
A BILL FOR AN ACT

RELATING TO STARLIGHT RESERVE.

BE IT ENACTED BY THE LEGISLATURE OF THE STATE OF HAWAII:

1 **PART I**

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

12 (1) Recognizing the importance of promoting the
13 Declaration in Defense of the Night Sky and the Right
14 to Starlight through the different United Nations
15 Educational, Scientific and Cultural Organization
16 (UNESCO) programs and initiatives within the framework
17 of the UNESCO conventions;



- 1 (2) Recognizing that light pollution must be considered as
2 an imminent threat to the environment, as well as that
3 climate change poses a threat to the outstanding
4 universal values of world heritage sites;
- 5 (3) Recognizing that the preservation of dark skies is an
6 important and necessary part in the process of the
7 protection and safeguarding of natural and cultural
8 properties worldwide; and
- 9 (4) Following the call of the UNESCO Director-General for
10 an integrated approach to issues of environmental
11 preservation and sustainable development.
- 12 (b) Specifically, the action plan proposed to:
- 13 (1) Elaborate the concept of starlight reserve;
- 14 (2) Identify the different categories of areas, reserves,
15 and properties accordingly to this concept;
- 16 (3) Establish general technical recommendations for
17 starlight protection related to the safeguarding of
18 natural and cultural properties, light pollution, and
19 intelligent lighting;
- 20 (4) Integrate these recommendations into the different
21 world heritage programs and initiatives; and



1 (5) Evaluate the possibility of nominating the starlight
2 reserve onto the world heritage list, the biosphere
3 reserve, or both.

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

17 (c) The requirements for each starlight reserve are to be
18 specific to the characteristics, singularities, and functions of
19 each site and that are targeted to preserve the quality of
20 astronomical observations and wildlife conservation, while
21 maintaining the integrity of nighttime landscapes and cultural
22 heritage scenarios. The declaration of a starlight reserve is



1 to be accompanied by a participative action plan and an ensemble
2 of recommendations aimed at preserving and recovering night sky
3 quality up to feasible limits and that also preserve related
4 cultural, educational, scientific, and environmental benefits.

5 (d) The legislature also finds that light pollution has
6 become a worldwide problem and is gradually diminishing the
7 human capacity to observe the stars. The International
8 Commission on Illumination defines light pollution as the sum of
9 all adverse effects of artificial light in as much as they have
10 an impact on the environment, including the direct impact of
11 outdoor lighting and the brightening of the night sky that
12 results from the reflection of radiation, also known as glare or
13 sky glow. Avoidable light pollution refers to light flow
14 emitted at night by artificial light sources that are
15 inappropriate in intensity, direction, or spectral range and
16 that are unnecessary to carry out their intended function or
17 when artificial lighting is used in particular sites, such as
18 observatories, natural areas, or sensitive landscapes.
19 Irresponsible lighting includes over-illumination, which makes an
20 excessive and unnecessary use of artificial light, as well as
21 poorly designed luminaires that cause glare or sky glow. (A
22 luminaire is an apparatus that controls the distribution of



1 light given by a lamp that includes all the components necessary
2 for fixing and protecting the lamp and for connecting it to a
3 power supply, colloquially known as a lighting fitting or
4 fixture.)

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

11 **PART II**

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

- 20 (1) The director of the department of business, economic
21 development, and tourism or the director's designee;
22 (2) The comptroller or the comptroller's designee;



- 1 (3) The director of the institute for astronomy of the
2 University of Hawaii or the director's designee;
- 3 (4) The director of health or the director's designee;
- 4 (5) The director of transportation or the director's
5 designee;
- 6 (6) The chairperson of the board of land and natural
7 resources or the chairperson's designee;
- 8 (7) The offices of the mayors of the counties of Kauai,
9 Maui, Hawaii, and the city and county of Honolulu or
10 the mayors' designees;
- 11 (8) The chairperson of the office of Hawaiian affairs or
12 the chairperson's designee;
- 13 (9) A member of the Hawaiian Astronomical Society,
14 selected by its board of directors; and
- 15 (10) A lighting engineer selected by the director of the
16 department of business, economic development, and
17 tourism.
- 18 (b) The director of business, economic development, and
19 tourism shall designate the chairperson of the advisory
20 committee. The advisory committee shall convene its initial
21 meeting no later than July 30, 2009.



1 (c) It shall be the duty of the department of business,
2 economic development, and tourism, assisted by the advisory
3 committee, to develop a statewide starlight reserve strategy to
4 preserve the quality of the night sky and its associated
5 cultural, scientific, astronomical, natural, and landscape-
6 related values. The department shall develop necessary proposed
7 legislation to implement the statewide starlight reserve
8 strategy, including a light pollution law to eliminate
9 irresponsible lighting, such as illumination that makes
10 excessive or unnecessary use of artificial light and poorly
11 designed luminaires that cause glare or sky glow.

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

- 17 (1) To value, protect, and promote the tangible and
18 intangible worldwide cultural heritages associated
19 with the night sky;
- 20 (2) To defend the quality of the night sky for
21 astronomical observation, including establishing



1 measures and regulations to prevent its deterioration
2 through light and atmospheric pollution;

3 (3) To establish new bases, especially in natural areas,
4 to safeguard the equilibrium of the biosphere and to
5 protect the earth's biological diversity whose
6 nocturnal and diurnal habitats are threatened by light
7 and atmospheric pollution; and

8 (4) To preserve and recover the quality of nocturnal
9 starlit landscapes that has traditionally been
10 perceived by people as an integral part of their
11 natural and cultural heritage.

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

14 (1) An intelligent lighting system that includes:

15 (A) Reduction and prevention of light pollution
16 created by:

17 (i) The unnecessary use at night of artificial
18 light sources that are inappropriate in
19 intensity, direction, or spectral range; and

20 (ii) The use of artificial lighting in certain
21 areas such as observatories, natural areas,
22 or sensitive landscapes;



1 (B) Reduction and prevention of glare or sky glow
2 caused by over-illumination and poorly designed
3 luminaires; and

4 (C) Minimizing the use of artificial lighting only
5 for essential purposes and thereby also
6 conserving energy;

7 (2) A tourism component that preserves the quality of the
8 night sky through the use of innovative promotional
9 and educational ecotourism products related to
10 astronomical observation, natural nightscapes, and
11 associated native Hawaiian cultural values and
12 heritage;

13 (3) An educational component to educate both Hawaii
14 residents and visitors to the State about the
15 importance of preserving the night sky; and

16 (4) A statewide monitoring component to measure and
17 monitor the quality of the night sky.

18 SECTION 4. **Starlight reserve areas; categories.** The
19 statewide starlight reserve strategy shall consider the
20 inclusion of the following categories of starlight reserve
21 areas:



- 1 (1) Starlight heritage site: archaeological and cultural
2 sites or monuments created as an expression of
3 humanity's relationship with the firmament, which
4 reflect the development of astronomy and its
5 manifestation in the arts and traditions, and that may
6 include:
- 7 (A) Monuments or groups of buildings related to
8 astronomy;
- 9 (B) Relevant sites and manifestations of cultural
10 heritage related to sky observation, including
11 archaeoastronomical sites;
- 12 (C) Areas where expressions of tangible and
13 intangible cultural heritage associated with
14 astronomy and starlight, including music,
15 traditions, legends, folk tales, and folklore,
16 still survive; and
- 17 (D) World heritage properties and biosphere reserves;
- 18 (2) Starlight astronomy site: exceptional observation
19 sites for optical, infrared, and radio astronomy,
20 including potential future sites, and that may
21 include:



- 1 (A) Relevant astronomical observatories and their
2 environment;
- 3 (B) Potential areas for advanced astronomical
4 observation, recognized by the International
5 Astronomical Union and the international
6 scientific community; and
- 7 (C) Exceptional astronomical observation sites whose
8 characteristics render them especially suited for
9 the development of educational and scientific
10 activities or for the promotion and spread of
11 astronomy;
- 12 (3) Starlight natural site: natural areas where the
13 integrity of the natural conditions, including the
14 quality of the natural night sky, is preserved, and
15 that may include:
 - 16 (A) Habitats of particular relevance that host
17 nocturnal wildlife species particularly sensitive
18 to the loss of night sky quality or vulnerable to
19 the effects of light pollution;
 - 20 (B) Terrestrial and marine areas used as corridors
21 and resting sites by migratory wildlife species



- 1 whose habits and displacement are harmed by glare
2 or loss of natural night light;
- 3 (C) Protected natural areas with a special relevance
4 for the development of night-time environment
5 research and management and the study of the
6 natural patterns of light and dark;
- 7 (D) World heritage properties, biosphere reserves,
8 Ramsar Convention wetland sites, and marine or
9 terrestrial protected areas of international
10 importance; and
- 11 (E) All protected nature areas in general, since all
12 species and ecosystems depend on natural cycles
13 of day and night;
- 14 (4) Starlight landscape: places where aesthetic and
15 cultural manifestations of the night sky can be
16 observed, and that may include:
- 17 (A) Areas where the starry sky, as well as
18 exceptional manifestations of light-related
19 phenomena, can be observed;
- 20 (B) Expressions of nature and geological monuments
21 that create night landscapes of acknowledged
22 value;



1 (C) Cultural landscapes or expressions of natural and
2 artificial works of nature and where the
3 astronomical dimension prevails; and

4 (D) Natural heritage properties and biosphere
5 reserves;

6 (5) Starlight oasis-human habitat: populated areas free
7 from negative effects that impede star viewing and
8 decrease night sky quality and that may include:

9 (A) Rural areas of outstanding singularity where the
10 starry sky view is part of their recognized
11 identity;

12 (B) Small villages that maintain the night sky
13 reasonably free from atmospheric and light
14 pollution; and

15 (C) Tourist destinations that consider the night sky
16 an important resource and that offer activities
17 based on or related to astronomy and the
18 enjoyment of the night sky; and

19 (6) Mixed starlight site: sites that combine two or more
20 categories under paragraphs (1) through (5).

21 SECTION 5. **Statewide lighting law; considerations;**

22 **lighting in zones.** The department of business, economic



1 development, and tourism, with the assistance of the advisory
2 group, shall develop necessary proposed legislation to implement
3 a statewide intelligent lighting and light pollution law taking
4 into consideration the following:

5 (1) Develop rules regulating the requirements of outdoor
6 lighting to guarantee the protection of night sky
7 quality;

8 (2) Incorporate measures to conserve energy and promote
9 responsible outdoor night lighting;

10 (3) Develop standards for intelligent lighting design in
11 architecture, urban planning, engineering, and
12 infrastructure development;

13 (4) Strengthen statewide commitment to preserving the
14 night sky by adopting intelligent lighting in the
15 public sector;

16 (5) Promote labeling to recognize intelligent lighting
17 fixtures and products;

18 (6) Develop alliances with both public and private
19 entities primarily responsible for outdoor night
20 lighting;

21 (7) Develop measures to avoid obtrusive light and improve
22 the quality of life of local populations; and



1 (8) Educate local residents about existing solutions, as
2 well as the environmental, personal, and energy-saving
3 benefits that intelligent night-sky lighting entails.

4 SECTION 6. **Report; advisory committee terminated.** (a)
5 The department of business, economic development, and tourism
6 shall submit a final report to the legislature no later than
7 twenty days prior to the convening of the regular session of
8 2010. The report shall include findings, recommendations, and
9 necessary proposed legislation to implement this part.

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

12 **PART III**

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



S.B. NO. 536
S.D. 1
H.D. 1
C.D. 1

Report Title:

Starlight Reserve; Statewide Lighting Law; Light Pollution

Description:

Requires department of business, economic development, and tourism, assisted by a temporary advisory committee, to develop a statewide starlight reserve strategy, including an intelligent statewide lighting law, to preserve the quality of the night sky and its associated cultural, scientific, astronomical, natural, and landscape-related values. (CD1)

