

A Bill for an Act Relating to Starlight Reserve.

Be It Enacted by the Legislature of the State of Hawaii:

PART I

SECTION 1. (a) The legislature finds that the Declaration in Defense of the Night Sky and the Right to Starlight was approved at the starlight conference, held on the island of La Palma in April 2007. The declaration constituted the general and conceptual framework of the starlight initiative. The proposal to develop a starlight reserve concept was one of the additional recommendations to the starlight declaration to be carried out in cooperation with the World Heritage Center. Subsequently, an action plan was developed based on the principles of:

- (1) Recognizing the importance of promoting the Declaration in Defense of the Night Sky and the Right to Starlight through the different United Nations Educational, Scientific and Cultural Organization (UNESCO) programs and initiatives within the framework of the UNESCO conventions;
- (2) Recognizing that light pollution must be considered as an imminent threat to the environment, as well as that climate change poses a threat to the outstanding universal values of world heritage sites;
- (3) Recognizing that the preservation of dark skies is an important and necessary part in the process of the protection and safeguarding of natural and cultural properties worldwide; and
- (4) Following the call of the UNESCO Director-General for an integrated approach to issues of environmental preservation and sustainable development.
 - (b) Specifically, the action plan proposed to:
 - (1) Elaborate the concept of starlight reserve;
 - (2) Identify the different categories of areas, reserves, and properties accordingly to this concept;
 - (3) Establish general technical recommendations for starlight protection related to the safeguarding of natural and cultural properties, light pollution, and intelligent lighting;
 - (4) Integrate these recommendations into the different world heritage programs and initiatives; and
 - (5) Evaluate the possibility of nominating the starlight reserve onto the world heritage list, the biosphere reserve, or both.

A starlight reserve is a site where a commitment to defend the quality of the night sky and access to starlight has been established. Its main function is to preserve the quality of the night sky and its associated cultural, scientific, astronomical, natural, and landscape-related values. A starlight reserve is to have a core or dark zone, which is an unpolluted area where natural night sky light conditions are kept intact. This core zone is to be protected by a buffer or protection zone to avoid the adverse effects of air and light pollution reaching the core zone. Finally, there is to be an external zone where intelligent and responsible lighting criteria are to be enforced, protecting night sky quality from harmful factors such as air pollution.

(c) The requirements for each starlight reserve are to be specific to the characteristics, singularities, and functions of each site and that are targeted to preserve the quality of astronomical observations and wildlife conservation, while maintaining the integrity of nighttime landscapes and cultural heritage scenarios. The declaration of a starlight reserve is to be accompanied by a participative action plan and an ensemble of recommendations aimed at preserving

and recovering night sky quality up to feasible limits and that also preserve related cultural, educational, scientific, and environmental benefits.

(d) The legislature also finds that light pollution has become a world-wide problem and is gradually diminishing the human capacity to observe the stars. The International Commission on Illumination defines light pollution as the sum of all adverse effects of artificial light in as much as they have an impact on the environment, including the direct impact of outdoor lighting and the brightening of the night sky that results from the reflection of radiation, also known as glare or sky glow. Avoidable light pollution refers to light flow emitted at night by artificial light sources that are inappropriate in intensity, direction, or spectral range and that are unnecessary to carry out their intended function or when artificial lighting is used in particular sites, such as observatories, natural areas, or sensitive landscapes. Irresponsible lighting includes over-illumination, which makes an excessive and unnecessary use of artificial light, as well as poorly designed luminaires that cause glare or sky glow. (A luminaire is an apparatus that controls the distribution of light given by a lamp that includes all the components necessary for fixing and protecting the lamp and for connecting it to a power supply, colloquially known as a lighting fitting or fixture.)

The legislature further finds that light pollution causes the greatest amount of harm to the quality of the night sky even though viable solutions are available to reduce light pollution. The purpose of this Act is to reduce the amount of light pollution so that the quality of the night sky is preserved in the State.

PART II

SECTION 2. Statewide starlight reserve strategy; advisory working committee; duty. (a) The department of business, economic development, and tourism shall develop a statewide starlight reserve strategy. The department of business, economic development, and tourism shall be assisted by a temporary advisory committee, to be placed within the department for administrative purposes. The members of the temporary advisory committee shall consist of:

- (1) The director of the department of business, economic development, and tourism or the director's designee;
- (2) The comptroller or the comptroller's designee;
- (3) The director of the institute for astronomy of the University of Hawaii or the director's designee;
- (4) The director of health or the director's designee;
- (5) The director of transportation or the director's designee;
- (6) The chairperson of the board of land and natural resources or the chairperson's designee;
- (7) The offices of the mayors of the counties of Kauai, Maui, Hawaii, and the city and county of Honolulu or the mayors' designees;
- (8) The chairperson of the office of Hawaiian affairs or the chairperson's designee;
- (9) A member of the Hawaiian Astronomical Society, selected by its board of directors; and
- (10) A lighting engineer selected by the director of the department of business, economic development, and tourism.

(b) The director of business, economic development, and tourism shall designate the chairperson of the advisory committee. The advisory committee shall convene its initial meeting no later than July 30, 2009.

(c) It shall be the duty of the department of business, economic development, and tourism, assisted by the advisory committee, to develop a statewide

starlight reserve strategy to preserve the quality of the night sky and its associated cultural, scientific, astronomical, natural, and landscape-related values. The department shall develop necessary proposed legislation to implement the statewide starlight reserve strategy, including a light pollution law to eliminate irresponsible lighting, such as illumination that makes excessive or unnecessary use of artificial light and poorly designed luminaires that cause glare or sky glow.

SECTION 3. Statewide starlight reserve strategy; principles and functions; components. (a) The statewide starlight reserve strategy shall be based on the following principles expressing the functions of the starlight reserve concept:

- (1) To value, protect, and promote the tangible and intangible worldwide cultural heritages associated with the night sky;
- (2) To defend the quality of the night sky for astronomical observation, including establishing measures and regulations to prevent its deterioration through light and atmospheric pollution;
- (3) To establish new bases, especially in natural areas, to safeguard the equilibrium of the biosphere and to protect the earth's biological diversity whose nocturnal and diurnal habitats are threatened by light and atmospheric pollution; and
- (4) To preserve and recover the quality of nocturnal starlit landscapes that has traditionally been perceived by people as an integral part of their natural and cultural heritage.

(b) The statewide starlight reserve strategy shall have the following components:

- (1) An intelligent lighting system that includes:
 - (A) Reduction and prevention of light pollution created by:
 - (i) The unnecessary use at night of artificial light sources that are inappropriate in intensity, direction, or spectral range; and
 - (ii) The use of artificial lighting in certain areas such as observatories, natural areas, or sensitive landscapes;
 - (B) Reduction and prevention of glare or sky glow caused by over-illumination and poorly designed luminaires; and
 - (C) Minimizing the use of artificial lighting only for essential purposes and thereby also conserving energy;
- (2) A tourism component that preserves the quality of the night sky through the use of innovative promotional and educational ecotourism products related to astronomical observation, natural nightscapes, and associated native Hawaiian cultural values and heritage;
- (3) An educational component to educate both Hawaii residents and visitors to the State about the importance of preserving the night sky; and
- (4) A statewide monitoring component to measure and monitor the quality of the night sky.

SECTION 4. Starlight reserve areas; categories. The statewide starlight reserve strategy shall consider the inclusion of the following categories of starlight reserve areas:

- (1) Starlight heritage site: archaeological and cultural sites or monuments created as an expression of humanity's relationship with the firmament, which reflect the development of astronomy and its manifestation in the arts and traditions, and that may include:
 - (A) Monuments or groups of buildings related to astronomy;

- (B) Relevant sites and manifestations of cultural heritage related to sky observation, including archaeoastronomical sites;
 - (C) Areas where expressions of tangible and intangible cultural heritage associated with astronomy and starlight, including music, traditions, legends, folk tales, and folklore, still survive; and
 - (D) World heritage properties and biosphere reserves;
- (2) Starlight astronomy site: exceptional observation sites for optical, infrared, and radio astronomy, including potential future sites, and that may include:
- (A) Relevant astronomical observatories and their environment;
 - (B) Potential areas for advanced astronomical observation, recognized by the International Astronomical Union and the international scientific community; and
 - (C) Exceptional astronomical observation sites whose characteristics render them especially suited for the development of educational and scientific activities or for the promotion and spread of astronomy;
- (3) Starlight natural site: natural areas where the integrity of the natural conditions, including the quality of the natural night sky, is preserved, and that may include:
- (A) Habitats of particular relevance that host nocturnal wildlife species particularly sensitive to the loss of night sky quality or vulnerable to the effects of light pollution;
 - (B) Terrestrial and marine areas used as corridors and resting sites by migratory wildlife species whose habits and displacement are harmed by glare or loss of natural night light;
 - (C) Protected natural areas with a special relevance for the development of night-time environment research and management and the study of the natural patterns of light and dark;
 - (D) World heritage properties, biosphere reserves, Ramsar Convention wetland sites, and marine or terrestrial protected areas of international importance; and
 - (E) All protected nature areas in general, since all species and ecosystems depend on natural cycles of day and night;
- (4) Starlight landscape: places where aesthetic and cultural manifestations of the night sky can be observed, and that may include:
- (A) Areas where the starry sky, as well as exceptional manifestations of light-related phenomena, can be observed;
 - (B) Expressions of nature and geological monuments that create night landscapes of acknowledged value;
 - (C) Cultural landscapes or expressions of natural and artificial works of nature and where the astronomical dimension prevails; and
 - (D) Natural heritage properties and biosphere reserves;
- (5) Starlight oasis-human habitat: populated areas free from negative effects that impede star viewing and decrease night sky quality and that may include:
- (A) Rural areas of outstanding singularity where the starry sky view is part of their recognized identity;

- (B) Small villages that maintain the night sky reasonably free from atmospheric and light pollution; and
 - (C) Tourist destinations that consider the night sky an important resource and that offer activities based on or related to astronomy and the enjoyment of the night sky; and
- (6) Mixed starlight site: sites that combine two or more categories under paragraphs (1) through (5).

SECTION 5. Statewide lighting law; considerations; lighting in zones.

The department of business, economic development, and tourism, with the assistance of the advisory group, shall develop necessary proposed legislation to implement a statewide intelligent lighting and light pollution law taking into consideration the following:

- (1) Develop rules regulating the requirements of outdoor lighting to guarantee the protection of night sky quality;
- (2) Incorporate measures to conserve energy and promote responsible outdoor night lighting;
- (3) Develop standards for intelligent lighting design in architecture, urban planning, engineering, and infrastructure development;
- (4) Strengthen statewide commitment to preserving the night sky by adopting intelligent lighting in the public sector;
- (5) Promote labeling to recognize intelligent lighting fixtures and products;
- (6) Develop alliances with both public and private entities primarily responsible for outdoor night lighting;
- (7) Develop measures to avoid obtrusive light and improve the quality of life of local populations; and
- (8) Educate local residents about existing solutions, as well as the environmental, personal, and energy-saving benefits that intelligent night-sky lighting entails.

SECTION 6. Report; advisory committee terminated. (a) The department of business, economic development, and tourism shall submit a final report to the legislature no later than twenty days prior to the convening of the regular session of 2010. The report shall include findings, recommendations, and necessary proposed legislation to implement this part.

(b) The advisory committee created in this part shall be terminated on June 30, 2011.

PART III

SECTION 7. This Act shall take effect upon its approval.

(Approved June 29, 2009.)