



# Dark Sky Manual

## For Homeowners

**Utah State Parks**



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## Thank You

Thank you for taking the initiative to learn more about how to make your home more dark sky friendly. The first step is education. Then action. Then reaping the benefits of decreasing light pollution by better health to yourself and those around you. The ultimate benefit is to be able to see the stars! When you are successful in making changes to your home, we would love to hear about it! Send photos to [jordanelle@utah.gov](mailto:jordanelle@utah.gov) or to [pattirose@utah.gov](mailto:pattirose@utah.gov). We at Utah State Parks are committed to protecting our natural resources on the ground and above. Please feel free to let us know how this document can be improved.

## Acknowledgement

Most of the technical information gathered in this document was obtained from the International Dark Sky Association's website; <http://www.darksky.org/>. The organization is a great resource and they have done a fantastic job on the site. Please take the time to check it out.

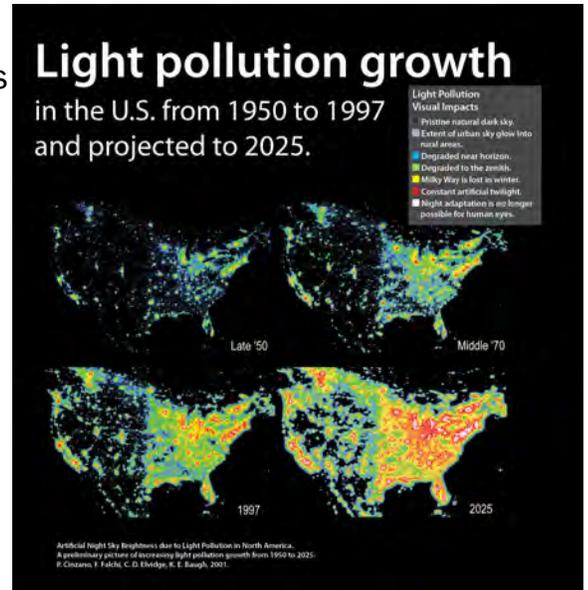


# Why Dark Skies Matter

The Milky Way is vanishing from urban neighborhoods at an astonishing rate. Dark sky friendly choices can eliminate light pollution and provide:

- ✓ Better sleep
- ✓ Better night vision and safety
- ✓ Courtesy between neighbors
- ✓ Brilliant views of the stars

Light pollution is the excessive use of artificial light.



## Light pollution?

Excessive use of artificial light.



**Light trespass** – light falling where it is not intended, wanted or needed.



**Glare** – visual discomfort from excessive brightness.



**Clutter** – Bright, confusing and excessive groupings of lights.



**Urban sky glow** – the brightening of the night sky from artificial lights over inhabited areas.

## Exposure to Artificial Light at Night Can Harm Your Health

Humans evolved to the rhythms of the natural light-dark cycle of day and night. The spread of artificial lighting means most of us no longer experience truly dark nights.

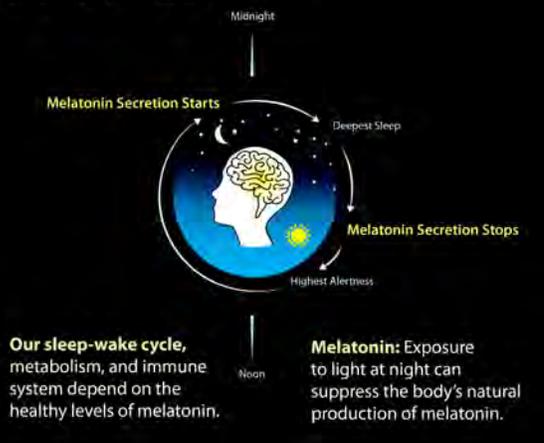
Research suggests that artificial light at night can negatively affect human health, increasing risks for obesity, depression, sleep disorders, diabetes, breast cancer and more.

### Circadian Rhythm and Melatonin

Like most life on Earth, humans adhere to a circadian rhythm – our biological clock – a sleep-wake pattern governed by the day-night cycle. Artificial light at night can disrupt that cycle.

Our bodies produce the hormone melatonin in response to circadian rhythm. Melatonin helps keep us healthy. It has antioxidant properties, induces sleep, boosts the immune system, lowers cholesterol, and helps the functioning of the thyroid, pancreas, ovaries, testes and adrenal glands. Nighttime exposure to artificial light suppresses melatonin production.

## Day-night cycle and human health



# Why Dark Skies Matter

Not only is there a Human health element, there is a wildlife one too. Wild areas need true darkness. An animal's ability to forage, hunt, migrate, and sleep relies on the rhythm of daylight and natural darkness. Dark sky friendly lighting helps our wild area stay dark.

## Wild areas need true darkness

Urban sky glow extends far beyond the borders of cities. Night-friendly lighting helps wild areas stay dark.

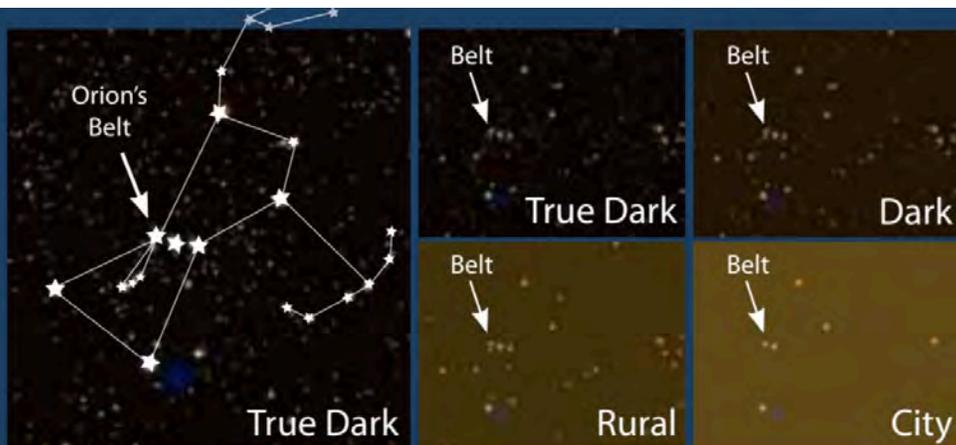
**Hunting and foraging:** Lack of natural darkness decreases nocturnal activity, causing hunger, weight loss, mating decline, and decreased population.



**Declining insect populations:** The disappearance of bugs negatively impacts all species that rely on insects for food or pollination.

**Migration:** Artificial lights can cause migrating animals to wander off course and never reach their natural destinations.

**Shelter:** Natural darkness provides safe places for animals to hide, live, and raise young.



Can you see the constellation Orion from your home?



# Outdoor Lighting Basics

Modern society requires outdoor lighting for a variety of needs, including safety and commerce. IDA recognizes this but advocates that any required lighting be used wisely. To minimize the harmful effects of light pollution, lighting should

- Only be on when needed
- Only light the area that needs it
- Be no brighter than necessary
- Minimize blue light emissions
- Be fully shielded (pointing downward)

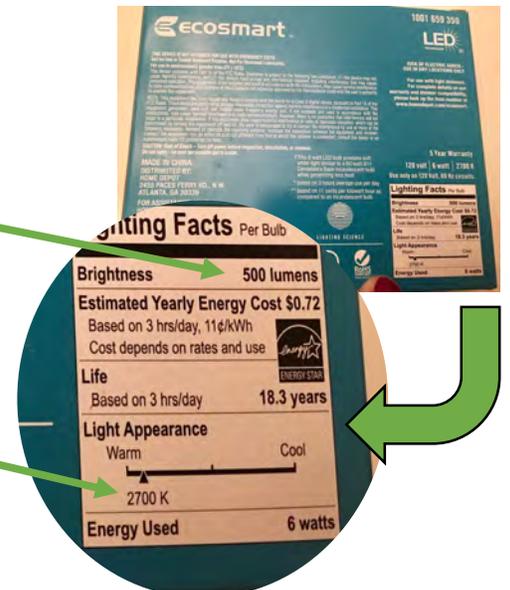
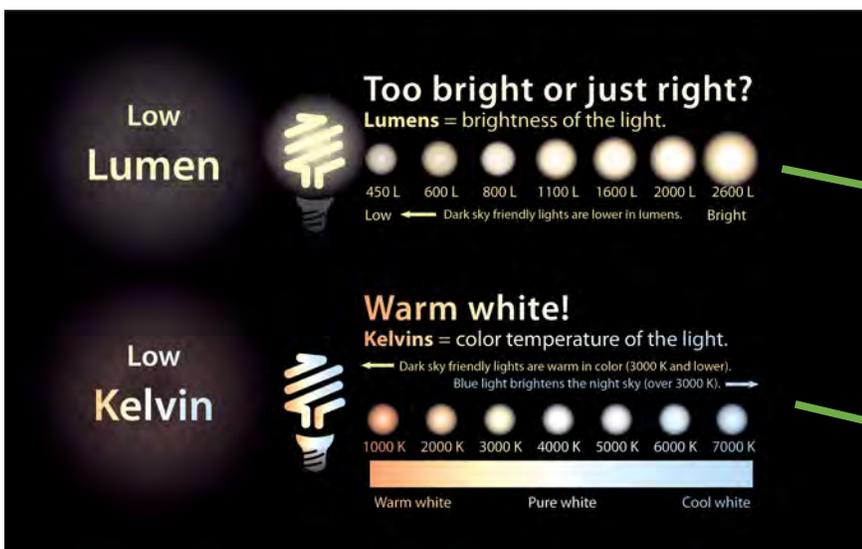
The illustration on page 6 provides an easy visual guide to understand the differences between unacceptable, unshielded light fixtures and those fully shielded fixtures that minimize skyglow, glare and light trespass.



## Choosing the Right Bulb

Be sure to look at the packaging. All packaging for new CFL and LED light bulbs provide color temperature information. Use low color temperature light sources for interior and exterior light. Their light is less harsh and less harmful to human health and the environment. Look for warm white sources with a color temperature of 3000K or lower.

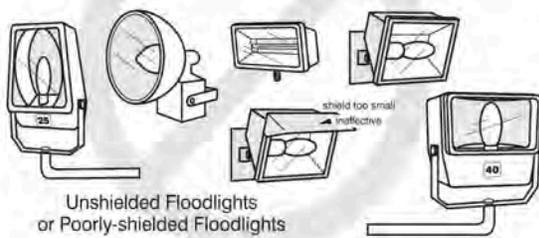
The Kelvin temperature chart below shows you what the numbers mean.



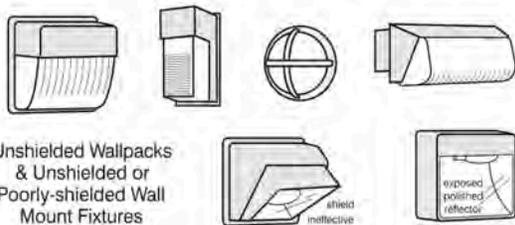
# Examples of Acceptable / Unacceptable Lighting Fixtures

## Unacceptable / Discouraged

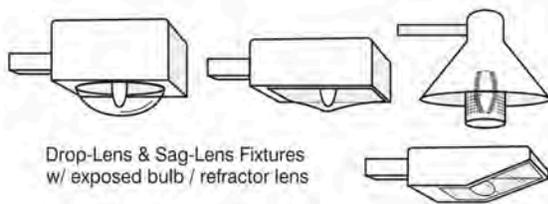
Fixtures that produce glare and light trespass



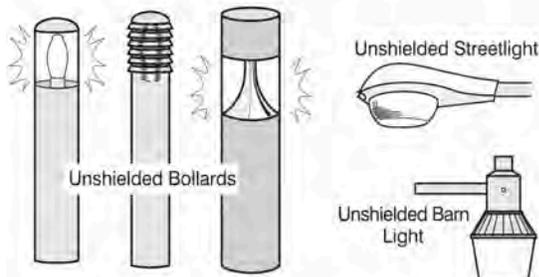
Unshielded Floodlights or Poorly-shielded Floodlights



Unshielded Wallpacks & Unshielded or Poorly-shielded Wall Mount Fixtures



Drop-Lens & Sag-Lens Fixtures w/ exposed bulb / refractor lens



Unshielded Streetlight

Unshielded Bollards

Unshielded Barn Light

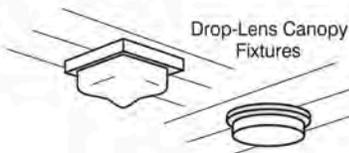


Louvered 'Marine' style Fixtures

Unshielded 'Period' Style Fixtures



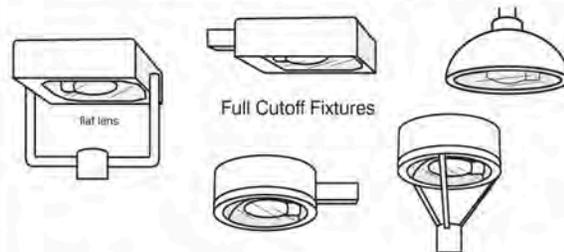
Unshielded PAR Floodlights



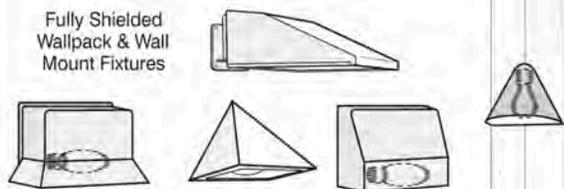
Drop-Lens Canopy Fixtures

## Acceptable

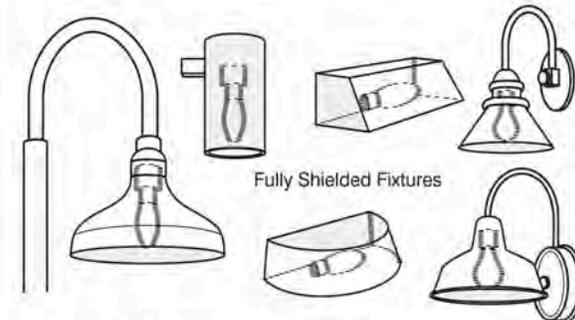
Fixtures that shield the light source to minimize glare and light trespass and to facilitate better vision at night



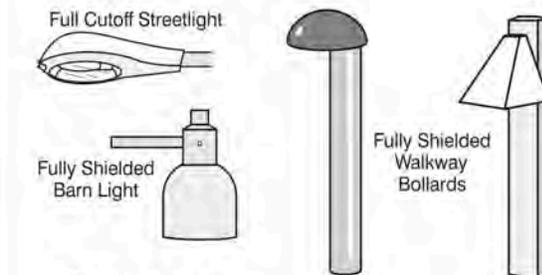
Full Cutoff Fixtures



Fully Shielded Wallpack & Wall Mount Fixtures



Fully Shielded Fixtures



Full Cutoff Streetlight

Fully Shielded Barn Light

Fully Shielded Walkway Bollards

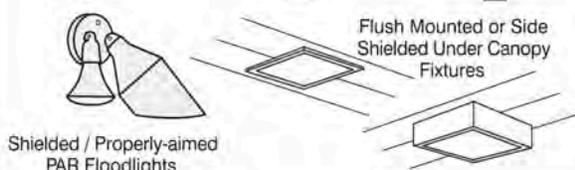


Fully Shielded Decorative Fixtures

bulb shielded in opaque top

Fully Shielded 'Period' Style Fixtures

bulb shielded in opaque top



Shielded / Properly-aimed PAR Floodlights

Flush Mounted or Side Shielded Under Canopy Fixtures

Illustrations by Bob Crelin © 2005. Rendered for the Town of Southampton, NY. Used with permission.

# Checklist



Use warm white sources (bulbs) with a color temperature of 3000 Kelvin or lower. Most lighting products provide this information on their package labeling.



Light only where you need it.



Light only when you need it. Turn off the lights when not in use.



To save energy, don't use excessive amounts of illumination.



Use timers, dimmers and motions sensors whenever possible.



Use only "full cut-off" or "fully shielded" lighting fixtures and direct it downward. That means no light above the 90-degree angle. Fully shielded lighting can be purchased or retrofitted.



Use energy-efficient lighting sources and fixtures.



Keep indoor lights inside. Close blinds and curtains when indoor lights are on at night.



# Examples of Dark Sky Homes

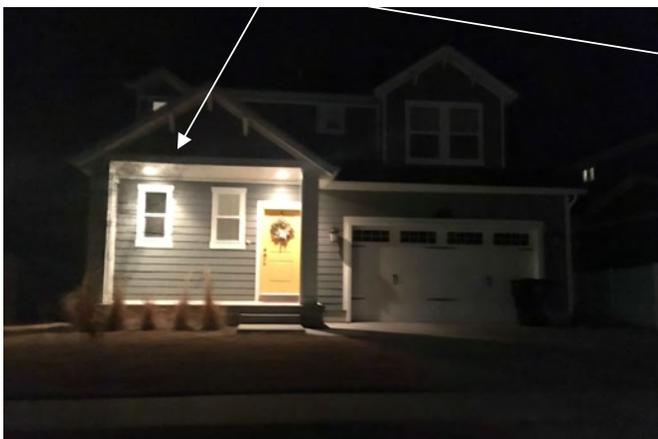
Here are some local examples.



Shielded lights.



Use of can lights over porches.



# Resources

## International Dark-Sky Association

<http://www.darksky.org/>

## Outdoor Lighting Basics

<http://www.darksky.org/lighting/lighting-basics/>

## Samples of Community Lighting Ordinances

<http://www.darksky.org/lighting/lighting-ordinances/>

<http://www.darksky.org/lighting/model-lighting-laws-policy/>

## Considerations for Residential and Business Lighting

<http://www.darksky.org/lighting/residentialbusiness-lighting/>

## Section on "My Neighbor's Lighting"

<http://www.darksky.org/lighting/my-neighbors-lighting/>

## Public Outreach Materials

<http://www.darksky.org/resources/public-outreach-materials/>

## Dark Sky Resource Question and Answers

<http://www.darksky.org/resources/faq/>

## Find Dark Sky Friendly Lighting

<http://www.darksky.org/fsa/fsa-products/>