

The Dark Sky Park Lighting Supplementary Guidance



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Developed in Partnership with



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1. What is the Dark Sky Park and why is it important?

The Galloway Forest Park received the Gold Tier Dark Sky Park Status from the International Dark Sky Association in 2009 due to the exceptional quality of the night sky. This award highlights how clear the night environment is in the Park and gives international recognition to its unique qualities. Due to the continuing increase in light pollution nationally, it is estimated that 80% of the UK's population will never see a true dark sky. The Dark Sky Park is therefore an important and unique natural resource that should be protected.

The Dark Sky Park status helps to attract tourists to South West Scotland, particularly in winter months, due to the clarity of the night sky which is an important consideration for astronomers. The Dark Sky Park in East Ayrshire sits within the UNESCO Galloway and Southern Ayrshire Biosphere, which is also a tourist asset, although it is a separate designation. There is a considerable opportunity to boost tourism further; sustainable and sympathetic development is encouraged by the Local Development Plan policies in order to provide facilities for tourists and strengthen and expand rural businesses.

The Park is home to a large variety of nocturnal wildlife species which thrive on the intrinsically dark landscape. Studies have found that human health and ecosystems can be adversely affected by excessive artificial lighting. Maintaining the quality of the Dark Skies Park will therefore have significant wider benefits for our natural environment.

Lighting and the power it uses is a significant contributor to the carbon emissions we create. The Scottish Government is encouraging reduction of energy use and promoting more energy efficient lighting to reduce overall carbon emissions. A reduction in light usage and an emphasis on using the correct type of lighting for a particular task will help reduce light emissions and help South West Scotland contribute to targets for reducing carbon emissions.

2. What is Supplementary Guidance?

Supplementary Guidance is intended to provide helpful guidance, consistent with the provisions of the Local Development Plan and carries the same weight as the Local Development Plan in determining planning applications.

This Supplementary Guidance supplements the "Dark Sky Park" policy within the Local Development Plan as shown below:

LDP Policy: TOUR 4 - The Dark Sky Park

The Council will support the Galloway Forest Dark Sky Park, and will presume against development proposals within the boundaries of the park that would produce levels of lighting that would adversely affect its “dark sky” status. The boundaries of the Dark Sky Park and of the buffer zone are shown on Map 10. Development will require to be in line with statutory guidance on Dark Sky Park Lighting. This document will include, guidance for proposed developments within the buffer zone which may have a lighting impact on the Dark Sky Park.

The purpose of this Supplementary Guidance is to provide further details on the principles set out in Local Development Plan. Policy TOUR 4: The Dark Sky Park specifically ensures that external lighting is designed and installed correctly in order to protect the quality of the dark sky within the park. The guidance will form an important part of determining planning applications for developments and advertisement consents within the Dark Sky Park. It is to be used by the development industry, development management officers and applicants.

The Supplementary Guidance sets out the type and level of information that should be submitted to enable a proper assessment of the potential impacts of proposals on the Dark Sky Park. Example conditions relating to the control of lighting are also included in the Supplementary Guidance which may be attached to planning permission, where considered appropriate.

External lighting will often not require planning permission. Therefore, a further intention of the Supplementary Guidance is to encourage better design and management of external lighting that does not require planning permission, both within the Dark Sky Park and in the surrounding area, known as the Transition Zone. Even if planning permission is not required, or if existing fixtures are being replaced, those installing the lights are strongly encouraged to read this guidance and adopt Dark Sky friendly lighting practice. Suitable replacement lighting offers an opportunity to enhance the night environment, reduce energy wastage and bring significant cost savings to businesses and individuals.

3. Dark Sky Park & Transition Zone



Dark Sky Park

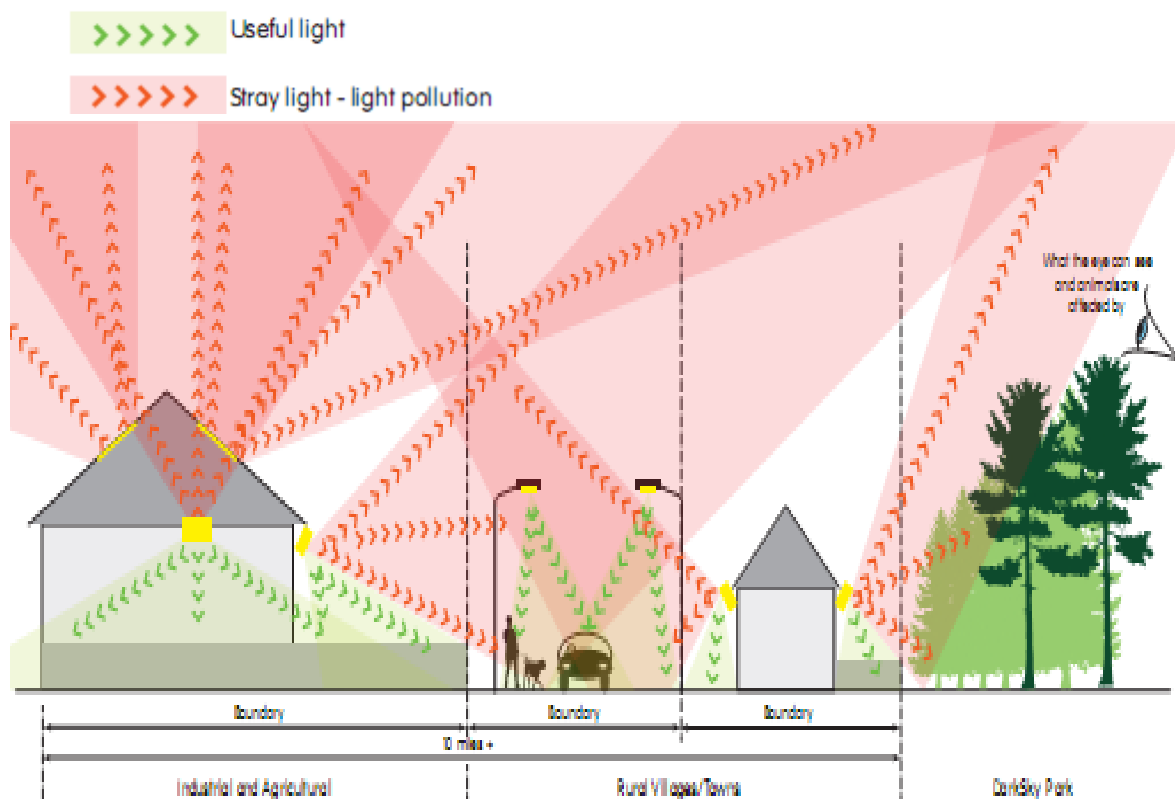
The Dark Sky Park (outlined in Red on the Plan) comprises a Core area (where the darkest sky is to be found) and a Buffer area. The Dark Sky Park includes land mostly within the Galloway Forest Park, as well as Craigengillan Estate which contains the Scottish Dark Sky Park Observatory. The area extends to 75,743 hectares (around 300 square miles) and has few properties or businesses within its boundaries. Therefore any light within the area, depending on the topography, can be particularly conspicuous even from several miles away. Where necessary, a condition to ensure lighting is Dark Sky compliant will be applied to planning permissions granted for developments in the Dark Sky Park.

Transition Zone

Outwith the Dark Sky Park, a Transition Zone has been identified within a radius of 10 miles of the Park. Lighting within this zone can impact on the quality of the dark sky within the Park. It is therefore desirable that all external business and domestic lighting being installed within this zone is “dark sky friendly”. An advisory note will therefore be issued to applicants for planning permission within this zone to encourage all external lighting to be designed and installed to be “dark sky friendly.” An example of this is where a development with “dark sky friendly” lighting may have no impact on the quality of the night sky, but a small development, such as an individual residential property, with poorly designed lighting could have a significant impact across a wide area.

The Effects of Poorly Managed Lighting

Keep your light in your boundary



Lighting which is Dark Sky Friendly will not only prevent light pollution but could also reduce energy wastage, which can offer significant cost savings to businesses and individuals.

The Scottish Government are encouraging reduction of energy use and promoting more energy efficient lighting to reduce overall carbon emissions. The Council will encourage developers to take account of the Dark Sky Park designation and take measures to limit light pollution. Any development that will produce levels of lighting that will have a significant impact on the quality of the night sky and may undermine the Dark Sky status of the park will not be supported.

4. Initial Checklist for External Lighting

It is recognised that external lighting is important for undertaking everyday tasks. The Dark Sky Park award does not mean that no lighting is allowed. Instead, the best lighting solution should be found to both fulfil its purpose and at the same time avoid unnecessary light pollution.

Within the Dark Sky Park, at the outset, when thinking about introducing or replacing external lighting, the following points should be considered:

Question	Yes or no?
Is the proposed lighting necessary at this location?	
Could the development proceed without external lighting?	
Are there alternative measures which may be less intrusive?	
Will there be any upward light pollution from the proposed light?	
Can the proposed light be turned off when not required?	
Is the proposed wattage/Luminaries the minimum required to serve its intended purpose?	
Is the proposed lighting in the correct location and height to light the required area?	
Does the proposed lighting impact on other properties or user groups?	

If you have answered no to any of the questions, you should consider further how your proposed lighting could best support the Dark Sky Park.

5. New Developments which require Planning Permission in the Dark Sky Park

The Council will only be supportive of development proposals or illumination associated with external signage proposals within the Dark Sky Park where they have no significant adverse impact on the overall night sky and natural environment. This Supplementary Guidance sets out the level and type of technical and supporting information that is required to be submitted with a planning application, in order to ensure that a proper assessment of the potential impact on the development proposal on the Dark Sky Park.

All development proposals which fall within the boundaries of the Dark Sky Park boundary will be required to include the following information for any external lighting associated with a planning application:-

- Justification for lighting;
- Layout Plan highlighting the location of the lights within the application site with beam orientation indication for each elevation if applicable;
- Light spillage analysis for each external light;
- Lighting design type- details of light fitting and casing (including details of any cowling to prevent spillage of light above the horizon);
- Mounting Height;
- Light angle;
- Luminaries;
- Hours of lighting operation;

In some instances additional information may be sought by Planning Authorities to assist assessment, such as an independent lighting consultant's assessment of the proposals.

When planning permission or advertisement consent is approved for development within the Dark Sky Park, conditions will be imposed to ensure that lighting does not have unacceptably adverse impacts upon the Dark Sky Park; that the development is implemented in accordance with the approved scheme; and that any altered scheme or additional lighting receives the prior written approval of the planning authority. Example conditions can be found in Appendix 1.

6. New Developments within the Transition Zone

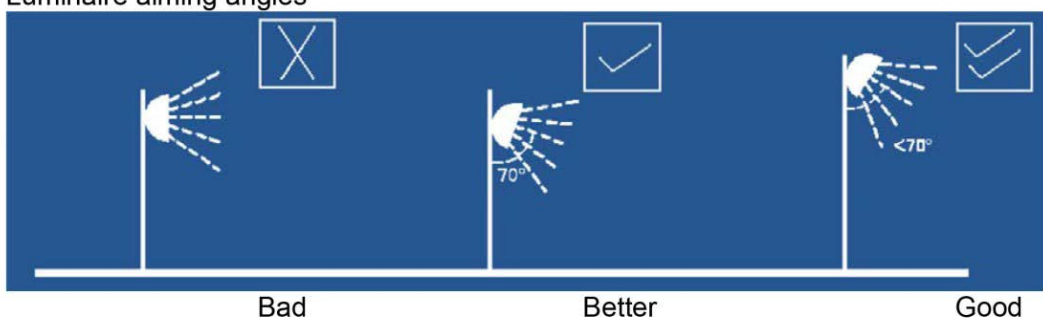
Within the Transition Zone, new external lighting should be Dark Sky friendly where possible, in order to help safeguard and enhance the quality of the Dark Sky Park. With the Dark Sky friendly lighting, proposals adjacent to the park boundary may have no impact on the quality of the night sky, but with poorly designed lighting, proposals that are located several miles from the park could have a significant impact. An example of the advisory note which will be attached to planning permissions within the Dark Sky Park transition zone can be found in Appendix 2.

Where planning permission is not required, individuals and businesses are encouraged to consider the impact of their new and/or replacement lighting on the Park and the wider night time environment and implement lighting proposals that adhere to the 'Good Lighting Practice Guidance' at Section 7. This will help to support the success of the Dark Sky Park, benefiting the natural environment and the local economy of South West Scotland.

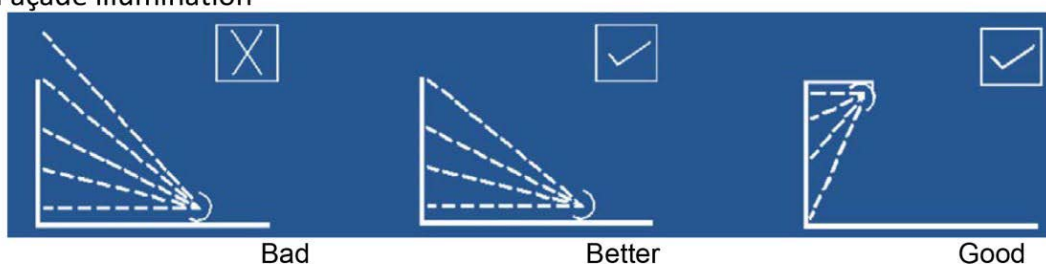
7. Good Lighting Practice Guidance

When selecting external lighting and preparing information to accompany a planning application, the following key requirements should be taken into account

Luminaire aiming angles




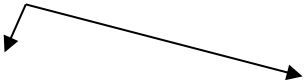

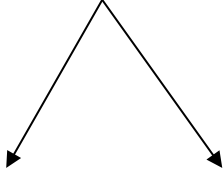

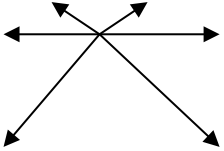
Façade illumination


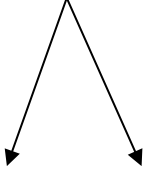


- Light Angle- The light angle of a light is the angle at which the light is distributed or emitted. The light angle you use for any light fitting can make the difference between an appropriately lit object or space and insensitive lighting, which lights a wider space causing light pollution and energy waste. Light angles can be reduced through fitting shields and hoods to ensure only the required area is lit.
- Light cover - Only flat glass covers should be used to prevent the light spreading over a wider angle than is necessary.
- Location of light fitting – The height and position of the light fitting on a building or post, in relation to the space the lighting is trying to illuminate, is critical to ensure no light spillage.
- Installation of light fitting – correct angle and location to ensure no light pollution- light spillage, sky glow or light glare.
- Lighting proposed should be the most efficient taking into account cost, energy use and colour rendering.

Additional good practice guidance can be found in Appendix 3. Further useful information on the Dark Sky Park and lighting design, including a link to the Scottish Government's lighting guide, can be found in Appendix 4.

8. What lighting should be used to support the Dark Sky Park?

<p>Examples of Lighting</p> 	<p>This floodlight has what is known as a double asymmetric light distribution which is less commonly used but is the preferred option in all cases. If installed pointing directly downward (zero degrees of upward tilt) then there will be no upward light at all and the light is forced down and outwards across the area that requires lighting. The glass cover is completely flat with no ridging or curve. The light fall can be illustrated when installed at zero degrees upward tilt as illustrated on the diagram on the right hand column.</p>	<p>Light fall: Perfect</p> 
	<p>This floodlight has what is known as a bi-symmetric light distribution and is commonly purchased from DIY stores. The light from this type of fixture, if not installed correctly, can be extremely intrusive. This type of light fitting should be installed pointing directly downward. Any tilt above zero degrees will result in intrusive light heading unnecessarily into the sky. The usefulness of this flood light is extremely limited. The light fall when installed at zero degrees upward tilt is illustrated on the diagram on the right.</p>	<p>Light fall: Ok</p> 
	<p>Many rural properties such as barns, milking parlours, yards and even houses have flood lights such as this and they often give off a bright orange light. The reflector unit held within the light fitting is bi-symmetric and should be installed facing directly downward. However, the unit also has a curved glass panel on the front to aid with light spread which means even pointing directly downward it will still have an upward stray light content. This is not supportive of the Dark Sky Park.</p> <p>The flood light shown on the left hand side is wrongly installed with a 60 degree upward tilt which is not supportive of the Dark Sky Park. The light fall can be illustrated when installed at zero degrees upward tilt as illustrated on the diagram to</p>	<p>Light fall: Poor</p> 

	the right.	
	<p>A fully cut-off light fitting making a downward cone of light with no stray light. This fitting illuminates a doorway only. This light fitting does not have additional shielding and therefore viewed light may be seen from a distance if in a rural setting but may not be problematic if the light source is less than 1,000 lumens. Front facing shields are available if needed.</p>	<p>Light fall: Perfect</p> 

Appendix 1: Example conditions to be attached to planning permission in the Dark Sky Park

For development within the Dark Sky Park:

Condition relating to general development:

That no development in respect of this planning permission shall take place unless details of any proposed external lighting to be installed within the application site have been submitted to and approved in writing by the planning authority. Such lighting shall be compliant with the lighting advice as contained in the Dark Sky Park Lighting Supplementary Guidance. Thereafter, all the external lighting shall be installed in full accordance with such details as may be so approved. Should any external light or lights within the application site be shown to cause unacceptable light levels or spillage, the planning authority shall be allowed to require the said light or lights to be either removed, relocated or realigned as appropriate, for the lifetime of the development.

Reason: In order to ensure that external light(s) do not adversely impact upon the interests of the Dark Sky Park and to safeguard this national tourism asset.

Condition relating to advertisement signage

The illumination of signage hereby approved shall be installed in compliance with the submitted and approved designs and sited in the approved locations. The approved scheme shall not be altered or other lighting installed without the prior written approval of the planning authority.

Reason: In order to ensure that any lights/ illumination associated with signage does not adversely impact upon the Dark Sky Park and safeguard this national tourism asset.

Due to the height of Wind Turbines and meteorological masts, the Council has a specific condition for these types of developments to reduce their impact on the Dark Sky Park.

Condition relating to Wind turbines / Meteorological Masts:

That no development in respect of this planning permission shall take place unless and until precise details of aviation lighting to be installed on the mast have been submitted to and approved in writing by the Council as planning authority (in consultation with the Ministry of Defence). The said lighting shall be 25 candela equivalent brightness infra-red lighting at the highest

practicable point. The mast hereby granted planning permission shall not be erected or brought into operation unless the required aviation lighting as so approved has been installed on the mast. Thereafter, the said lighting shall be retained in situ for the lifetime of the development in an effective operational condition.

Reason: In order to ensure that external light(s) do not adversely impact upon the interests of the Dark Sky Park, whilst safeguarding aviation interests and public safety.

Appendix 2- Example Advisory Note for Development within the Dark Sky Park Transition Zone

Advisory Note:

The Galloway Forest Dark Sky Park has exceptionally clear and dark night skies and is therefore internationally recognised for these unique qualities. Should any external lighting be required to be installed in association with the new development please contact East Ayrshire Council to determine whether planning permission would be required.

Where planning permission is not required for proposed external lighting, and in order to help protect the unique qualities of the Dark Sky Park, it is recommended that you adopt the lighting measures as contained within the Dark Sky Park Supplementary Guidance when implementing your proposed development. This document can be found on the Council's website at the following address:-

<https://www.east-ayrshire.gov.uk/PlanningAndTheEnvironment/Planning-applications/Planning-guidance/Supplementaryplanningguidance.aspx>

Appendix 3: Details for new and replacement lighting

The table below provides a series of recommendations for lighting practice within the different zones of the Dark Sky Park. These zones cover the entire United Kingdom and have been developed by the Institution of Lighting Professionals (ILP), which is the recognised body for lighting in the UK. These guidelines will be considered for any lighting installation that forms part of a planning application and for lighting which does not require planning permission.

ILP Indicator	Night Time Environment	Typical Environment
E0	Designated Dark Sky Park	This area is presently unique to the Galloway Forest Dark Sky Park and related to the very core of the Park.
E1	Intrinsically dark landscapes	Predominately rural, lightly populated areas which already have a good nocturnal night time dark habitat, which should not be diminished. Includes some smaller settlements
E2	Areas of low district brightness	Rural towns and villages, where there is recognition that light is required for day to day business and life. E2 zone ends where the street lighting ends and E1 begins. Restrictions still apply and certain lights should not be used. Most of the towns and villages surrounding the Dark Sky Park will fit into this.

The table below lists a number of lighting guidelines for the zones (E0, E1 and E2) within the Dark Sky Park and the Transition Zone:

Location and ILP Indicator	Dark Sky Park			
	DSP Core E0	DSP Buffer E1	DSP Transition E1	DSP Transition E2
Agricultural buildings/historic buildings/Art structures	No external lights	<ul style="list-style-type: none"> Fully cut off lights. Additional shielding PIR systems or on/off switches. Switched off after work complete. Follow good design practice check list. No up lighting of buildings or structures or sky beams After 22:00hrs switch off 	<ul style="list-style-type: none"> Fully cut off lights. Additional shielding PIR systems or on/off switches. Always switch off after work complete. Follow good design practice check list. No up lighting of buildings or structures Max 3,500 lumens after 22:00hrs After 22:00hrs switch off or reduce light illumination No sky beams 	<ul style="list-style-type: none"> Fully cut off lights. PIR systems or on/off switches. Always switch off after work complete. Follow good design practice check list. No up lighting of buildings or structures After 23:00hrs switch off or reduce light illumination Maximum 3,500 lumens after 23:00 hrs. No sky beams
New dwelling houses and extensions to dwelling houses	No external lights	<ul style="list-style-type: none"> After 22:00hrs switch off or reduce light illumination No up lighting of buildings or structures Lights to be on PIR/switched off when you are not outside, like lights inside the house See diagrammatic tables for guidance on good illumination. 	<ul style="list-style-type: none"> After 22:00hrs switch off or reduction in light illumination Lights to be on PIR/switched off when you are not outside, like lights inside the house No up lighting of buildings or structures See diagrammatic tables for guidance on good illumination. 	<ul style="list-style-type: none"> After 23:00hrs switch off or reduction in light illumination Lights to be on PIR/switched off when you are not outside, like lights inside the house No up lighting of buildings or structures See diagrammatic tables for guidance on acceptable illumination.
Business & Sport development	No external lights	<ul style="list-style-type: none"> Follow good design practice check list Fully Cut off lights with additional shielding PIR systems or 	<ul style="list-style-type: none"> Follow Scottish Government's Good Design Practice- 20 point checklist Fully Cut off lights and additional shielding. 	<ul style="list-style-type: none"> Fully Cut off lights. PIR systems or on/off switches. Preferably no all-night lighting in

		<p>on/off switches.</p> <ul style="list-style-type: none"> • Switched off after work complete. • Max 3,500 lumens after 22:00hrs • No up lighting of buildings or structures • No sky beams • Use infrared if security is an issue 	<ul style="list-style-type: none"> • PIR systems or on/off switches. • Switched off after work complete. • Max 3,500 lumens after 22:00hrs • Follow good design practice check list. • No up lighting of buildings or structures • No sky beams • Use infrared if security is an issue 	<p>villages</p> <ul style="list-style-type: none"> • Switched off after work complete. • Follow Scottish Government's Good Design Practice- 20 point checklist • No up lighting of buildings or structures • Max 3,500 lumens after 23:00hrs • In designated industrial areas can have 70W lights on all night if full cut-off. Only use higher wattages to meet published standards when work is being done outside • No sky beams • Use infrared if security is an issue
<p>Windfarm development (turbines and anemometer masts)</p>	<p>Maximum of infrared lights</p>	<ul style="list-style-type: none"> • Maximum of infrared lights 	<ul style="list-style-type: none"> • Preferable for maximum of infrared lights to be used 	<ul style="list-style-type: none"> • Preferable for maximum of infrared lights to be used

Appendix 4: Useful Links

It is strongly advised that for full details of lighting in and around the Dark Sky Park the full lighting plan should be read. It can be obtained by downloading it from the Forestry Commission Scotland website at:

www.forestry.gov.uk/darkskygalloway

In conjunction with this the Campaign for Dark skies has produced a lighting guide which can be downloaded at www.britastro.org/dark-skies/guidelines.html

Scottish government links:

"Controlling Light pollution and Reducing Lighting energy consumption" (this contains the 20 point check list):
www.scotland.gov.uk/Publications/2007/03/14164512/0

Institute of Lighting Professionals web links on security and other related topics: <https://www.theilp.org.uk/resources/free-resources/>

South Ayrshire Council's Local Development Plan
[Local Planning Service South Ayrshire Council](#)

Dumfries and Galloway Council's Local Development Plan
[Dumfries and Galloway Council : Local Development Plan](#)

East Ayrshire Council's Local Development Plan
[Development plans and policies](#)

Ministry of Defence website in relation to low flying
www.mod.uk/DefenceInternet/AboutDefence/WhatWeDo/AirSafetyandAviation/LowFlying/

Dark Sky Scotland
www.darkskyscotland.org.uk

Campaign for Dark Skies

www.britastro.org/dark-skies

International Dark-Sky Association

www.darksky.org