehensive Lightscape Management Plan (LMP) should be adopted by the communities to a proportion corresponding with at least 80% of population AND 80% of designated area of protection within the entire IDA DSR (core and periphery). The regulation should address all private and public owners of communities within the area of protection. Some exceptions may apply but are subject to IDA approval. Minimum standards include:
 - i) New, current, and required retrofit lighting must meet the reserve’s LMP (which must meet the “Lightscape Management Plan Guidelines” included in this document). The Guidelines for Outdoor Lighting in RASC/ IDA Dark Sky Places (RASC/IDA-DSP-GOL) should be used while

creating the park's LMP. These guidelines may be found on IDA's website at www.darksky.org/RASCGOL AND;

- ii) Included policy for determining whether an area should or shouldn't be lighted, at what times an area should or shouldn't be lighted, and appropriate illumination levels. (Standards may be more restrictive when close to the core and less restrictive when farther from the core), AND;
 - iii) Fully-shielded fixtures are standard throughout the reserve. An exception to this may be when lighting fixtures contain lamps emitting less than 600 lumens. Any lighting fixtures above 600 lumens are required to use fully shielded fixtures emitting no light at or above the horizontal. When such unshielded fixtures are used, impacts to the lightscape must be minimized with the use of timers and/or curfews, AND; Methods for determining the appropriate type of lamp (color, efficiency, technology) and fixture that should be used for particular tasks and in particular areas with goals to maximize energy efficiency and minimize impact to human vision dark adaptation/recovery time, wildlife, and the nocturnal ecology. It is recommended that only lighting less than 3100K correlated color temperature (CCT) be used, as this will minimize the impact on most wildlife.
 - iv) LMP should conform to or surpass agency or departmental policy on lighting and dark sky protection as well as other applicable guidance and laws (e.g. environmental leadership programs, agency orders, wilderness act, energy management guidelines).
- B) Evidence of land and community commitment to dark skies and lightscape management, as shown by: At least two-thirds (67%) of existing outdoor lighting fixtures within the core conforms to the Lightscape Management Plan (or an alternative fraction approved by the DSPC) AND;
- C) A schedule defining five-year plan when 90% of all outdoor lighting in the core will conform to the reserve's LMP and a written commitment that 100% of the lighting will conform in the future, AND;
- D) A measurement program must be maintained either by the park or by another public or private organization (university, research center, IDA chapter, astronomy club, etc.) to follow the evolution of light pollution in the IDA DSR core and assert that the night sky quality does not degrade. Installation of at least one permanently mounted, approved, night sky brightness monitor (NSBM) and participation in the IDA Global Sky Monitor website is recommended, AND;
- E) Communities must have examples of conforming lighting installations relative to the population they serve, both on roadway AND on different private sites (industries, stores, public services, etc.):
- i) Each participating municipality (excluding businesses, residences, and partners without installed lighting) should have completed at least one highly visible demonstration project with night sky friendly lighting (should include more than 10 lighting fixtures) for each 5000 citizens AND/OR;
 - ii) Approximately 10% of total installed fixtures within the Reserve (outside of the Core) be retrofitted or brought into compliance with the appropriate regulation or guideline. This percentage does not include fixtures that were compliant upon lighting survey, but must show active motivation of the community to make changes through the form of retrofits and/or physical changes to the current fixtures' form.

- F) Participating communities must have a program, either through education, economic incentives, permitting, or regulation, to encourage all new outdoor lighting fixtures to conform to the relevant regulation or guidelines for night sky friendly lighting.
- G) The reserve's commitment to public education.
 - i) The importance of dark skies/natural darkness and the benefits of good lighting should be part of reserve interpretation/outreach programs. If the reserve typically provides interpretive programs, then dark skies must be one of the central themes (dark skies education refers not only to astronomy education but also education about wildlife, efficiency, safety, and human health) communicated through on-site interpretation. If interpretive programs are not typically offered, then publications, flyers, press releases, media, or other outreach are appropriate substitutes, AND
 - ii) Dedicated programming must occur at least four times per year, however, more events are preferable. These events may highlight the dark night sky in any appropriate way (e.g. cultural or historic value, importance to wildlife, astronomical or stargazing events, and a portion of the event must include dark sky awareness or preservation specifically including reference to the IDA and what it means to be an IDA DSR).
- H) Acknowledgement of the protected area, by higher than community level (county/province/etc.), in a perspective that dark skies are an important scientific, natural, cultural, and/or scenic resource value as evidenced by the inclusion in official documents (politics, protocols, management plans, etc.) for long term planning.
- I) Communities within the IDA DSR will receive a certificate verifying the community as a part of the IDA DSR, upon request. Those who wish to erect a sign will have to address a letter to IDA referring them as a part of the IDA DSR and giving specific examples of their engagement (lighting fixture replacement, outreach program, etc.).
- J) Once established, the Reserve must erect and maintain a sign indicating the IDA Dark Sky Reserve designation along a roadway entrance, along a footpath entrance if no roadway exists, or a visitor contact center. Sign must include IDA DSR text and logo. With IDA approval, an alternative wording may be used, such as Dark Sky Wilderness, Night Sky Refuge, or similar. The Reserve may include the awarded tier if desired. Once the sign is erected a picture documenting this sign must be taken and sent to IDA for records along with a description of its location.
- K) Designation is permanent, but is subject to regular review by IDA and possible revocation if minimum requirements are not maintained. More details may be found in the "Reassessment of IDA DSR designation" section.
- L) The reserve will submit an annual report to IDA by October 1st detailing activities and progress towards meeting IDA DSR requirements during the previous twelve months. The Reserve should include dates and brief descriptions of interpretive events, lighting retrofit projects, community outreach, etc. Samples of printed materials and press articles should also be included. The annual report should not require a lot of time to produce, as it should be a compilation of information generated during the year. A form will be provided to aid in the compilation of these details. Electronic submission of these documents is required in MS Word or PDF format. If the annual

report is not sent in a timely fashion, IDA may suspend the IDA DSR's status until the annual reporting requirements have been met.

M) Sky Quality Tiers for Core Determination

- i) The core of the IDA DSR must have identified the sources of light pollution through calculations, maps, photographs or any other proper method AND clearly identify actual and future threats to the sky quality. A plan must be put in place to address these current and future threats.
- ii) Once the minimum requirements have been met, an IDA DSR is designated by IDA at one of three levels or tiers – Gold, Silver, or Bronze indicating the sky quality of the core.
- iii) Gold corresponds to natural, non-polluted or near-natural night skies.
- iv) Silver corresponds to nighttime environments that have minor impacts from light pollution and other artificial light disturbance, yet still display good quality night skies and has exemplary nighttime lightscapes.
- v) Bronze corresponds to areas not meeting the requirements of Silver, yet still offering people, plants and animals a respite from a degraded nocturnal environment.
- vi) The determination of whether the minimum sky quality standard has been met and what tier will be awarded will be decided by IDA based on submitted information.
- vii) For a breakdown of requirements for each tier designation, see the table on the next page:

GOLD, SILVER, AND BRONZE TIER DESIGNATION

Indicator	Gold	Silver	Bronze
Philosophy	Nighttime environments that have negligible to minor impacts from light pollution and other artificial light disturbance, yet still display outstanding quality night skies and have superior nighttime lightscapes.	Nighttime environments that have minor impacts from light pollution and other artificial light disturbance, yet still display good quality night skies and have exemplary nighttime lightscapes.	Areas not meeting the requirements of <i>Silver</i> , yet still offering people, plants and animals a respite from a degraded nocturnal environment and suitable for communicating the issue of light pollution and connecting people with the many aspects of the night sky.
Artificial Light and Skyglow	Typical observer is not distracted by glaring light sources. Light domes are only dim and restricted to sky close to horizon.	Point light sources and glaring lights do not dominate nighttime scene. Light domes present around horizon but do not stretch to zenith.	Areas with greater artificial light and skyglow than <i>Silver</i> , but where aspects of the natural sky are still visible.
Observable Sky Phenomena	The full array of visible sky phenomena can be viewed—e.g. aurora, airglow, Milky Way, zodiacal light, and faint meteors.	Brighter sky phenomena can be regularly viewed, with fainter ones sometimes visible. Milky Way is visible in summer and winter.	Many sky phenomena cannot be seen. Milky Way is seen when pointed out to the average person, as is the Andromeda Galaxy.
Nocturnal Environment	Area is devoid of obvious lights that can cause wildlife disorientation. Artificial light levels are thought to be below the threshold for plant and animal impact. Ecological processes related to nocturnality are unaltered. No lighting atop towers or buildings within park boundary.	Areas that have minor to moderate ground illumination from artificial skyglow. Lights that may cause disorientation to wildlife are distant. Disruption of ecological processes is minor with no impairment to plants or wildlife.	Areas with greater nocturnal impact than <i>Silver</i> , but where ecosystems are still functional.
Visual Limiting Magnitude	Equal or greater than 6.8 under clear skies and good seeing conditions	6.0 to 6.7 under clear skies and good conditions	5.0-5.9 under clear skies and good seeing conditions
Bortle Sky Class	1-3	3-5	5-6
Unihedron Sky Quality Meter	> 21.75	21.74-21.00	20.99-20.00

LIGHTING INVENTORY

- A) When there are numerous outdoor lights it is acceptable to group lights by facility or area. Whether the fixtures are fully-shielded, are special purpose fixtures under 600 lumens, and what the lighting application is should be noted for each fixture or group of fixtures.
- B) Lighting Inventory should also include a plan or stated commitment to bring all outdoor lights into compliance with the Lighting Guidelines.
- C) Daytime photographs or manufacturer diagrams of each fixture type should also accompany the inventory.

A sample table from portion of a Lighting Inventory:

Location	Fixture	Fully-Shielded	Special Purpose <600 lumens	Application	Conformity with LMP
Visitor Center	12 fixtures on 14' pole, 70 W HPS	YES	NO	Parking lot, timer off at 10pm	YES
	2 door lights, 100 W MH	YES	NO	Building egress	YES
	6 bollard (post) lights, 32 W CFL	NO	NO	Walkway	NO – see plan
Historic Cabin	2 carriage style lights at doorways, 40 W incandescent	NO	YES	Historic Preservation, egress	YES
Maintenance Yard	6 wall packs, 250 W MH	NO	NO	Occasional night operations	NO – see plan
	8 Glarebusters, 11 W compact fluorescent	YES	NO	Egress, security	YES

Lamps of 600 lumens output and less include: 40 watt incandescent and less; 35 watt tungsten (quartz) halogen and less; 8 watt fluorescent and less; 11 watt compact fluorescent and less.

LIGHTSCAPE MANAGEMENT PLAN GUIDELINES

The LMP should embody good lighting ethics such as:

- A) Meet or exceed agency or departmental policies regarding outdoor lighting
- B) Only use light when it is needed, where it is needed, and in the appropriate amount.
- C) Outdoor lighting fixtures should be fully-shielded and have appropriate use of timers and motion sensors.

- i) Lighting of less than 600 lumens may be unshielded lights for special purposes, such as historical preservation. The approved special uses should be stated in the LMP. IDA will scrutinize these uses to ensure that reserve lighting is a suitable example of good lighting for the public and protects the nighttime environment to the maximum practical extent. IDA may request additional descriptions, photographs, or drawings of these lights. These lights are not exempt from the lighting guidelines, and must still be designed to minimize impact to the lightscape.
- D) IDA has collaborated with the Royal Astronomical Society of Canada to develop the RASC/IDA Guidelines for Outdoor Lighting (GOL) www.darksky.org/RASCGOL. These guidelines should be adopted as part of the LMP for the reserve. If there are provisions of the GOL that are not appropriate for the reserve, the GOL may be amended or substituted with more suitable guidelines. IDA will review the modifications or substitution and determine on a case-by-case basis if the changes are acceptable for the individual reserve.

PROVISIONAL STATUS

- In some cases, a reserve interested in being designated may lack the resources to do so. If minimum sky quality criteria and appropriate outreach requirements have been met, a reserve may apply for and be granted Provisional status. Provisional status recognizes the park's ongoing work to become an IDA DSR and is intended to be used as a leverage point to enable the necessary lighting upgrades or retrofits and policy changes.
- Provisional status expires after three years. At any time before the end of its provisional status, a reserve may reapply for full status. Material submitted for the removal of provisional status may be an addendum to the initial application as long as the material includes a current assessment of night sky quality, goals, outreach, and programs listed in the original application.
- To be considered for a provisional status, send a nomination package to support the following needed information:
 - Initial sky quality measurements;
 - The minimum quality night sky described under "Eligibility" must be met in order to attain Bronze IDA DSR designation.
 - Documented intent to create and support an IDA DSR;
 - Three partners (municipalities, parks, organizations, etc.) have documented intent to support an IDA DSR;
 - An action plan describing how the aspiring Reserve will meet minimum requirements;

GUIDELINES ON IDA DSR PROCESS

NOMINATION

The nomination may be initiated by an IDA qualified nominator who has personally reviewed a reserve's outdoor lighting and commitment to natural lightscapes, or by a member of the park staff who maintains an IDA membership. To become an IDA qualified nominator you must be an IDA member and be approved by the IDA Dark Sky Places manager. The nomination may be a joint effort between park administration and the qualified nominator. Nominators are encouraged to correspond with IDA staff and the park throughout this process—from first consideration of an IDA DSR through the final submission package.

CORE NOMINATION PROCESS

See "Nomination" for requirements of initial nominator. An official letter must be sent to IDA supporting the nomination from the core administrator. An official letter of support from the communities/county/province or other form of juristic state division that confirms their long-term engagement and commitment towards the creation of the IDA DSR must also be sent to IDA.

IDA DSR APPLICATION PROCESS

STEPS FOR APPLICANT

- A) Initial contact with IDA by phone or email to discuss the process and make recommendations followed by regular contact to consult with IDA staff and to review progress;
- B) A formal point of contact (POC) person is designated and their phone, address, and email information is forwarded to IDA staff. Before and after designation, any changes to this POC, or their information, must be communicated to IDA in order to ensure accurate communication at all times;
- C) Upon completion, the Reserve sends the application to IDA staff for review of the document. IDA staff confirms that the application is complete and ready for submission;
- D) Completed application packet in .pdf and/or MS Word .doc format sent electronically to DSPPC by IDA staff for review.
- E) Submit in plenty of time for IDA staff to review and prepare your application to make the bi-monthly deadline that you prefer, as found on www.darksky.org/idsp Requests to rush applications will NOT be accepted; meaning that planning ahead is essential if the park is planning to meet a deadline.

TO BE INCLUDED IN AN IDA DSR SUBMISSION

- A) Map(s) of the area to be designated clearly indicating the Reserve, the Core, and the communities within the borders.
- B) Letter of nomination support from the core administrator.
- C) Any management documents supporting dark skies and/or natural lightscapes as a valued resource.
- D) Documentation of sky quality, light pollution measures, satellite pictures, maps, photographs, or other evidence that demonstrates the noteworthiness of the resource. Measurements of night sky brightness using an approved night sky brightness meter (NSBM), such as the Unihedron Sky Quality Meter, showing at least 12 locations within the reserve. Measurements should document the approximate darkest and brightest areas of the reserve. Data included in the application must contain an updated survey of the reserve completed no more than two years before the application's submission along with any other relevant surveys. Learn more about creating a night sky quality survey on IDA's website www.darksky.org/nightsurvey
- E) Lightscape Management Plan
- F) Documentation signed by core administrator showing a Lighting Inventory of the core and a plan to bring 90% of outdoor lighting into compliance with the reserve's LMP within five years; as well as a signed commitment to bring the reserve into 100% compliance in the future.
- G) Municipality, community, and core agency or departmental policy on outdoor lighting and dark sky protection as well as the core's LMP.
- H) Any documentation of the importance of the core. (e.g. site historical research conducted there, importance to indigenous nocturnal wildlife, cultural significance, etc.)
- I) Documentation or description of the preservation or restoration project (e.g. community outreach, lighting retrofits, etc.) currently in action.
- J) Description of interpretive program or interpretive products related to dark skies/natural darkness. Any related examples of successful education (photos, documentation of student projects, etc...)
- K) Future Plans
- L) Proposed alternative wording for IDA DSP (e.g. Dark Sky Wilderness, Dark Sky Refuge, etc.), if desired.
- M) An outline of an application is available and may be used upon request.

IDA REVIEW PROCESS

- A) Applications are sent to the committee on a bi-monthly basis.
- B) Before the reserve's final application is submitted it is highly recommended that the reserve be in regular conversation with IDA staff to perfect the application before the deadline. Applications not ready for submission by the current deadline for committee consideration will be considered at the

next committee meeting.

- C) IDA staff forwards application to Dark Sky Places committee (DSPC) for review at the deadline.
- D) Approval of application by DSPC is by a 2/3-majority vote, or denial with reasons and recommendations. The DSPC committee may consider applications for up to two months before releasing a decision.
- E) Determination of sky quality tier - Gold, Silver, or Bronze.
- F) If approved the location will be notified and the program manager will organize a press release with the location during a 10-day waiting period during which the Board of Directors will have the formal right to veto should they perceive a problem with the application. The reserve has the right to choose when the decision is made public but must organize a release date with IDA unless otherwise discussed and agreed upon by both parties.
- G) If approved, the reserve is awarded the IDA DSR designation and listed along with their application on the IDA website. By submitting the application the DSR agrees to have their application posted to the website unless otherwise stated.
- H) If denied, a letter is sent to the applicant outlining elements of the application that need improvement and specific recommendations for ways to remedy them. Applications can be resubmitted, after a minimum of three bi-monthly periods have passed, for future consideration after remediation is complete.
- I) Periodic checks, through the submission of the annual report, will be preformed to ensure that minimum standards and objectives of the program are being upheld and adequate progress is being made.

REASSESSMENT OF IDA DSR DESIGNATIONS

To ensure that IDA DSRs continue to be exemplary in their protection and restoration of natural lightscapes, IDA will periodically reevaluate the DSR. This is done to confirm that the Reserve continues to meet the minimum requirements, is sustaining partnership and interpretation efforts, and is making adequate progress toward 90% compliance with the LMP. Yearly assessments will be due October 1st from the DSR providing details about these topics. If the annual report is not sent in a timely fashion or questions or concerns cannot be resolved after the review, it may be necessary for IDA to suspend/revoke the IDA DSR's status until resolution can be achieved. A form for the annual report may be found on IDA's website at www.darksky.org/reserves