



Northumberland National Park

Northumberland International Dark Sky Park

Good Practice Guide for Outside Lighting in Northumberland International Dark Sky Park (DSP)

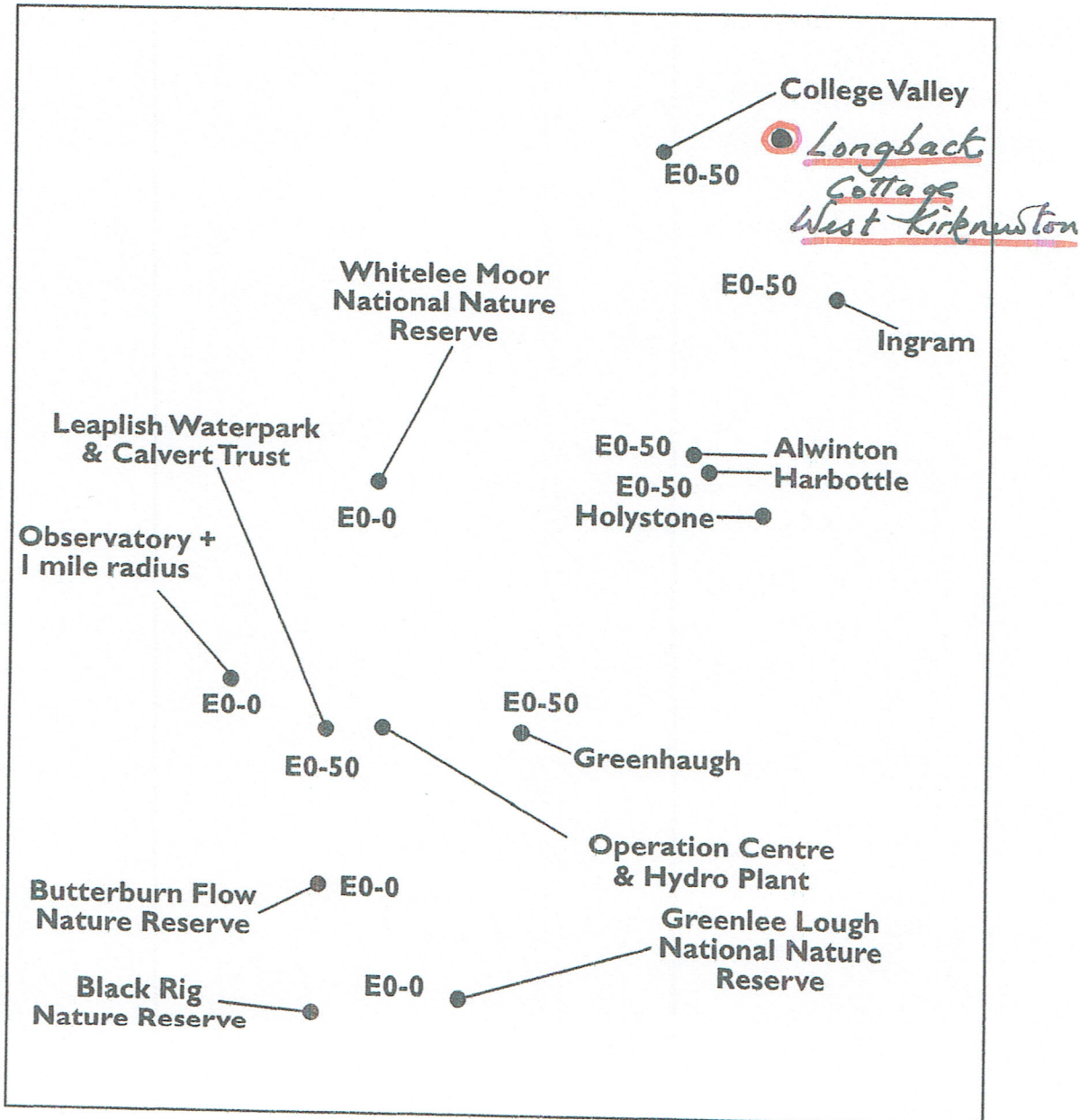
It is official; Northumberland has the darkest skies in England, where everyone has the opportunity to view the galactic beauty of the night sky including the Milky Way. This is an increasingly rare quality that is in danger of disappearing due to the gradual encroachment of light pollution, into even the most remote parts of our countryside.

This guidance is for residents and those seeking permission to develop within the Northumberland International Dark Sky Park. It is also relevant to those living beyond the boundary of the Dark Sky Park, who want to play their part in reducing light pollution in their respective areas.

Background:

Northumberland International Dark Sky Park (see map below) encompasses the whole of Northumberland National Park and much of the adjacent Kielder Water & Forest Park. Within this combined area, there is a mosaic of sparsely populated upland moorland and large tracts of coniferous forest, incised by river valleys where isolated farmsteads, small hamlets and villages tend to be found. In relation to categorising the effect that artificial lighting has on this remote, treasured environment, a unique Environmental Zone numbering system has been devised for the purposes of Dark Sky Park designation.

Northumberland International Dark Sky Park (DSP) and Environmental Zones



These Environmental Zones have been determined by the quality of the night-time ambient light found in each zone and the Exterior Lighting Master Plan (LMP) recommends differing degrees of stray light control for each of the five 'Environmental Zones'.

The LMP has assessed the whole of Northumberland International Dark Sky Park as **E0-250**. However, within the Dark Sky Park, there are areas having lower levels of ambient night-light (E0-0) as well as areas of slightly higher levels of ambient night-light (E0-50 & E1).

Summary of Environmental Zones for Northumberland International Dark Sky Park:

Enviro-Zone	Definition	Typical Examples	Implications	Means to Achieve
E0-0	Dark	E.g. Whitelee Moor National Nature Reserve and one mile round Kielder Observatory.	NO NEW EXTERNAL LIGHTS ALLOWED and residents encouraged to modify existing outside lights.	Adapt or modify existing outside lights to this end.
E0-250	Predominantly dark - Some light spill is inevitable up to 250 metres beyond the new light source or up to property boundary whichever is nearer to property.	All remote properties within Dark Sky Park boundary e.g. Isolated houses and farmsteads.	New outside lights must be compliant and residents encouraged to modify existing outside lights to prevent no more than 0.1 lux straying beyond their property boundary.	New outside lights must be fully-shielded regardless of lumen* output (ideally less than 600 lumens). Encourage existing lights to be modified or adapted to this end.
E0-50	Predominantly dark - Some light spill is inevitable up to 50 metres beyond the new light source or up to property boundary whichever is nearer to property.	Settlements with little or no street lighting system e.g. Alwinton Ingram Holystone College Valley Greenhaugh & Lanehead Harbottle.	New units must be compliant and residents encouraged to modify existing outside lights to prevent no more than 0.25 lux straying beyond their property boundary.	New outside lights must be fully-shielded regardless of lumen* output (ideally less than 600 lumens) Encourage existing lights to be modified or adapted to this end.
E1 in E0 area	Intrinsically dark - Up to 0.5 lux light spill is inevitable at the property boundary.	Settlements with a street lighting system e.g. Kielder Village Byrness Falstone Stonehaugh Rochester Elsdon Otterburn Camp.	New units must be compliant and residents encouraged to prevent any light straying into their neighbour's windows by adapting or modifying existing lights to this end.	Residents encouraged to use bulbs with an output less than 600 lumens or ensure new outside lights are fully-shielded if greater than 1,000 lumens.*

E1 Beyond Park Boundary

Up to 1 lux light spill is inevitable at the property boundary inclusive of any contribution from street lighting system.

Residents encouraged to prevent any light straying into their neighbour's windows by adapting or modifying existing outside lights to this end.

Residents encouraged to use bulbs with an output less than 1,000 lumens* and ensure lighting unit is **fully-shielded** if greater than 1,800 lumens*.

* A lumen is the recognised measurement of light produced, not a measurement of the energy of the light source i.e. the higher the number of lumens, the brighter the light.

Features to consider when sourcing new exterior lighting units

Firstly and the most obvious question that you need to ask yourself is 'Do I need artificial lighting at all, and if so how much? For environmental and financial reasons choose the minimum number of fixtures that are required to meet your need. Then consider when and how the light units will be switched on. Rather than a standard switch that requires you to remember to switch the light 'on' and more importantly 'OFF' before going to bed, consider using a time clock or Passive Infra Red (PIR) motion sensor switching mechanisms, or even both! These will help save you money and reduce the risk of unnecessary light pollution occurring.





Brightness of the bulb

You may have noticed that the light bulb industry has been going through a radical change in recent years.

The driving factor behind this is improved energy efficiency and this is being achieved by new technology such as the use of Light Emitting-Diodes (LED's) that require a reduced amount of energy to emit the same brightness of light as old fashioned filament light bulbs. Saving energy should mean that you save money in the long-term also.

Traditionally most people have been used to buying light bulbs (lamps) with the light output graded in units of watts (W). These days, because watts are actually a measure of power not light intensity, manufacturers are tending to refer to the 'Lumen' (lm) output of a bulb. This is simply a measure of the total amount of 'visible' light emitted from a source. The conversion table below identifies the approximate lumen output emitted from light sources of varying wattages. For example a 10w LED bulb produces the equivalent level of brightness (700+ lumens) as a 60 watt standard incandescent light bulb.

Approximate lumen output emitted from light sources of varying wattages

BRIGHTNESS (lumen)	220+	400+	700+	900+	1300+
Standard Bulb 	25 W	40 W	60 W	75 W	100 W
Halogen Bulb 	18 W	28 W	42 W	53 W	70 W
CFL Bulb 	6 W	9 W	12 W	15 W	20 W
LED Bulb 	4 W	6 W	10 W	13 W	18 W

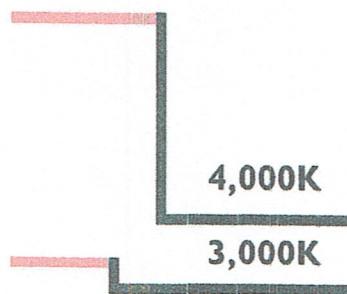
Light Bulbs ← < 600 is better

Colour of the light emitted

Most people probably think that white light bulbs emit the same colour light but in fact there are different tones of white light and this tends to be measured by the 'Kelvin Scale' (K).

Traditionally manufactures have used phrases such as 'warm white', 'brilliant white' or 'Cool White' to distinguish between the different types of white light but with the increased use of LED lighting, packaging for light bulbs these days tends to identify the 'Kelvin' output of the bulb.

The table below sets out some examples of LED and the Kelvin Scale



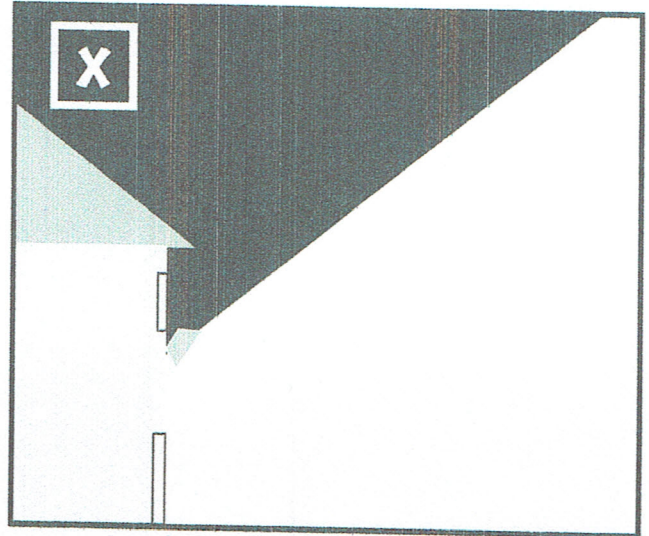
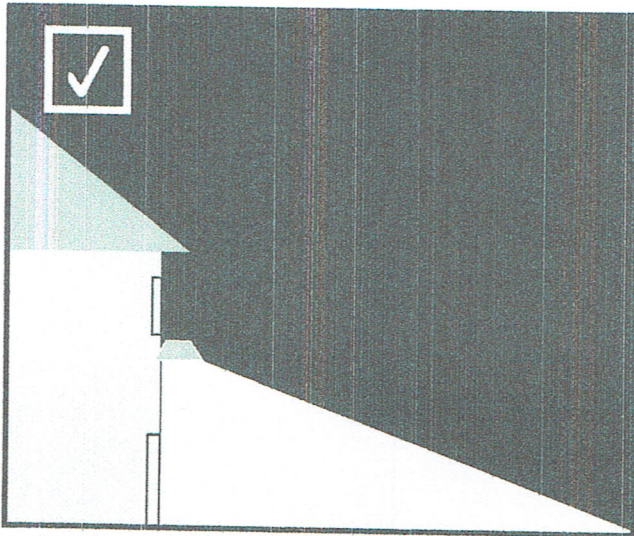
The preference for new exterior lighting within the Dark Sky Park is for bulbs to emit light between the 3,000 – 4,000 Kelvin range thereby avoiding the piercing blue white light often seen on LED Christmas tree lights but also the orange glow effect synonymous with out dated sodium bulb street lighting systems.

Positioning of outside lights

As well as ensuring that the brightness of your outside light is compatible to the relevant 'Environmental Zone'; WHERE and HOW you install your light is just as important.

If flood lighting is unavoidable, ensure that the light shines downwards, with no light escaping above the horizontal plane, and only to where the light is required, and not onto neighbouring property.

Ensure that outside lighting shines downwards



Fully-shielded lights

To be fully compliant with the Dark Sky Park LMP, the glass window of any outside light should be totally horizontal with no light escaping above it.

NOTE: Outside lights that have the bulb tucked out of sight into the lamp casing, but have a glass bowl beneath are NOT Fully-Shielded as the light is refracted upwards from the curvature of the glass. Unshielded bulkhead lights, no matter their luminosity, should never be installed as they waste light in all directions, blinding the person approaching it and shining only a small fraction of light to where it is needed.

Ensure that fully-shielded outside lighting is used

