

Cranborne Chase Area of Outstanding Natural Beauty

# INTERNATIONAL DARK SKY RESERVE APPLICATION

July 2019



Cranborne Chase  
Area of Outstanding Natural Beauty



# INTRODUCTION

On the next pages, we are proud to present our application to the International Dark-Sky Association to be an International Dark Sky Reserve (IDSR).

We want to say at the outset that we are conscious we are not a 'copybook' application in one respect. We believe the AONB meets all the necessary criteria for night sky quality, public engagement, accessibility, and future progress. Cranborne Chase has wonderfully dark night skies, with 50.36% of readings to date achieving silver level, and 48.45% at bronze level. Local astronomers tell us we have among the best dark skies in the south of England. However, we do not meet the minimum 67% lighting compliance in the proposed core – yet! This is an important threshold. In the face of rising levels of light pollution, there is a need to educate and inform both those responsible for planning lighting schemes and the general public about how good lighting practice can help mitigate and protect against the serious problems light pollution causes. We have been working to achieve this for several years, and are seeing results.

We realise that not yet meeting the target for lighting compliance means that, if successful in our bid, the most likely outcome is provisional status. We see this as a positive opportunity to push forward with ongoing and approved initiatives to improve compliance, in our discussions with

the planning authorities and local community. In Section H of this application (Safeguarding our dark skies: future plans and commitments), we set out a detailed ten year plan for how we intend to achieve the IDA's target of 100% compliance in the core. We would keep this plan under review in a three-year provisional status period as we first move forward to achieving 67% compliance, and will be pursuing the objectives rigorously.

Our good quality night skies are, we believe, because of the low number of streetlights in both the proposed core and buffer, and the low density population (as expected in a largely working rural area), so there are relatively few domestic lights, even if many are non-compliant. Add to this evidence that many, and probably most, domestic lights are turned off at night, and those limited streetlights within the AONB come under a dimming or switch off policy overnight, the nightscape of Cranborne Chase is very dark. We hope this can be taken into account in reviewing our application. The people of Cranborne Chase join us in that hope – the thought of their pride and enthusiasm for our starry skies has kept us motivated on many a cold frosty night driving round the AONB, sky quality meter at the ready!

We are determined to strike forward and achieve the 90% and 100% future targets. The AONB team has taken its time to get to the point of applying to

be an IDSR. This is because, as we have no direct control over planning decisions, we wanted to be confident that our work with the local planning authorities and with the local community had achieved a solid foundation on which to build future progress. With the approved streetlight upgrade across a substantial part of the AONB, and the confirmed input of funding to a major landscape scheme that includes initiatives supporting dark skies, as well as the support expressed by local residents and visitors, we consider we are now ready to take the next steps.



International Dark-Sky Association  
3223 North First Avenue  
Tucson,  
AZ 85719  
USA

July 1 2019

Dear Dr Barentine and Committee Members of the International Dark-Sky Association,

I am very pleased to add my support to the application by the Cranborne Chase Area of Outstanding Natural Beauty (AONB) for the prestigious status of International Dark-Sky Reserve. This ancient landscape with its nestled villages, wooded spaces and open downland is a large haven of 983 square kilometres of rural beauty and tranquillity, and its cap of star-strewn skies is arguably its most wonderful feature. The AONB is within easy reach of two of the most extensive urban areas in England: Southampton/Portsmouth and Bournemouth/Poole, with a combined population of nearly a million people, though visitors come from much further afield to appreciate its stars. On satellite-based light pollution maps it appears as the darkest expanse of land in South Central England. As such it is a precious natural asset within its region.

I live at the edge of the AONB and have many times ventured into its heart for casual stargazing, night sky photography, and public starwatches organised by the AONB and the Wessex Astronomical Society. One of my fondest memories from my evenings on the AONB was showing an Australian friend the northern constellations, which she had never seen before, from near the village of Witchampton. Glittering starfields and the Milky Way above were mirrored in the grass at our feet by an extra constellation: a small gathering of glow-worms. She declared it the happiest time of her holiday in Britain.

I have over the last few years been in regular contact with the staff of the AONB and have marvelled at the hard work and dedication they have lent to the goal of preserving the darkness of their area. Their enthusiasm has inspired many local astronomers to lend support to their dark-skies work by taking measurements and photographs in various localities and by participating in events to which the general public come in large numbers. This is an illustration of the desire of people, many of whom are not astronomers but realise what they have lost through the depredations of light pollution, to come and enjoy these events even under cloudy skies, merely to hear a talk, and look at telescopes rather than through them! I know that this is a national trend: as coordinator of the British Astronomical Association's Commission for Dark Skies, I have attended events all over the UK where the public have been invited to see the stars; at the University of Surrey/Guildford Astronomical Society starwatch at Guildford Cathedral last year, it was raining, yet 650 people turned up. The ever-growing desire in the public mind to commune with stars is a reality.

I am very well acquainted with the character of the AONB's rural spaces and the positive collaboration and focus of its personnel who care for them. I am sure that, should the prized status of IDA Dark Sky Reserve be bestowed upon the Cranborne Chase AONB, it will continue to be, and indeed thrive as, a haven for viewing the Milky Way, the constellations and the unending dance of the Moon, planets and flashing meteors. The aims of the IDA and other world dark-sky movements will long be the norm here: promotion of the optimum night sky through thoughtful stewardship, education, and responsible lighting policies.

I met the late Dr David Crawford here in Wimborne not long after the founding of the IDA, and we spoke of the importance of the night to both humans and to the rest of nature, with healthy lighting practices the guarantor of its benefits. I remember him talking about our 'crowded little country' and the great challenge before us. He would be delighted by the progress that has been made in the United Kingdom since those days in raising awareness of the value of the night. The Cranborne Chase AONB will play a noble part in the continuation of that worthy aim.

Sincerely,

**Bob Mizon** - Coordinator, Commission for Dark Skies

IDA lifetime member

Holder of the IDA's Executive Director's Award, Lifetime Achievement Award and European Galileo Award.

38 The Vineries  
Wimborne,  
Dorset BH21 2PX  
United Kingdom  
+44 1202 887084  
bob.mizon@yahoo.co.uk



## ***Cranborne Chase Area of Outstanding Natural Beauty***



To: The President of the Board of Directors  
International Dark-Sky Association  
3223 N. First Avenue  
Tucson  
Arizona 85719  
USA

20 May 2019

Dear President and IDA Board Directors

### **Cranborne Chase AONB's application to be an International Dark Sky Reserve**

On behalf of the Cranborne Chase Area of Outstanding Natural Beauty (AONB) Partnership Board, I write to express our unanimous support for the AONB's application to become an International Dark-Sky Reserve.

The importance of Cranborne Chase AONB is, of course, not just about its daytime natural beauty and scenery. Its night sky, full of stars and with clear views of the Milky Way, is fundamentally and inherently important to the AONB's character and heritage.

On becoming Chairman of the AONB Partnership Board in 2018, I was quickly brought up to date on the wealth of work undertaken by Linda Nunn, the AONB Director, and her team to promote the wonderful night skies of Cranborne Chase. They have run stargazing events, engaged with local schools and other groups, and promoted the benefits of dark skies to the local community, including farmers and tourism businesses. They have also been fully committed to working with the nine local planning authorities in promoting the best outcomes in dark-sky-friendly lighting. I have been hugely impressed to discover the team's obvious energy and perseverance over a number of years, as well as the engagement and support of the local community.

As an AONB, our vision is to support our national Government's pledge that "we must be the first generation to leave the environment in a better state than we found it." I believe that protecting our night skies is as key to achieving this as is the work we do to protecting our landscape of fields, downs and escarpments.

If our bid to be an International Dark Sky Reserve is successful, it will provide unequivocal evidence to boost our ongoing campaign for, and in defence of, our night skies.

Yours sincerely

Nicholas Gosse  
Chairman, Cranborne Chase AONB Partnership



▲ Comet Wirtanen from near Witchampton in Cranborne Chase AONB.  
(© Bob Mizon)



## **Cranborne Chase Area of Outstanding Natural Beauty**

To: The President of the Board of Directors  
International Dark-Sky Association  
3223 N. First Avenue  
Tucson  
Arizona 85719  
USA

20 May 2019

Dear President and IDA Board Directors

### **Chasing stars in Cranborne Chase AONB: International Dark Sky Reserve application**

I am proud to present to you Cranborne Chase Area of Outstanding Natural Beauty (AONB)'s application to be an International Dark-Sky Reserve.

The AONB team and I are passionate about our dark night skies. We like to remind people that, after all, 50% of the AONB's landscape is above our heads. I have worked for the AONB for almost 20 years, and have loved its wonderful landscapes and character from the beginning. Even so, there is little to beat a clear and deep night sky over Cranborne Chase, with thousands of stars, the Milky Way, Orion's Nebula, and even the Andromeda galaxy on clear night, visible in all their glory.

We are hugely fortunate that there are several keen astronomers active in Cranborne Chase, not least the Wessex Astronomical Society. Their members have been a huge support to us, in taking sky quality meter readings on frosty nights, supporting us at our stargazing events, giving presentations, and with quiet encouragement whenever we got somewhat overwhelmed by the task ahead.

We believe our night skies are among the darkest in southern England. Despite this, we are aware that this is not a 'copybook' application. We are conscious that the AONB is not perfect in terms of compliant lighting, although tangible and robust improvements have been and continue to be made. The AONB does not have the ultimate responsibility for planning decisions on new developments or retrofits, or for writing local planning policy. Importantly, however, the local planning authorities are required to demonstrate how they have taken the nationally designated status of this AONB into account in their decisions. Indeed, policies within the AONB Management Plan are formally adopted as local authority policies. Nonetheless, this planning position sets us apart from the International Dark Sky Reserves already designated in the UK, all of which are or are within National Parks, and which are planning authorities in their areas.



In this context, we are also aware that a number of other AONBs in the UK are considering applying for International Dark Sky designation. Bodmin Moor in Cornwall AONB has already been successful. However, our application would be the first from an AONB which deals with multiple planning authorities, and is therefore something of a testing ground for how feasible it is for an AONB, without direct planning control, to achieve status by meeting the high standards and important criteria set by the IDA, and protect our dark night skies. We expect other AONBs across the country are watching us!

While the lack of direct planning 'clout' has given us a pretty large challenge, it has ultimately proved a tremendous opportunity. What we did not appreciate at the start of embarking on this voyage, but have come to realise, is that the real project has not lain solely in what we as an AONB can do. Rather, it lies in demonstrating how much can be achieved by impassioning others about the wonders of dark night skies. If people – whether local authority planners, lighting designers or local residents – become engaged with and excited by the beauty of the stars, and the many benefits of reducing light pollution, then that's more than half our work done. As an AONB, we always strongly encourage and urge decision makers to accept our recommendations, and have gently (and sometimes not so gently!) pushed towards our dark sky objectives. This has borne good fruit on many occasions, but we're not all the way there yet. However, we can now foresee a time when it is others who are taking the lead, and our role becomes increasingly one of guidance and encouragement. That would be quite a success story in itself, and with lots of benefits for our dark skies.

Together with the local planning authorities, we are therefore delighted to have come so far. Indeed, two major developments are currently being planned. The first is a housing development of 170 dwellings just inside the AONB boundary (and therefore in our proposed buffer zone) which will incorporate dark-sky-compliant lighting. The second is a major upgrade of street lighting across some 60% of the AONB (the portion covered by Wiltshire Council, one of the local authorities), which will be compliant with IDA criteria. The fingerprints of the engagement we have had with the local authorities can be traced through both these initiatives, going back to face-to-face discussions, phone conversations and planning authority meetings.

Ultimately, though, this is all about making things better for wildlife and for our local community, for benefiting the local economy through astrotourism, saving energy and money, and providing education and recreation for all to enjoy. Most of all, it's about getting out there and gazing at the night sky.

Personally, I want to make sure it's always possible to go chasing stars in our beautiful Cranborne Chase.

Yours sincerely

**Linda Nunn** - AONB Director



# PREFACE

## Five thousand years of star-filled history

**Imagine.** It is five thousand years ago, a clear, moonless night. You stand beside a Neolithic henge. Its circular bank, ditch and wooden buildings lie dim in the darkness, but starlight glimmers on the river nearby. The Milky Way blazes above you in an arc of brilliance, and the sky is kindled by thousands upon thousands of gleaming stars.

**Now come forward to the present.** The ancient henge still stands, grass-covered and less impressive than when first built, and at its centre the remains of a twelfth-century church. This is Knowlton, in the middle of Cranborne Chase in the south of England. Millennia of history and legend mark this place, from the enigma of its ceremonial pagan origins, to the building of the small church, now a ruin. As you stand there in the darkness, it is owls and small night animals that keep you company, not worshippers, whether pagan or Christian. Nonetheless, beneath your feet, while people may have altered how they use the land since the henge was first constructed, it is, essentially, the same earth. And, above, there are still the stars. Their radiance does not reach our eyes quite so brightly in this modern era, and they have shifted position a little with the tilting of the Earth's axis. Even so, were we able to reach out and join hands with our Neolithic ancestors, standing together by the henge at Knowlton in the dark of the night, we would know the same stars.

In making this application to the International Dark-Sky Association, we present data, information and analysis in abundance supporting our bid to be an International Dark Sky Reserve (IDSR). It is important to us, though, that we do not lose sight of the underlying reason for the bid, the reason why we want to protect our dark night skies over Cranborne Chase. It is grounded in preserving this sense of history, the continuity of time connecting the distant past, the present, and the future, with the night sky forming a connecting trail as people come and go, leaving their footprints beneath the stars.



## Fifteen years on the road to this application

When we are asked why it has taken us fifteen years to travel from our original desire to protect our dark night skies to making an application to be an IDSR, we reply with pride rather than excuses. Cranborne Chase Area of Outstanding Natural Beauty (AONB) is not a 'textbook' dark sky reserve, even though we believe it has some of the darkest night skies in the south of England. More to the point, the legal framework within which AONBs are designated and operate means that they are not planning decision-makers. Instead, they need to work alongside and influence others, at local, regional and national level. That takes time, effort and determination.

We make this application at a time of change and opportunity. The Government's 25-year plan for the UK's environment, A Green Future, was published in 2018. The plan reaffirmed a commitment to conserving natural beauty in the UK, and to the importance of AONBs in achieving this.

Cranborne Chase is one of 46 AONBs in the UK, and is the sixth largest. As an AONB, it is recognised as one of the nation's finest landscapes, and is given statutory protection in order to conserve and enhance its natural beauty. It is nationally important.

It is internationally important, too. AONBs are recognised as Category V Protected Landscapes by the International Union for the Conservation of Nature (IUCN). They also fall under the remit of the European Landscape Convention, a Treaty devoted exclusively to the protection, management and planning of all landscapes in Europe. The Treaty places a particular emphasis on the need for co-operation in undertaking programmes of landscape work that cross administrative and national boundaries.

That last statement hides a wealth of complexity – but also of innovation and opportunity – that has characterised Cranborne Chase AONB's fifteen-year endeavours in championing dark skies across its landscapes. AONBs are not planning authorities – they have no power to make planning decisions. This is the key legislative status that differentiates them from National Parks in the UK, which do have this power. AONBs must instead seek to influence and inform the planning policies and decisions made by local authorities – the County-level and District-level Councils that have jurisdiction over planning decision-making in an AONB's area. While some AONBs have a single planning authority covering their boundaries, others collaborate with more than one. Here in Cranborne Chase AONB, we collaborate with seven, each with their own set of priorities.

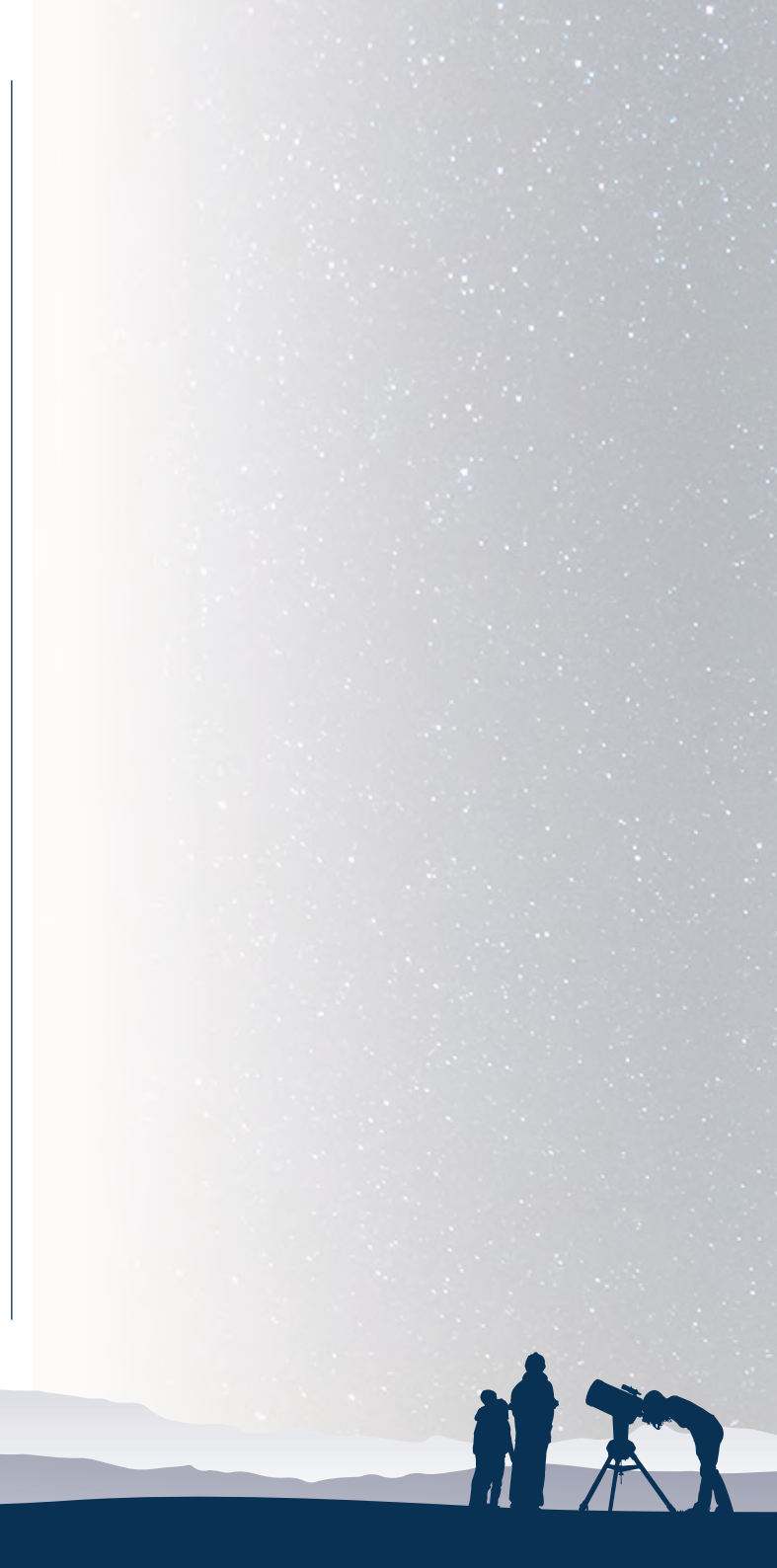


This is the reason for our pride in the fifteen years of progress to get to this point. That's how long it takes. Not to put together an application, but to persuade local authorities to effect change that positively reduces light pollution. Not to impose regulations, but to encourage, inform and ultimately be awed by a bottom-up community drive to value, protect and marvel at our wonderful dark night skies. To date, we are the only prospective dark sky reserve in the UK that has had to tackle these particular planning challenges, making our project extraordinary in the national context. We have been rewarded by a growing awareness of, interest in, and respect for the importance of reducing light pollution, as expressed by our local authority partners and local people, who are increasingly taking the reins and driving this initiative forward. This has resulted in practical actions over the last few years, and continues to do so. There is work to do, but much has been achieved, and we feel the AONB is now ready to apply for this prestigious designation.

## And next...

If we are successful in achieving IDSR status, then the work (after a celebration) would continue. In this application, we set out in detail our future plans (Section H). We know that the people of our local communities would be overwhelmingly proud to be a dark sky reserve, and will join, and increasingly lead us in taking the initiative onwards.

We are also confident that our Neolithic forebears, standing on the Knowlton henge all those millennia ago, would recognise our persistence to succeed, and share our delight in the star-filled night skies of Cranborne Chase.





## Abbreviations used in this document

<b>AONB</b>	Area of Outstanding Natural Beauty
<b>BAA</b>	British Astronomical Association
<b>CCT</b>	Correlated Colour Temperature
<b>CCWWD AONB</b>	Cranborne Chase and West Wiltshire Downs AONB
<b>CfDS</b>	The Commission for Dark Skies
<b>CFL</b>	Compact fluorescent lamp
<b>CPRE</b>	Campaign to Protect Rural England
<b>CRoW Act 2000</b>	Countryside and Rights of Way Act 2000
<b>Defra</b>	Department of the Environment, Fisheries and Rural Affairs
<b>ELC</b>	European Landscape Convention
<b>FG</b>	Flat glass
<b>HE</b>	Highways England
<b>HLF</b>	Heritage Lottery Fund
<b>IDA</b>	International Dark-Sky Association
<b>IDSR</b>	International Dark Sky Reserve
<b>ILP</b>	Institution of Lighting Professionals
<b>IUCN</b>	International Union for the Conservation of Nature
<b>LDP</b>	Local Development Plan
<b>LMP</b>	Lightscape Management Plan
<b>LPA</b>	Local Planning Authority
<b>LPS</b>	Landscape Partnership Scheme
<b>NDP</b>	Neighbourhood Development Plan
<b>NFU</b>	National Farmers' Union
<b>NNR</b>	National Nature Reserve
<b>SAC</b>	Special Area of Conservation
<b>SNCI</b>	Site of Nature Conservation Importance
<b>SQM</b>	Sky Quality Meter
<b>SSSI</b>	Site of Special Scientific Interest
<b>WAS</b>	Wessex Astronomical Society

This application document was compiled by **Amanda Scott**, Dark Sky Advisor with Cranborne Chase AONB, and **Malcolm Mackness** IEng, Fellow of the Institute of Lighting Engineers (Sections E and F).



## Acknowledgements

We are immensely grateful to the following people and organisations for their support, practical assistance and encouragement to us in preparing this application, and all the work leading up to submission.

**Bob Mizon**, of the Commission for Dark Skies, for leading events, talks and presentations, promoting our dark skies, and for imparting his unfailing enthusiasm for the glories of the night sky.

**Malcolm Mackness**, professional lighting engineer, for all his work tramping the roads of the AONB for the external lighting survey, and his expertise in preparing the lighting audit and Lightscape Management Plan.

**Richard Burden**, landscape planning professional and Principal Landscape and Planning Officer for the AONB, for persistently pursuing the cause of dark sky friendly lighting and the importance of the night sky to our landscape.

**Wessex Astronomical Society members**, for supporting our astro events with their expert input to engage the public, taking dark sky readings on many a cold night, and for welcoming us into their astro family.

**Jo Richardson**, ESERO-UK Space Ambassador, for her work over three years for us in schools, running Space Detectives virtual reality workshops; and also for all the schools and local youth groups who have enjoyed exploring the night sky.

**Paul Howell** of Pictor Images, astrophotographer, for his wonderful images of our dark night skies.

**Dan Oakley** of South Downs National Park for advice on the application and survey methodology.

**Richard Broadway**, for making the final submission look smart and professional.

**Stuart Brown** and **Rod Mainstone**, of Wiltshire and Dorset Councils respectively, for providing data for the external lighting audit.

**Adam Dalton** at the IDA for helpful feedback as we formulated our application.

**The Fordingbridge Astronomers, Sutton Veny Astronomy Group, Martin Down Astronomers**, and **Weymouth Astronomy Club** for supporting our cause enthusiastically.

**Local parish and town councils** who have greeted our dark sky proposals with enthusiasm.

**Fonthill Estate Management**, for permission to access their site for the external lighting survey.

Finally, thanks to the many, many people, both local residents and visitors, who have signed our dark sky pledge and expressed such huge delight in the night skies of Cranborne Chase AONB.

### *Photo credits*

The photograph on the front cover of this application is of Knowlton Church (© Paul Howell / Pictor Images). The photographs between each of the Sections are also © Paul Howell, and are taken at eight of our top ten stargazing locations. The locations pictured are:

Badbury Rings (page 15)

Dinton Park (page 28)

King Alfred's Tower (page 34)

Knowlton Church (page 57)

Martin Down (page 65)

Melbury Downs (page 104)

The Ox Drove (page 128)

Win Green (page 147)



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# MEETING THE ELIGIBILITY AND MINIMUM REQUIREMENTS

## Eligibility requirements

Summary of IDA eligibility requirement	How the AONB meets the requirements
<p><b>A</b> The core of the proposed IDSR must be public or private land protected for scientific, natural, educational, cultural, heritage and/or public enjoyment.</p>	<p>Cranborne Chase is an AONB, a nationally statutorily designated protected landscape. The primary purpose of the designation is to conserve and enhance the natural beauty of the area, including both public and private land within its boundary. It is also internationally protected, including being recognised as a Category V Protected Landscape by the IUCN. Working with its partners, the AONB promotes scientific, heritage, access, awareness and understanding, and educational opportunities. The Countryside and Rights of Way Act 2000 empowers local planning authorities to undertake whatever is needed to conserve the AONB's landscape, and confers on AONBs the equivalent status to a National Park.</p>
Summary of IDA eligibility requirement	How the AONB meets the requirements
<p><b>B</b> The core area must provide sufficient area to meet the outreach and public access requirements, and strive to fully encompass the boundaries of publicly protected areas.</p>	<p>The core area has been selected to be large, recognising the good quality dark skies. This ensures that the larger part of publicly accessible land within the AONB is part of the core, providing opportunities for outreach and education, such as at the designated stargazing locations. The proposed outer IDSR boundary (i.e. outer boundary of the buffer) is coterminous with the AONB boundary).</p>
Summary of IDA eligibility requirement	How the AONB meets the requirements
<p><b>C</b> The peripheral area should encompass a minimum of 700 km<sup>2</sup>, or an area sufficient to mitigate 80% of current and expected future light pollution threats.</p>	<p>The proposed reserve (both core and buffer) includes the entire AONB protected landscape. This is a total of 983 km<sup>2</sup> (of which the core forms 655 km<sup>2</sup>).</p>
Summary of IDA eligibility requirement	How the AONB meets the requirements
<p><b>D</b> The core must provide the opportunity for regular public nighttime access.</p>	<p>Local astronomy groups and the AONB organise regular stargazing events. Local astronomers and visitors have access to the AONB for stargazing and telescope work. We have identified and publicised a list of the top ten stargazing locations in the AONB, which are all publicly accessible. Additionally, public roads and paths across the AONB provide full and unimpeded access to many locations. Separately to this application, a major Heritage Lottery-funded project has been approved for the AONB, which is a significant success for us. The programme, which covers part of the AONB, includes dark skies projects, which will help us in engaging with local residents to promote messages and get people actively involved, in events and as Dark Sky Champions.</p>
Summary of IDA eligibility requirement	How the AONB meets the requirements
<p><b>E</b> The core must provide an exceptional dark sky resource.</p>	<p>The light pollution satellite data produced by the Campaign to Protect Rural England. (the 'Night Blight' maps) shows that we have good quality dark skies, with 52% and 40% of the AONB falling into the darkest and next darkest categories. From our dark sky quality meter readings, we have calculated that 50.36% and 48.45% of the proposed IDSR achieve silver and bronze IDA status, respectively. The average zenith sky quality readings for the core and buffer are 21.01 and 20.92 mags arcsec<sup>2</sup>, respectively. The topography of the AONB contributes to the dark sky quality by impeding light pollution from outside its boundary.</p>



# Minimum requirements

	Summary of IDA minimum requirement	How the AONB meets the requirements
<b>A</b>	A quality comprehensive Lightscape Management Plan (LMP) should be adopted by a sufficient number of communities within the entire IDSR, corresponding to at least 80% of the population and 80% of the designated area of protection.	For this purpose, our partner local authorities, which between them cover the whole area of Cranborne Chase AONB, have been taken to represent communities in the proposed IDSR in the context of this requirement. By adopting the AONB's Management Plan, each has approved the commitment for the AONB to apply to be an IDSR within its own policies. Once formally adopted, the AONB Management Plan policies become the policies of the seven constituent authorities. The importance of dark night skies and the issues of light pollution have been referred to in our five-year Management Plans since 2004.  The AONB's Position Statements on Light Pollution and Good Practice Guidance on Good Lighting are regularly cited in responses to planning applications.
<b>B</b>	There should be evidence of community commitment to dark skies and lightscape management, as shown by at least 67% of existing outdoor lighting fixtures within the core conforming to the LMP.	The AONB has engaged with and promoted good lighting practices for at least ten years. We have actively advocated best practice in new developments and sought compliant lighting in all applicable planning applications, with increasingly good results. We also work with the local community to promote why reducing light pollution is important. Parish Councils and others in the local community have been very supportive of the initiative, and engaged in finding out more about dark sky friendly lighting, as well as including dark sky friendly policies in their own local plans. We appreciate that the proportion of existing outdoor light fittings in the proposed core that comply with the requirements is currently below 67%. However, initiatives are already in progress that will address this, including the Wiltshire street lighting upgrade. The number of lights in the AONB is overall fairly low, and residents tend to switch outside lights off at night, meaning the outcome is a good quality of dark night skies.
<b>C</b>	Completion of a Lighting Inventory and a plan to bring 90% of outdoor lighting into compliance with the Reserve's LMP within five years, and a written commitment to bring the Reserve into 100% compliance within ten years of designation.	A lighting inventory has been completed of sample villages selected from the main landscape character types of the AONB. The Inventory shows that our challenge mainly lies in improving compliance for domestic lighting, and we have set out our plans to do so in the Lightscape Management Plan and our future plans (Sections F and H, respectively). We are confident this can be achieved. The major street lighting upgrade approved by Wiltshire Council, which covers 62% of the AONB, will bring whole-AONB street lighting compliance to required levels. We are therefore committed to achieving 90% and 100% compliance in the core within five and ten years, respectively, of achieving full IDSR status, working with our partner local planning authorities.
<b>D</b>	A measurement programme must be maintained to follow the evolution of light pollution in the IDSR core and assert the night sky quality does not degrade.	Sky quality has been measured since 2014. Working with the local astronomers who have conducted our dark sky readings, and by engaging volunteers following designation, we plan to measure one third of the total area of the IDSR (core and periphery) each year. This will ensure each sampling grid square is surveyed a minimum of once every three years.



	Summary of IDA minimum requirement	How the AONB meets the requirements
<b>E</b>	Communities must have a number of examples of conforming lighting installations... either at least one highly visible demonstration project and/or 10% of fixtures outside the core must be retrofitted or brought into compliance.	Street lighting within the AONB boundary is subject to night dimming and/or switch-off. Wiltshire Council has finalised a programme (budget agreed by the authority in December 2018) to replace its street lighting assets. This will include the provision of fully compliant fittings within the Wiltshire section of the AONB in 2021, and will meet the requirements for 10% of fixtures outside the core becoming compliant, and for achieving 67% compliance (for street lighting) within the core. Wiltshire street lighting assets outside the AONB boundary will also be compliant, thus positively impacting on reducing sky glow visible from the AONB: some of this will be achieved in the early part of the programme. Dorset Council has for a number of years implemented actions that positively benefit dark night skies. Wiltshire Council and Dorset County Council cover 62% and 29% of the AONB, respectively. In addition, a housing development (171 dwellings) within the buffer area (near Shaftesbury) has now been given planning approval by Dorset Council; this development incorporates an IDA-compliant lighting scheme.
	Summary of IDA minimum requirement	How the AONB meets the requirements
<b>F</b>	Participating communities must have a programme, either through education, economic incentives, permitting or regulation, to encourage all new outdoor lighting fittings to conform to the relevant regulation or guidelines for night sky friendly lighting.	The AONB is not a planning authority, so works with the local planning authorities that cover its area to promote permitting and regulation programmes. The AONB has issued its own position statements and guidance on light pollution since 2004, which it regularly cites in responses to planning applications or to developers. The AONB's Management Plan is formally adopted by our local authority partners, and contains their policies for managing the AONB. As such, its inclusion of criteria relating to light pollution becomes the local authority policy for the AONB.  We have engaged with Parish and Town Councils to provide information about good practice for outdoor light fittings, and have received support from them. We are beginning work with farmers through our 'farming clusters'. The clusters have been in place for several years, and are therefore well-established. Discussions with them on lighting are in the early stages, and will be pursued next year in more depth. We plan to instigate a 'dark sky friendly' scheme, tailored for specific audiences, such as farmers, tourism, and parishes/villages in order to encourage them to meet dark sky friendly criteria in external lighting. We will make available a funding contribution to farmers wishing to upgrade their lighting. In March 2019, we ran targeted workshops for local tourism businesses on operating as a dark-sky-friendly business.
	Summary of IDA minimum requirement	How the AONB meets the requirements
<b>G</b>	The Reserve must have a commitment to public education.	The AONB has been promoting the importance of dark night skies for some 15 years. We regularly run stargazing evenings, in partnership with Wessex Astronomical Society, and recently ran our very first weekend-long Star Fest, with stargazing and a daytime mobile planetarium and sun scope, virtual reality workshops, and star-themed storytelling sessions, as well as other attractions. School workshops were commissioned from Space Detectives, and we have partnered with Bob Mizon and others to provide school assembly and classroom talks. Other promotion occurs through the Chasing Stars website and other material, including planning statements, seminars, and good practice guidance.
	Summary of IDA minimum requirement	How the AONB meets the requirements
<b>H</b>	There must be acknowledgement of the protected area by government or regulatory agencies higher than community level.	Letters of support from partner authorities and government sources have been received, as well as from other groups and individuals, such as local astronomy groups, parish councils, and local Members of Parliament.



	Summary of IDA minimum requirement	How the AONB meets the requirements
I	Erection of signage.	If our application is successful, we would support and encourage local communities who wished to erect signage in order to highlight the status of the AONB as an IDSR, and the support of the community. This would be linked to our dark-sky-friendly scheme. Local signage would be designed to meet any planning requirements.
	Summary of IDA minimum requirement	How the AONB meets the requirements
J	Once established, the IDSR must erect and maintain a sign indicating the IDA Dark Sky Reserve designation at an appropriate location (roadway, footpath or visitor contact centre).	As above, we would erect an appropriate sign(s) if successful in our application, meeting any local planning requirements. Sites for signs would include the AONB's own Headquarters, and the planned Observatory.
	Summary of IDA minimum requirement	How the AONB meets the requirements
K	There will be regular review by the IDA that minimum requirements continue to be met.	We will incorporate regular monitoring against sky quality measurements and progress on planning considerations, as well as other indicators. Through the Annual Report, we will provide information to the IDA on our progress towards achieving future targets. The monitoring programme, including frequency, is set out in Section H.
	Summary of IDA minimum requirement	How the AONB meets the requirements
L	The Reserve will submit an Annual Report to the IDA by 1 October of each year.	We commit to completing an Annual Report each year.
	Summary of IDA minimum requirement	How the AONB meets the requirements
M	Sky quality tiers for Core determination.	Section C sets out the detail of our sky quality mapping and planning. 50.4% and 48.5% of the core fall within the Silver and Bronze categories, respectively. We therefore propose (Section D) a Bronze status core. The mean zenith sky quality in the core and buffer is 21.01 and 20.92 mag per arcsec <sup>2</sup> , respectively.

The section summaries at the top of each of the following Sections indicate to which of the Eligibility (E) and Minimum (M) the Section is relevant.



# SECTION A CRANBORNE CHASE AONB: A NATIONALLY PROTECTED LANDSCAPE



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## SECTION A

# CRANBORNE CHASE AONB: A NATIONALLY PROTECTED LANDSCAPE

### SECTION SUMMARY

- Cranborne Chase AONB is a nationally designated protected landscape in the UK.
- The AONB straddles four County-level local authorities, and is 983 km<sup>2</sup> in size (380 square miles).
- The population is just over 33,000. Most settlements are rural, with Tisbury the largest (population 2000).
- A little under 90% of the AONB is privately owned.
- The geology and landscape of the AONB is highly varied, divided into eight overall landscape types, each with its own character and special sense of place. It is also a living landscape, with a rich ecological diversity of habitats and wildlife.
- A study in 2008 identified the levels of tranquillity in different parts of the AONB. ‘Seeing the stars at night’ was one of the factors examined.
- Cranborne Chase has a rich natural, cultural and archaeological history – from prehistoric settlements to the hunting forests of the kings and queens of England, to the thatched and traditional village buildings that remain today.
- The AONB is 75% funded by the Government’s Department of the Environment, Fisheries and Rural Affairs (Defra) and 25% by the constituent local authorities.

**Relevant to IDA criteria:** E(A), E(D)

**Related appendices:** A.1 Statutory designation of Areas of Outstanding Natural Beauty; A.2 What makes Cranborne Chase AONB special? A.3 The eight landscape character types of Cranborne Chase AONB.

***“I have been to festivals and events in the AONB and been entranced by the night skies that can be seen there. This is something all too rarely seen in a small country such as ours, is very precious and should be preserved. It is fitting that the night sky can be seen in such glory in a place with such a rich archaeological history.”***

Feedback from Dark Sky Pledge responses.



▲ **Fig. A1:** Knowlton Church (© Paul Howell / Pictor Images). This ruined church lies at the heart of the largest concentration of prehistoric barrows and henges in the UK. It is one of our top ten stargazing locations. Standing there at night, it is easy to imagine you are back in prehistory, telling stories of the stars and constellations.



# What is an Area of Outstanding Natural Beauty?

**An AONB is one of the UK's finest landscapes.** Its distinctive character and natural beauty are so precious that it is in the nation's interest to safeguard them. AONBs are equivalent in protected landscape status to National Parks (the existing IDSRs in the UK – Exmoor, Snowdonia, Brecon Beacons, and South Downs – are all National Parks).

An AONB's primary purpose is to 'conserve and enhance the natural beauty of the landscape, including wildlife, scientific and cultural heritage' (see Appendix A.1). There are two secondary objectives, set by the Countryside Commission in 1991<sup>1</sup>:

- To take account of the needs of agriculture, forestry and other rural industries and of the economic and social needs of local communities.
- To meet the demand for recreation as far as this is consistent with the conservation and enhancement of natural beauty and the needs of agriculture, forestry and other uses.

**The European Landscape Convention** – a Treaty of the Council of Europe – came into force in the UK on 1 March 2007, and is important in considering natural beauty and its management. It acknowledges:

*... that the landscape is an important part of the quality of life for people everywhere: in urban areas and the countryside...*

The Convention importantly defines landscape in relation to people:

*... an area, as perceived by people, whose character is the result of the action and interaction of natural and / or human factors.*

The aims of the Convention are:

*... to promote landscape protection, management and planning, and to organise European cooperation on landscape issues.*

It is of particular significance that all landscapes are recognised in this Convention, and not just those that already have wildlife or natural beauty designation. In this context, **natural beauty** is not just the look of the landscape<sup>2</sup>. It covers landform, geology, plants and animals, landscape features and the rich history

<sup>1</sup> Countryside Commission Policy Statement on Areas of Outstanding Natural Beauty 1991

<sup>2</sup> The Natural Environment and Rural Communities Act 2006 clarified that land is not prevented from being treated as of natural beauty because it is used for agriculture, or woodlands, or as a park or that its physiographical features are partly the product of human intervention in the landscape.



▲ **Fig. A2:** Looking towards Sutton Veny (© Tony Braime). This small village, another of our top ten stargazing locations, sits in the Wylde Chalk River Valley in the north of the AONB.



of human settlement and interactions with nature over many centuries. This is important – an AONB is a working as well as beautiful landscape, supporting the livelihoods as well as the recreation and wellbeing of the people that live and work within it.

**Cranborne Chase AONB<sup>3</sup>** is a cultural, living landscape by virtue of both the species and habitats within it and its special qualities, maintained by human activity over centuries (see Appendix A.2). The expansive, open downlands, the many historic and literary associations, high levels of tranquillity, and the vast dark night skies comprise important elements of the AONB’s natural beauty. Those who manage the land are central to the future of this cultural landscape, which will inevitably continue to evolve. This evolution, however, needs to be in ways that conserve and enhance its special qualities. The dark night skies of Cranborne Chase above our heads are as much a part of this aspiration as the ground under our feet.



▲ **Fig. A3:** A panorama of Sutton Veny in the north of the AONB, one of our top ten stargazing sites, by night (© Paul Howell / Pictor Images).

<sup>3</sup> The full legal name of the AONB is the Cranborne Chase and West Wiltshire Downs AONB. It has been agreed by the Partnership Board that it will be known day-to-day as Cranborne Chase AONB.

***“Dark night skies are crucial for protected landscapes and tranquillity.”***

Feedback from Dark Sky Pledge responses.

## What makes Cranborne Chase AONB special?

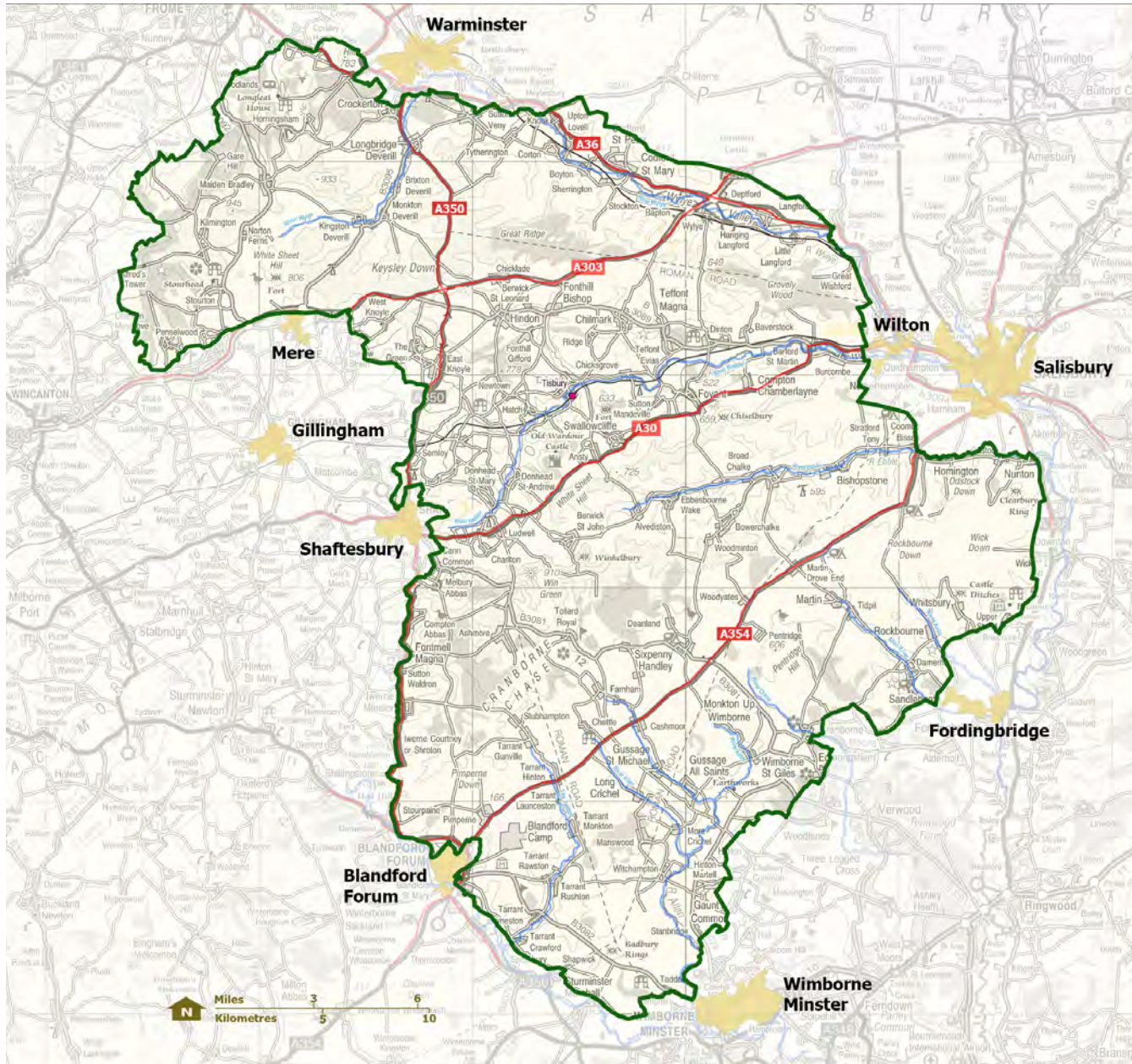
The landscape, wildlife and biodiversity of the AONB are rich and varied. Also intrinsic to its character is the way the land has been used over the centuries – its history and culture. Special characteristics of the AONB's environment include:

- **A peaceful, tranquil, deeply rural area**, largely unspoilt and maintained as a living agricultural landscape.
- **A bountiful mosaic of habitats**, including the distinctive species-rich chalk downland and streams, playing host to a myriad of wildlife, including rare and emblematic species.
- **Strong sense of remoteness.**
- **Expanse of dark night skies** and ability to see the Milky Way.
- An unusually high proportion of **ancient woodland in a chalk landscape**, largely due to its historical status as a royal hunting area.
- Arable fields supporting **rare arable plants** and a number of **declining bird species**.
- **A landscape etched with the imprint of the past** - visible archaeological features including prehistoric earthworks, settlements, field systems, water meadows and former settlements.
- **The former mediaeval hunting areas** of Selwood Forest, Grovely Forest, and the Cranborne Chase.
- **A rich land use history**, with areas that have a concentration of ancient enclosure, ancient woodland, and former common land.
- **A concentration of historic parklands, estates, and manor houses** together with Historic Parks and Gardens of national and county importance.
- **Literary, artistic and historic connections** of national and international distinction.



▲ **Fig. A4:** Contemplating the view of Old Wardour Castle (© Richard Burden). Built in the 14th century, the castle was razed in the English Civil War in the mid-17th century. The castle ruins and grounds are a popular attraction.





◀ **Fig. A5:** Map of Cranborne Chase AONB showing its boundary, the major road routes through it, and the urban conurbations in locations just outside its boundary.

The outline map below indicates the AONB's geographical location within the UK.



## The landscape of Cranborne Chase AONB

The landscape of the AONB is diverse, comprising eight different landscape character types (Fig. A7; Appendix A.3). This is highly relevant to our bid to be an IDSR. For example, the chalk escarpments are less accessible with only scattered settlements, contributing little light pollution. They are also a natural barrier to light infiltration from surrounding urban areas. In contrast, the chalk river valleys host several villages, but these are generally nestled within the valley, thus again mitigating the limited light emissions they produce. This is why, in our external lighting audit (Section E), we sampled at least one example village from each landscape character type, to test for differences. We have also analysed night sky quality readings by landscape character type (Section C).

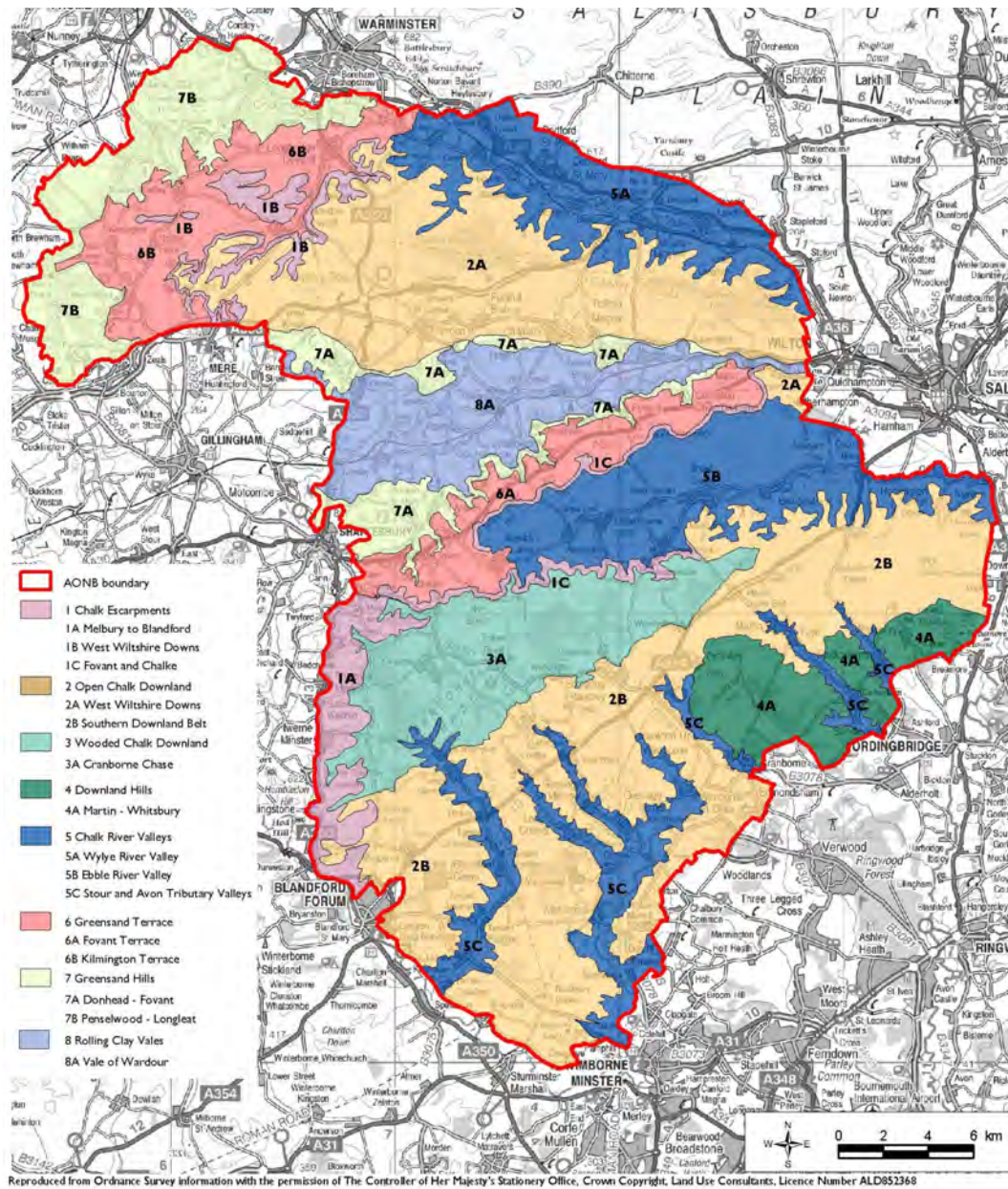


▲ **Fig. A6:** A Cranborne Chase landscape of open chalk downland, with a chalk escarpment rising beyond. The relatively unsettled escarpments enjoy dark night skies, and provide a natural barrier to light pollution from urban areas outside the AONB boundary.

***"Cranborne Chase is a lovely place to walk and just see everything."***

Feedback from Dark Sky Pledge responses.





◀ **Fig. A7:** Map of Cranborne Chase AONB showing the geographical extent of the landscape character types and areas. The landscape character types are summarised below, with a fuller description in Appendix A.3.

**Chalk Escarpments:** The most dramatic elements of the chalk landscape, hosting important nature conservation sites and ancient field systems.

**Open Chalk Downland:** Gently rolling spurs and dry valleys, conveying a sense of a panoramic landscape, with open views of the skies. Neolithic, Bronze Age, and Romano-British historical features are found.

**Wooded Chalk Downland:** Similar to Open Chalk Downland but, as the name suggests, supports a more wooded landscape.

**Downland Hills:** Dominated by chalk and arable landcover and characterised by prominent knolls and hills.

**Chalk River Valleys:** The river valleys drain the chalk downs. In contrast to the less settled downland, villages tend to be concentrated in the valleys.

**Greensand Terrace:** Level terraces of rich brown earth, supporting arable crop production.

**Greensand Hills:** These mark the transition between the clay lowlands and elevated chalk.

**Rolling Clay Vales:** The Vale of Wardour is distinct from the chalk landscapes elsewhere in the AONB, defined by a mix of pastures and arable crops, and a settled landscape of farms, hamlets and villages in the folds of the valley bottoms.



## The wildlife and habitats of the AONB

Cranborne Chase is a living landscape. Its rich ecological character is expressed in the diversity of habitats, including the distinctive species-rich chalk downland, clear fast flowing chalk streams and rivers, ancient and calcareous woodlands, and rare chalk heath and water meadows. The AONB's characteristics and qualities make it special, as a whole, with regards to the natural environment:

- An abundance of both emblematic wildlife species and those suffering decline, such as the Greater horseshoe bat, Adonis blue and Duke of Burgundy butterflies, Tree sparrow and Skylark.
- Clear streams and rivers supporting wild Trout, Grayling, Dace and Chub, together with the fast disappearing Water vole and aquatic species that rely on high quality water such as the White-clawed crayfish, seriously threatened by the introduction of non-native Crayfish.
- Extensive tracts of arable land supporting the six most nationally threatened farmland birds: the Grey partridge, Lapwing, Turtle dove, Yellow wagtail, Tree sparrow and Corn bunting. Rare arable plants, such as the Prickly poppy and Pheasant's-eye, are also found in this habitat.
- Cranborne Chase is particularly notable for its unusually high proportion of ancient woodland within a chalk landscape. This is largely due to its historic status as a royal hunting area.

This special landscape is further enhanced by historic human impacts on the environment, such as the presence of old buildings (barns and roof spaces, for example) and ponds, which provide refuge and foraging opportunities for creatures such as bats, birds and insects.

The dark night skies of the AONB therefore provide a refuge for all different kinds of nocturnal wildlife. However, pressures on development and housing outside our boundary make it increasingly important to ensure we can continue to protect the tranquillity of our night-time environment.

Across the country, wildlife has evolved to adapt to the alternating cycles of day and night, dawn and dusk. Artificial light at night disrupts circadian rhythms, reducing animal fitness and plant health. Light pollution has the ability to affect entire ecosystems, from top predators to primary producers. Below is listed just a small handful of examples of species and habitats found in the AONB that we need to protect from artificial light at night, and why.

### **Bats and insects: artificial light and ecosystem-wide disruptions**

All the UK's bats are protected and some, such as the **Greater horseshoe bat** (*Rhinolophus ferrumequinum*), are in decline, with populations becoming fragmented. This species, one of the UK's rarest mammals, is restricted to south-west England and south Wales and is found in locations such as

Chilmark Quarries in the AONB. It prefers to forage in very low light/complete darkness – as a relatively slow-flying bat species, it is less able to evade predators speedily compared with its faster-flying cousins. It may therefore abandon lit feeding areas, which make it feel vulnerable, thus losing out to other, less light-sensitive, bat species.

Further down the food chain, many nocturnal insects, including several **moth** species, are attracted to artificial light sources. This makes their populations more vulnerable to predation than if they were more widely distributed across the landscape. This in turn has an impact higher up the food chain, as the foraging ability of slow-flying bat species (such as the Greater horseshoe) is affected by insect prey becoming more concentrated towards artificial light sources. Artificial light can therefore disrupt the sensitive balance of the food chain, resulting in lowering of fitness and survival.

Artificial light can also reduce reproductive success. Another insect, the **Firefly** (or glow-worm, *Lampyrus noctiluca*), is found at a small number of locations in the AONB, especially along the western side of some of the chalk escarpments. Research suggests these beautiful insects are affected by artificial light dimming the effect of the light used by the females to attract mates. Additionally, like moths, males are sometimes attracted by the light from artificial light fittings, thus also reducing breeding success and making them more vulnerable to predation.





### ***Below the surface: freshwater fish and artificial light***

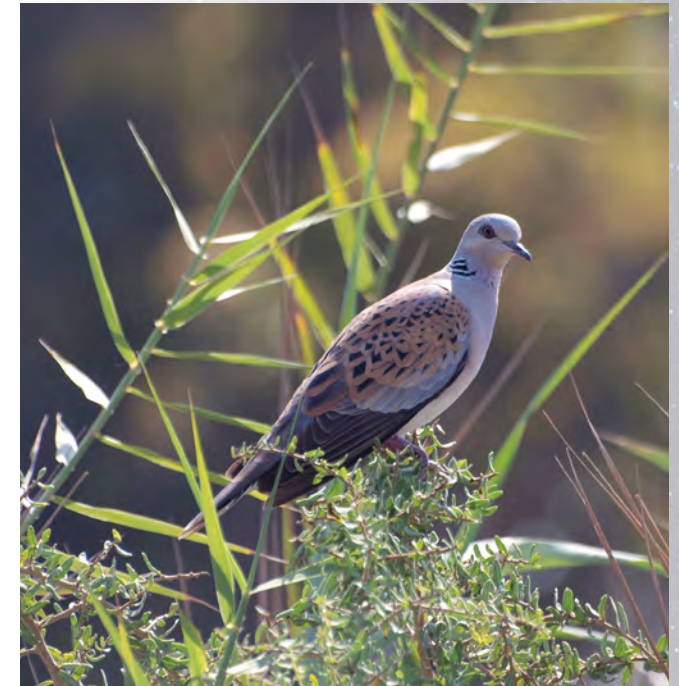
Research suggests that artificial light affects fish species, by causing spatial or temporal disorientation, altering migratory behaviour, or attracting predators. The chalk streams of the AONB host several freshwater fish species, including the **Chub** (*Leuciscus cephalus*). In a laboratory experiment (Brüning, A., Hölker, F. & Wolter, C. Aquatic Science (2011) 73: 143), under a continuous light regime Chub showed an acceleration of hatching and swim bladder inflation.

### ***Broken flyways: nocturnally migrating birds and light pollution***

Migratory bird species face threats from artificial light during their migratory journeys. Many migrate to the UK in summer from African wintering grounds, and must cross belts of light-polluted land, as well as negotiating lit oil platforms; these hazards cause visual disorientation, and hinder the effectiveness of their magnetic compass (which is calibrated by light). The **Turtle dove** (*Streptopelia turtur*) is Europe's only long distance migratory dove, travelling from sub-Saharan West Africa. In the UK, it is now threatened by habitat loss, and is indeed close to extinction here – numbers have dropped by a staggering 95% in the last 20 years. The gentle purring of its call, remembered fondly by older generations, is now only rarely heard. Martin Down National Nature Reserve in the AONB is an important site in southern Britain for this summer visitor. Tracked individuals have been shown to migrate to and from their African wintering grounds under cover of darkness. They face many perils on the journey, and we want to make sure this shy bird lands in a tranquil environment, unaffected by light pollution.

### ***Into the woods: preserving our ancient woodlands***

**Ancient woodlands** in the UK, relics of the forest that once covered the land, form a special habitat, rich in biodiversity. Ancient woodland is generally taken as woodland that is at least 500 years old, often with evidence of historical management practices, such as coppicing or charcoal burning. This continuity means they are favoured by species, including specialist flora and fauna, requiring habitat and microhabitat stability. Their soils are also rich and biodiverse. There are a little over 550,000 ha of ancient woodland in the UK, which is 2.3% of the land area. Cranborne Chase has 7000 ha, which is 7% of its area. This habitat is therefore a hugely valuable part of the AONB's history and ecology. Some research shows that trees have their own circadian rhythms, and that exposure to constant artificial light causes them to function less effectively and shortens their lifespan. It is therefore clearly important to continue to protect our historically important ancient woods from light pollution. The trees they contain, such as ancient oaks, which are ecosystems in themselves, hosting hundreds of species from insects to lichens to fungi, require



**Fig. A8:** Turtle dove (*Streptopelia turtur*). Revital Salomon [CC BY-SA 4.0 (<https://creativecommons.org/licenses/by-sa/4.0/>)]

our protection from artificial light as much as from other forms of pollution and disturbance.

### ***Conclusions***

These are just a few examples of why we need to protect the AONB's wildlife and habitats from light pollution. With low levels of artificial light and a relatively low density of human settlements, we provide accessible habitats for a wide range of flora and fauna. Achieving IDSR status would enable us to ensure the dark night skies of the AONB continue to provide a safe home for our wildlife.



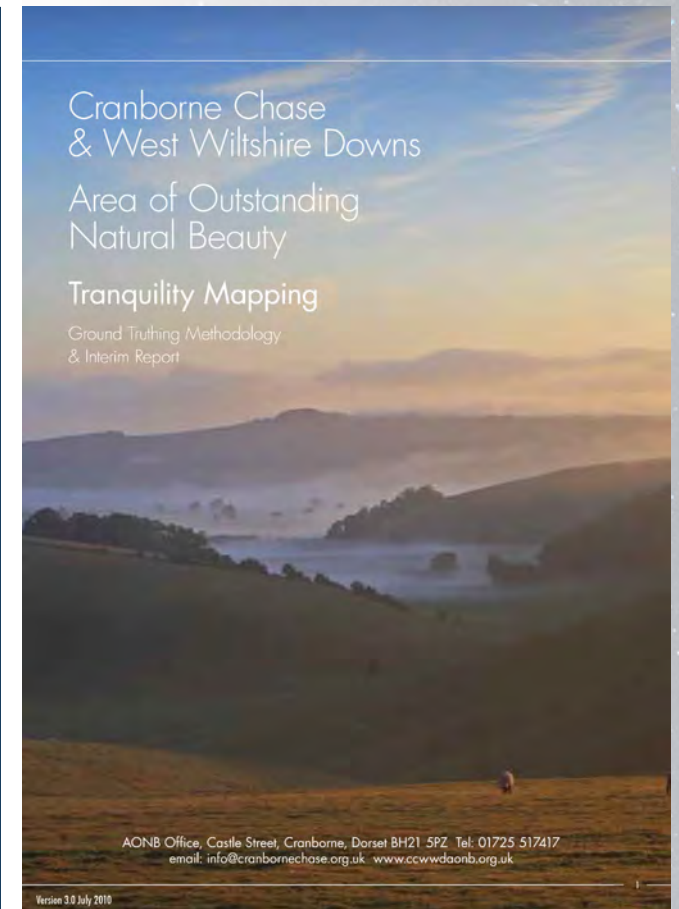
## Tranquillity in the AONB and dark night skies

The Campaign to Protect Rural England (CPRE) published a Tranquillity Map of England in 2006, based on research by Northumbria and Newcastle Universities. The map used surveys of the human experience of tranquillity – and the factors that add to or detract from it – with desk-based analysis of national data on the presence of such factors in the landscape.

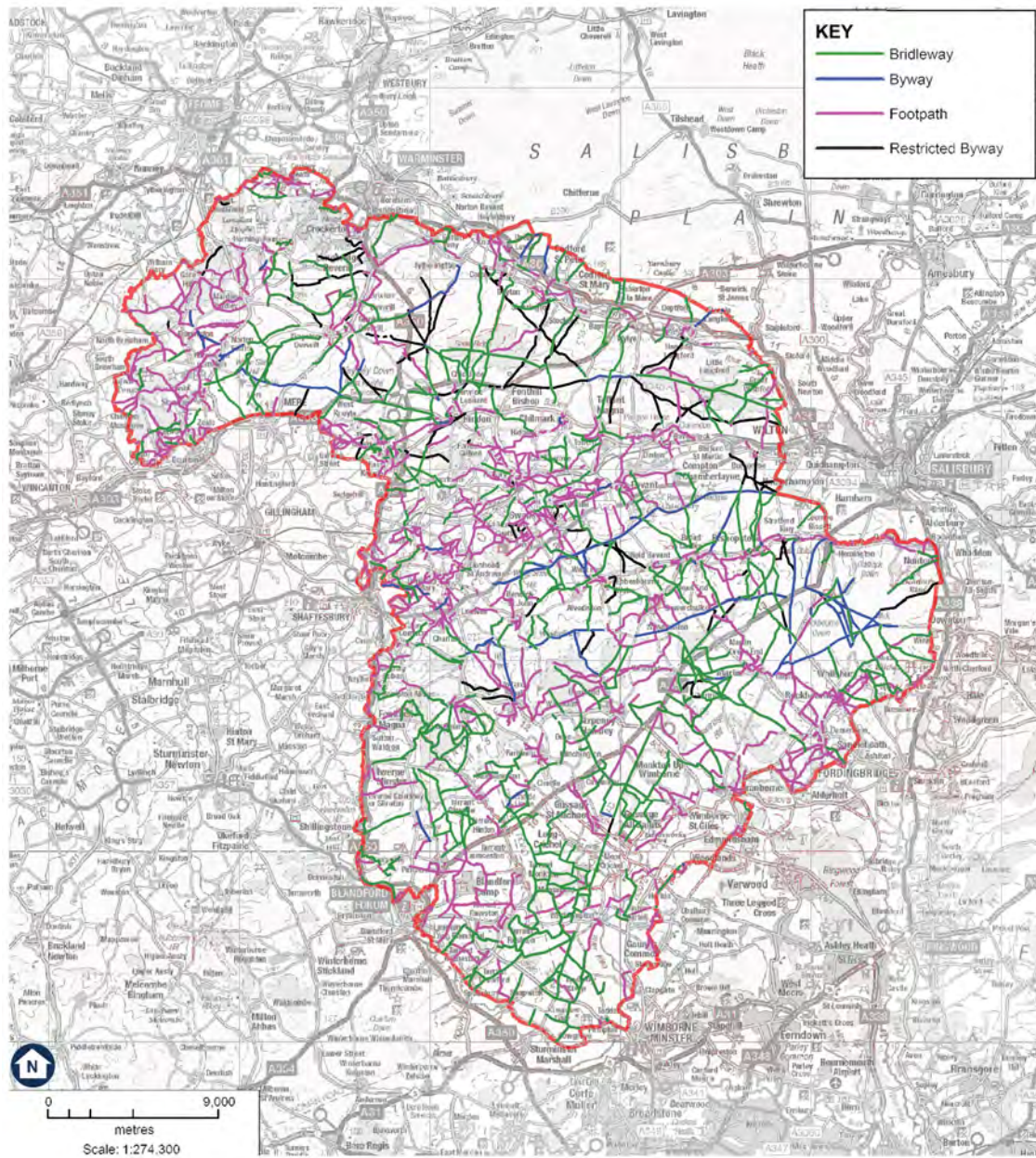
In February 2008, the AONB completed a report Tranquillity Mapping – Investigative Study (Fig. A9). This was an initial investigation into tranquillity data supplied to the AONB from the original research, recalculated from national data, and cut to the AONB boundary. The purpose was to better understand which were the most and least tranquil areas of the AONB, and why. Innovatively, the AONB decided to undertake a ground truthing exercise, supplementing the original desk data with field studies. The methodology for the AONB's ground truthing focussed on selected 500 m x 500 m squares, which were surveyed during the day to assess how they performed for each of the tranquillity factors. The subsequent analysis plotted the results by landscape character type.

The original CPRE report divided the tranquillity factors into 'what you can see' and 'what you can hear'. Being able to see the stars at night was in the top ten positive survey responses, and overhead light pollution was in the top ten negative responses.

The sky quality data collected recently can be used to add depth to our understanding of the tranquillity of the AONB. We discuss this in in Section C (The Dark Night Skies of Cranborne Chase).

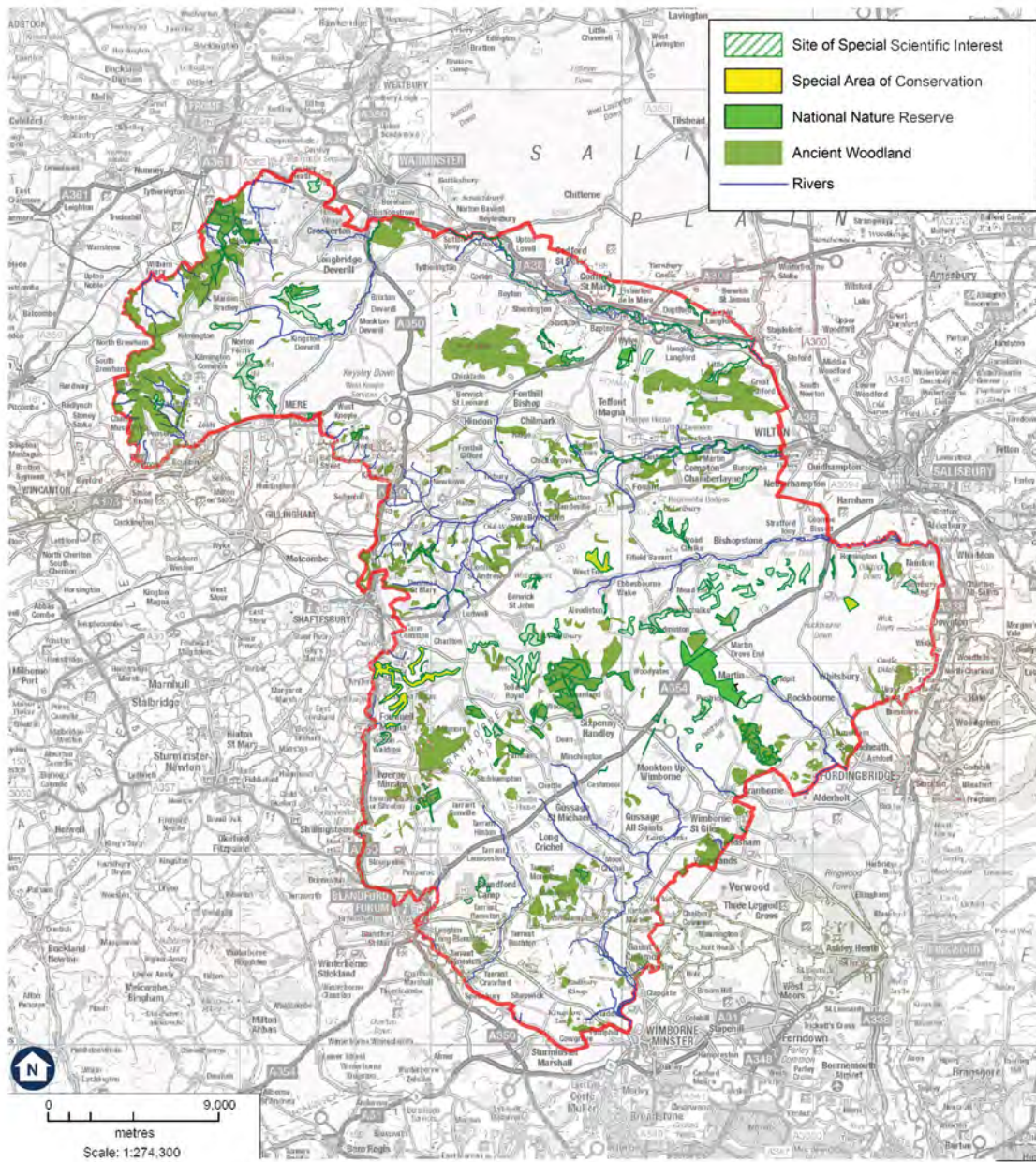


▲ Fig. A9: Tranquillity mapping report



◀ **Fig. A10:** Accessibility of the AONB via footpaths, byways and bridleways.





◀ **Fig. A11:** Within the AONB are other designated areas, as indicated in the key. The designations are described in Appendix A.1.



# Accessing our night-time landscape

About 96% of the AONB is farmland (86%) or forestry (10%), the majority of which is privately owned. However, most of the forestry (c. 10%) is state-owned (Forestry Commission) and therefore fully accessible. Moreover, the AONB landscapes, including otherwise private land, are crossed by a myriad of publicly accessible trails – bridleways and footpaths – many of which follow ancient tracks and drove roads (Fig. A10), to which the public have a legal right of access. End-to-end they measure some 1500 km. Other areas within the AONB are designated primarily for conservation, such as national nature reserves (Fig. A11; Appendix A.2 explains more), which are accessible to the public. While care always needs to be taken at night, these routes and locations can be visited for stargazing, just as they are open during the day.

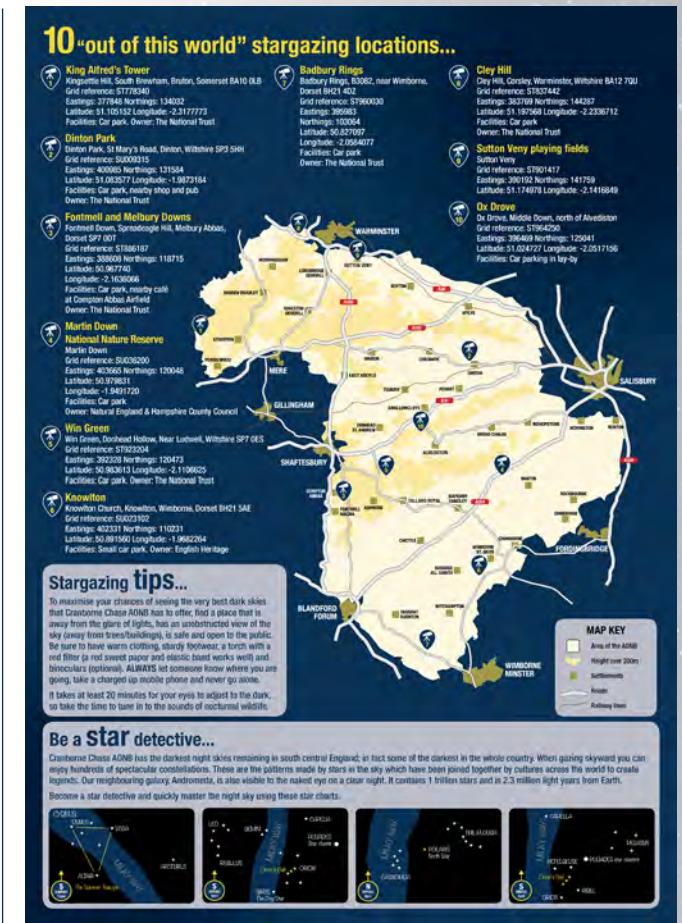
We often start conversations with people about dark night skies by reminding them that 50% of the AONB's landscape is above our heads. Yet, this skyscape is not legally protected in the same way as the downlands and fields beneath our feet. It is therefore very important to engage with people about why it is so vital to protect the night sky from light pollution. It is inspiring how many local communities understand its value. Our outreach work with residents and others, and the way in which their enthusiasm inspires us in turn, are covered in Section G.

However, strongly linked to the general accessibility of the AONB's protected landscape to visitors, is its accessibility for astronomy events. On our dedicated Chasing Stars website (<http://www.chasingstars.org.uk>) we have included information and advice on how to safely go stargazing, including equipment and health and safety.

More specifically, we have identified and agreed access with the landowners to ten good stargazing locations across the AONB. This promotes the value of the AONB for astronomy, and provides sites to visit with binoculars and telescopes by night for all to enjoy. Annex G.2 describes all ten sites.

***“We had a fantastic evening at the Ansty Farm Shop star-gazing event - thank you.”***

Feedback from Dark Sky Pledge responses.



▲ Fig. A12: The AONB's top ten stargazing locations. The image is an extract from our information leaflet Chasing Stars in our Outstanding Night Skies.

## An award - recognising our progress

This section has described the beauty of Cranborne Chase, and given a flavour of our commitment to dark night skies, and why we consider they are as much a part of our landscape as its 'daytime' scenery. Cranborne Chase AONB has been committed to protecting our dark skies, and promoting the benefits they bring, for more than ten years.

In full recognition of this, the AONB Director, Linda Nunn, was presented in 2017 with the Joy Griffiths Award by the British Astronomical Association's Commission for Dark Skies (CfDS). This award is made 'for meritorious efforts in the cause of darker night skies for our descendants'.

Bob Mizon, co-ordinator at the CfDS, who presented Linda with the award, said:

*"Cranborne Chase AONB is an example of an organisation that has made its dark night skies a priority. It is heartening to see that it constantly has stars on its mind. Cranborne Chase AONB is accessible to large numbers of people, while Ansty, which is located within the central belt of the AONB, is the darkest recorded area within south central England. Anyone going to see the stars in the Cranborne Chase AONB definitely won't be disappointed."*

Our commitment to our starry skies has not waned. Harnessing the enthusiasm of local communities, astronomers and visitors, we have included a full set of objectives in our latest Management Plan. We have taken these a stage further by setting out in this application (Section H) a set of detailed objectives and indicators that we will pursue in order to ensure our starry skies are preserved for this and future generations to visit and enjoy.

**"Dark night skies are so important for us and wildlife."**

Feedback from Dark Sky Pledge responses.



▲ **Fig. A13:** Linda Nunn receiving the Joy Griffiths Award from Bob Mizon (right), Co-ordinator, Commission for Dark Skies (CfDS), and Howard Lawrence (left), committee member of the CfDS.

# SECTION B

# THE AONB AND

# THE PLANNING

# SYSTEM:

# AN OVERVIEW



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# SECTION B

## THE AONB AND THE PLANNING SYSTEM: AN OVERVIEW

### SECTION SUMMARY

- Policies and permissions relating to construction and land use change are delegated in law to local planning authorities (LPAs)<sup>4</sup>. AONBs are not LPAs.
- Cranborne Chase AONB was covered by nine local planning authorities (LPAs) until 31st March 2019, and seven from 1st April 2019.
- The local planning authorities are responsible for formally adopting the AONB's five-year management plan. The policies within the statutory AONB Management Plan become the adopted policies of the constituent local authorities.
- The AONB's Management Plans 2014–2019 and 2019–2024 include a commitment to apply to be an IDSR.
- The AONB works closely with LPA planning policy and development management teams to promote dark-sky friendly lighting.

**Relevant to IDA criteria: E(A), M(H)**

**Related appendices:** B.1 Planning in the AONB: the statutory planning process and dark night skies

*“Since moving to the area from a light-polluted city a few years ago I’ve come to love its [Cranborne Chase AONB’s] dark night skies, and want to see them conserved and indeed enhanced!”*

Feedback from Dark Sky Pledge responses.

<sup>4</sup> A local planning authority is defined in the UK as ‘the public authority whose duty it is to carry out specific planning functions for a particular area.’





This short section is included because of the importance of understanding the planning system within which AONBs work. Appendix B.1 (Planning in the AONB) sets this out in more detail. This is the framework within which we act to promote dark-sky friendly planning policies and decisions. The salient points are:

- AONBs are not local planning authorities (LPAs). Policies and permissions relating to construction and land use changes are, subject to national guidance, delegated in law to the LPAs that are the funding partners of the Cranborne Chase AONB's Partnership. The AONB is a consultee on planning policies and applications within its boundary, or which will impact it (e.g. large developments just outside the boundary), therefore influencing the individual LPAs, and works closely with its LPAs on policy formulation and decision making.
- This position contrasts with that for National Parks (such as Exmoor, Snowdonia, Brecon Beacons or South Downs), which are planning authorities and therefore can make planning decisions directly. AONBs and National Parks have equivalent protected landscape status.
- We have worked with the LPAs to influence and promote dark-sky friendly policies. This has been, and continues to be a productive engagement, to which the LPAs have responded positively (see Section F).
- Until 31st March 2019, there were nine LPAs covering the AONB (Table B1). Three of these have now merged into one, with Dorset becoming a Unitary Authority on 1st April 2019 (see Table B1 and its footnotes for an explanation of what this means in practice), so there are now seven LPAs.
- Our intention to apply to become an International Dark Sky Reserve was first explicitly stated in the 2014–2019 Management Plan, following a Light Pollution Study commissioned in 2007 (see Section C), and the publication of the AONB's Position Statement on Light Pollution in 2008. The AONB decided to defer the application in order to take the opportunity to redouble our engagement with the local community through education and events.

Section F (the Lightscape Management Plan) describes in more detail the development of our relationship with the LPAs in respect of dark sky planning considerations. It also sets out some specific projects and analysis that we feel contribute to the promotion of dark-sky-friendly planning in the AONB. As would be expected from the respective coverage of the different LPAs, a higher proportion of planning applications derive from Wiltshire and Dorset.

Unitary Authorities <sup>5</sup>	
<b>WILTSHIRE</b>	<b>DORSET<sup>6</sup></b> (was Dorset County Council <sup>7</sup> until 1st April 2019)
County Councils	District Councils
<b>HAMPSHIRE</b>	<b>NEW FOREST</b>
<b>SOMERSET</b>	<b>MENDIP</b>
	<b>SOUTH SOMERSET</b>

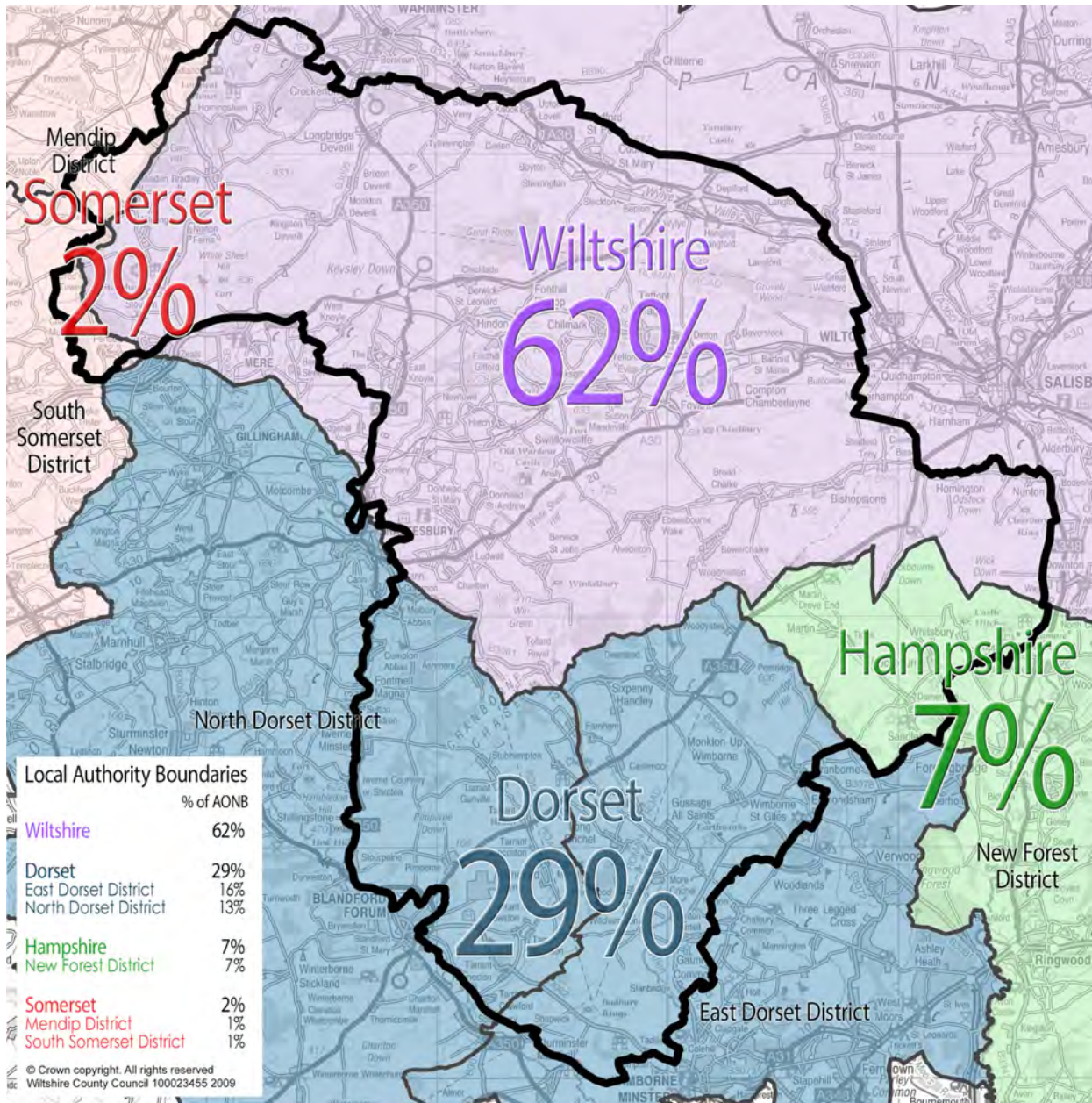
▲ **Table B1:** The seven local planning authorities.

<sup>5</sup> Many parts of England have two tiers of local government: county councils, and district, borough or city councils. In other parts of the country, there is just a single unitary tier of local government which provides all local services. County councils are responsible for education, transport, planning, fire and public safety, social care, libraries, waste management, and trading standards. District councils are responsible for refuse collection, recycling, council tax collections, housing, and planning. Unitary authorities are responsible for all of these functions.

<sup>6</sup> Dorset Council became a unitary authority on 1 April 2019, taking on the functions previously undertaken by East Dorset District Council and North Dorset District Council.

<sup>7</sup> Prior to 1st April 2019, there were two other District Councils – East Dorset and North Dorset – which were relevant to the AONB.





◀ **Fig. B1:** AONB map showing the proportion of its area covered by each of the four county-level planning authorities. The inset also shows the percentage coverage by each of the District Councils (the functions of East and North Dorset are now performed by Dorset Council unitary authority).



# SECTION C

# THE DARK NIGHT SKIES

# OF CRANBORNE

# CHASE AONB



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## SECTION C

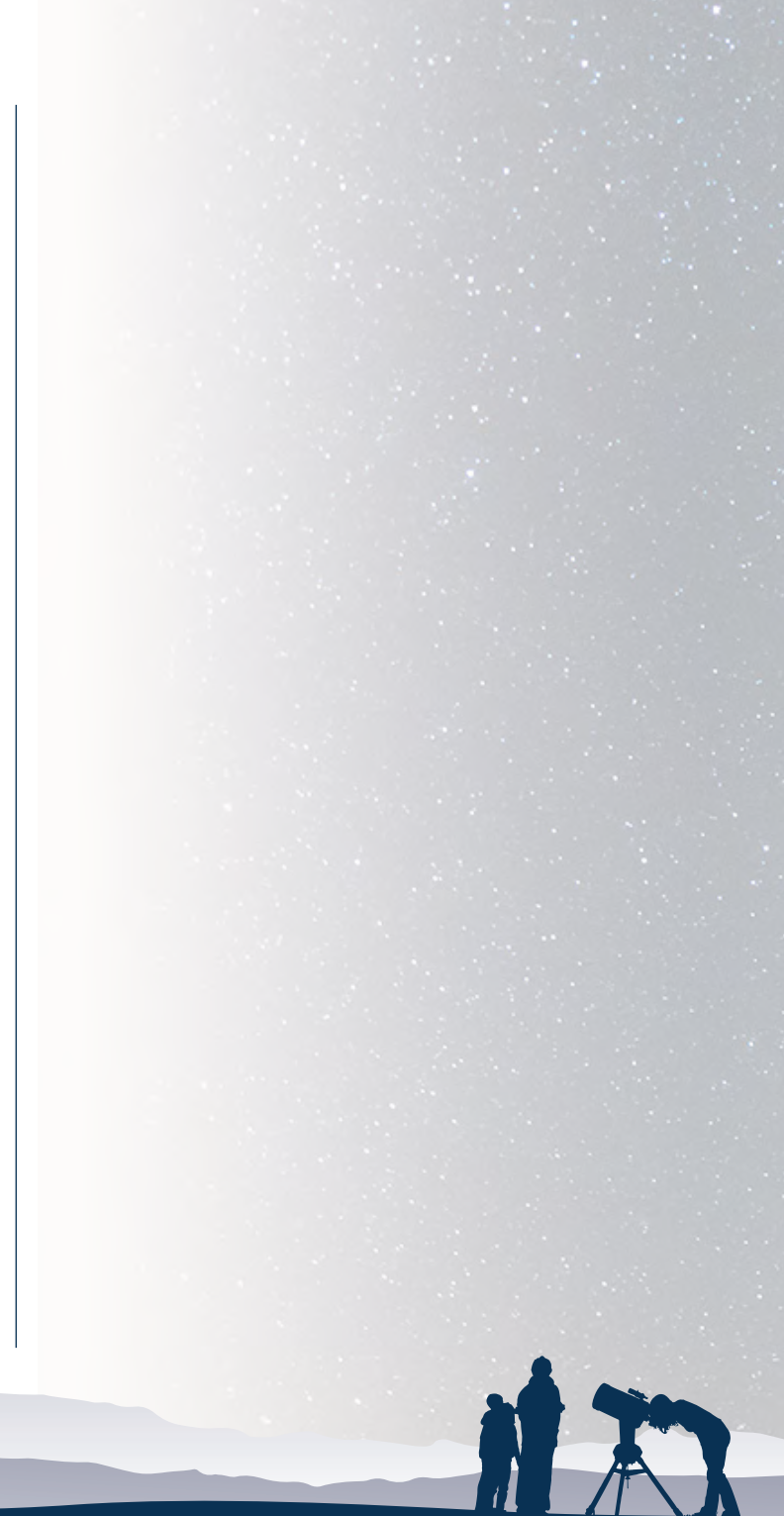
# THE DARK NIGHT SKIES OF CRANBORNE CHASE AONB

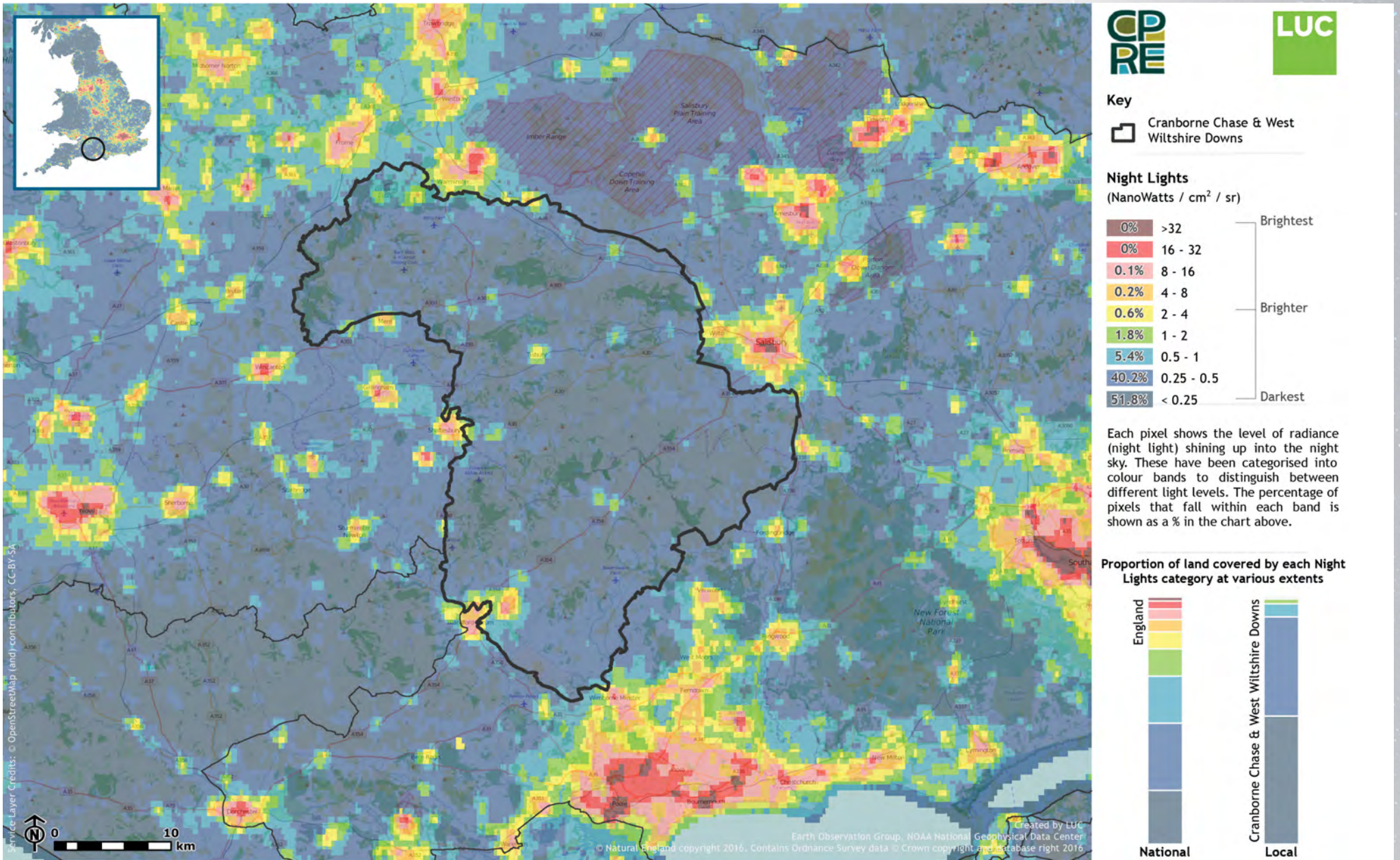
## SECTION SUMMARY

- The AONB enjoys some of the darkest skies in the south of England.
- 52% and 40% of the AONB falls within the darkest and next darkest of the CPRE's 'Night Blight' map categories, respectively.
- Most SQM readings within the AONB fall into at least the IDA bronze level, and many are silver level.
- SQM readings achieve bronze level at the AONB boundary close to some of the outlying urban conurbations.
- The AONB's topography forms a natural barrier to light pollution from surrounding urban areas.
- A tranquillity mapping exercise undertaken in 2008 closely matches good quality dark sky readings.
- The chief threats to dark night skies in the AONB are the urban conurbations that sit just outside its boundary.

**Relevant to IDA criteria: E(E), M(D), M(M)**

**Related appendices:** C.1 Full set of sky quality meter readings





▲ **Fig. C1:** CPRE 'Night Blight' map, cut to Cranborne Chase AONB. The bar chart (in the key, bottom right) clearly shows the good quality of the AONB's night skies compared with England as a whole.



## Introduction

We know that Cranborne Chase AONB has some of the darkest skies in the south of England. This is backed up by evidence derived from satellite imagery and sky quality meter (SQM) readings. We have also examined how topographical features of the AONB both positively enhance dark night skies, and help in minimising light pollution.

## The ‘Night Blight’ map

The CPRE’s ‘Night Blight’ map (2016; Fig. C1) is a detailed recent satellite survey used for understanding the darkness of our skies above the AONB. It is a good indication of their quality: a total of 52% and 40% of the AONB falls within the darkest and next darkest of the CPRE’s categories, respectively.

We have tested the accuracy of the CPRE map by:

- Taking and mapping SQM readings over several years, since 2014.
- Using SQM readings to investigate how dark night skies increase in quality with distance from urban conurbations and villages within the AONB.
- Investigating the impact of the chief light pollution threats to the AONB.
- Analysis of the impact of topography, both on forming natural barriers to light pollution, and on actively promoting the quality of the night sky.

## Sky quality meter readings

With the unfailingly generous support of the Wessex Astronomical Society, whose members have travelled Cranborne Chase on many a cold and dark winter’s night taking SQM readings, we have sky quality data from 2014 onwards.

## Methodology

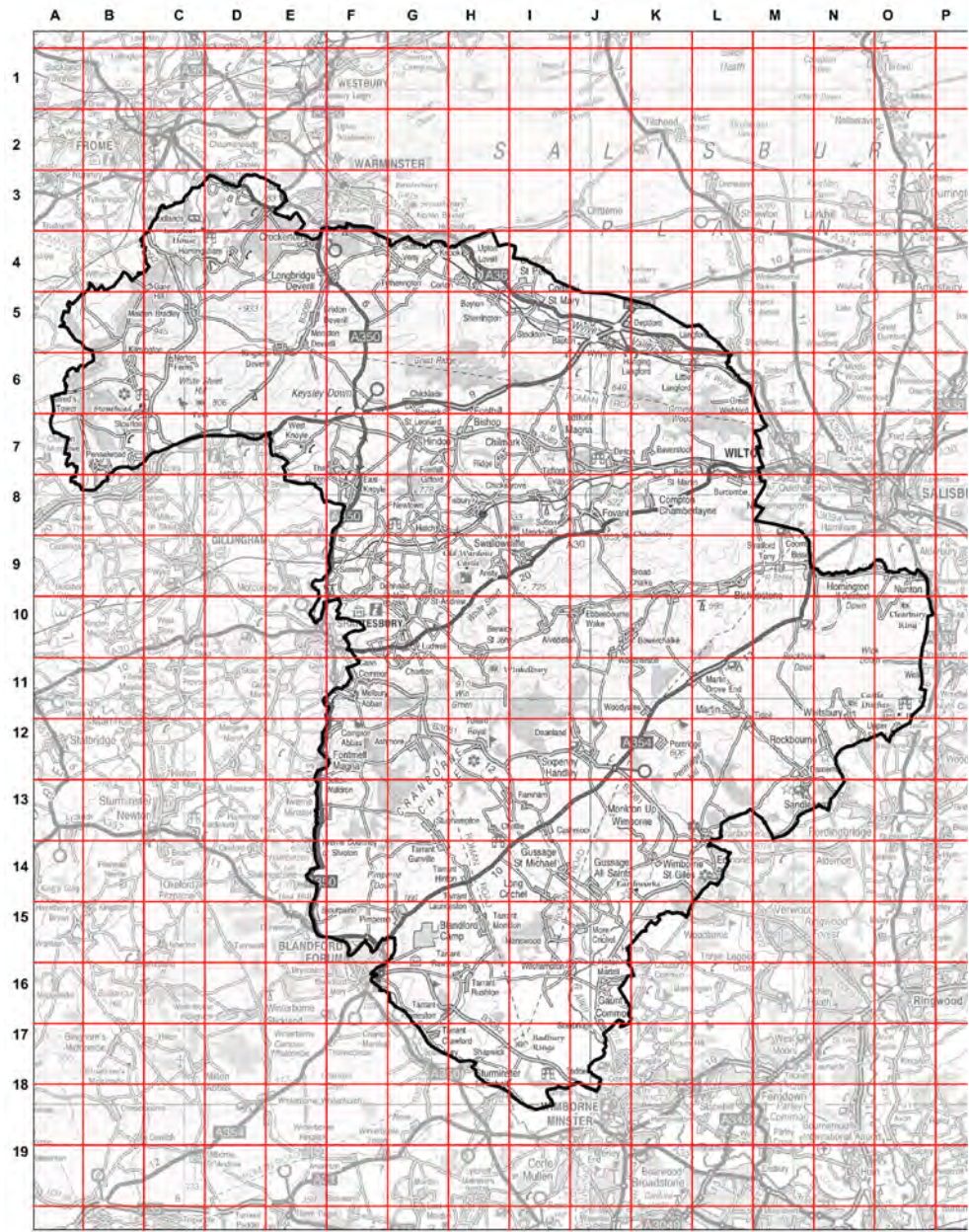
A programme of sky quality meter readings was begun in 2014. We used, and are continuing to use, Unihedron SQM-L (Sky Quality Meter with Lens), five of which were purchased from First Light Optics (Exeter, UK). The SQM-L measures sky brightness in visual magnitudes per arcsec<sup>2</sup>. SQMs were calibrated to ensure uniform performance.



### *Field methodology – taking the readings*

In the first two years, we simply assured reasonable coverage of the AONB, and apportioned different areas to specific individuals. From 2016, we set up a more structured field grid system of 1.7 km squares which we used to take field readings, with an easting and a northing recorded within each square. Each participant was allocated a number of squares. This has enabled a reasonably consistent picture of the AONB’s dark sky quality to be developed, and provides a robust basis for future monitoring, and for developing the core and buffer areas of the proposed reserve (Section D). Figure C2 shows the field grid configuration across the AONB. Readings were taken at varying locations in most field squares within the AONB at least once over the autumn/winter months (October to February). There were some exceptions due to relative inaccessibility, or changing weather conditions on nights readings were being taken. Readings made before the grid system was established were retrospectively allocated to the appropriate square. Participants followed the standard instructions for using the SQM-L ([http://unihedron.com/projects/sqm-l/Instruction\\_sheet.pdf](http://unihedron.com/projects/sqm-l/Instruction_sheet.pdf)).





◀ **Fig. C2:** Map of AONB overlain with grid of 1.7 km squares used to take readings. Readings were taken in squares wholly or partly within the AONB boundary (thick black line).



## Analysis of SQM readings

Appendix C.1 gives an extract from the raw data for the SQM measurements, showing the IDA quality level (gold, silver or bronze) and Bortle Class for each by landscape character type.

We used GIS to map each reading to an Ordnance Survey map of the AONB area. Readings were then averaged across 0.5-km squares (using readings from all years). The advantages of this method are that it enables anomalies to be smoothed out. Future monitoring analysis will therefore pick up averaged trends over time. The potential risk is that significant changes in individual readings for a particular area will be underplayed. We have mitigated this by maintaining the list of actual readings (Appendix C.1), and checking there are no inconsistencies. Figure C3 is a map showing the averaged readings by 0.5-km square.

We also undertook some further analysis of the readings, as follows.

1. An analysis was undertaken of how SQM readings change moving from urban centres outside the AONB boundary, across the boundary, and into the AONB interior. Raw (i.e. actual, not averaged) readings were used for this, so that the data points could be pinpointed to specific locations.
2. We analysed SQM readings in and around two villages, to investigate if and by how much light pollution lessened around a village centre. Raw SQM data was used for the same reason as above.
3. We used GIS to prepare an AONB map highlighting areas that were  $\geq 0.5$  km from main roads (i.e. that were relatively remote; Fig. C14). This was to determine if there was any correlation between remoter areas and 'darker' SQM readings.

***“We need to preserve our skies for future generations.”***

Feedback from Dark Sky Pledge responses.

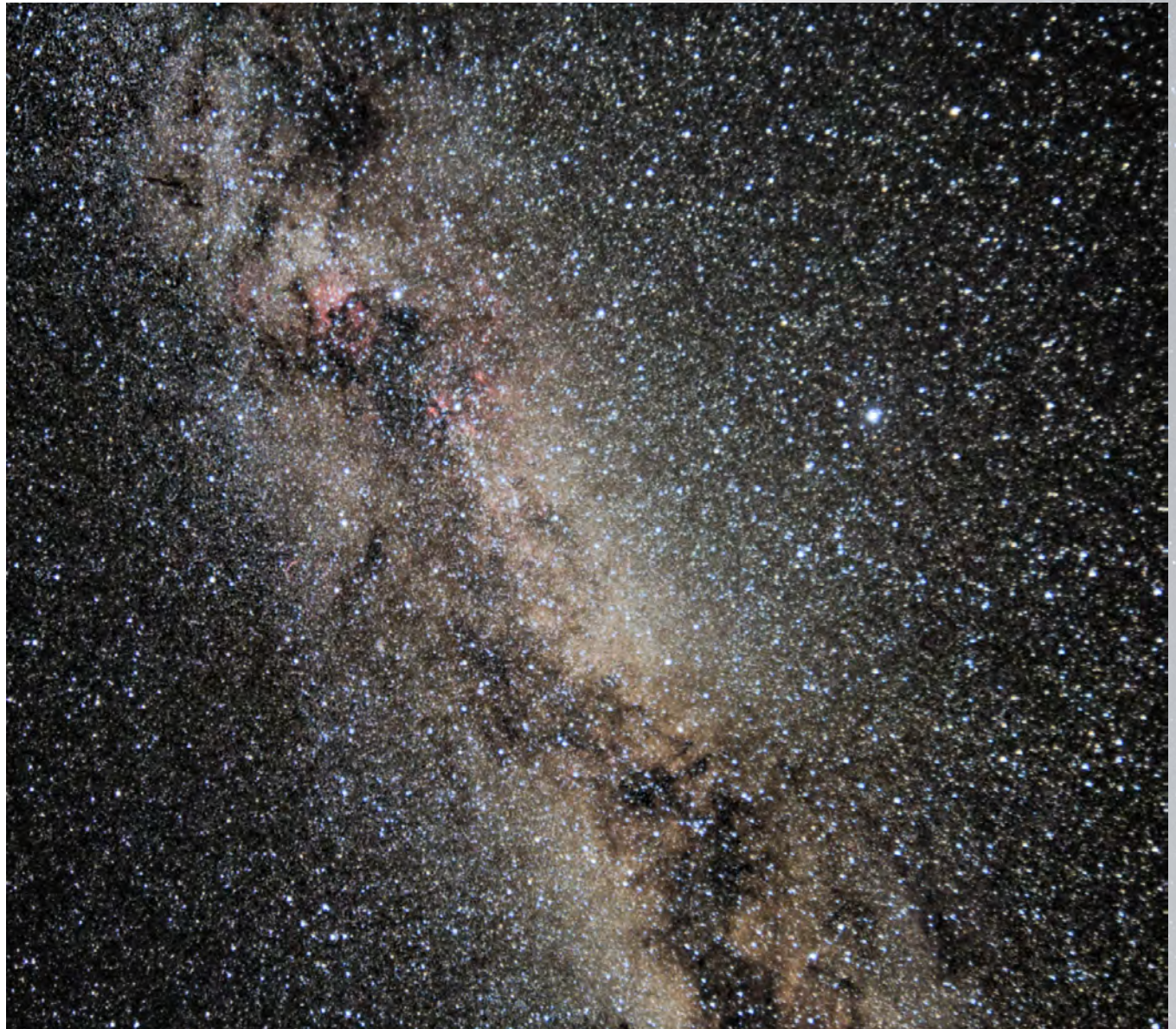




## Overall SQM results

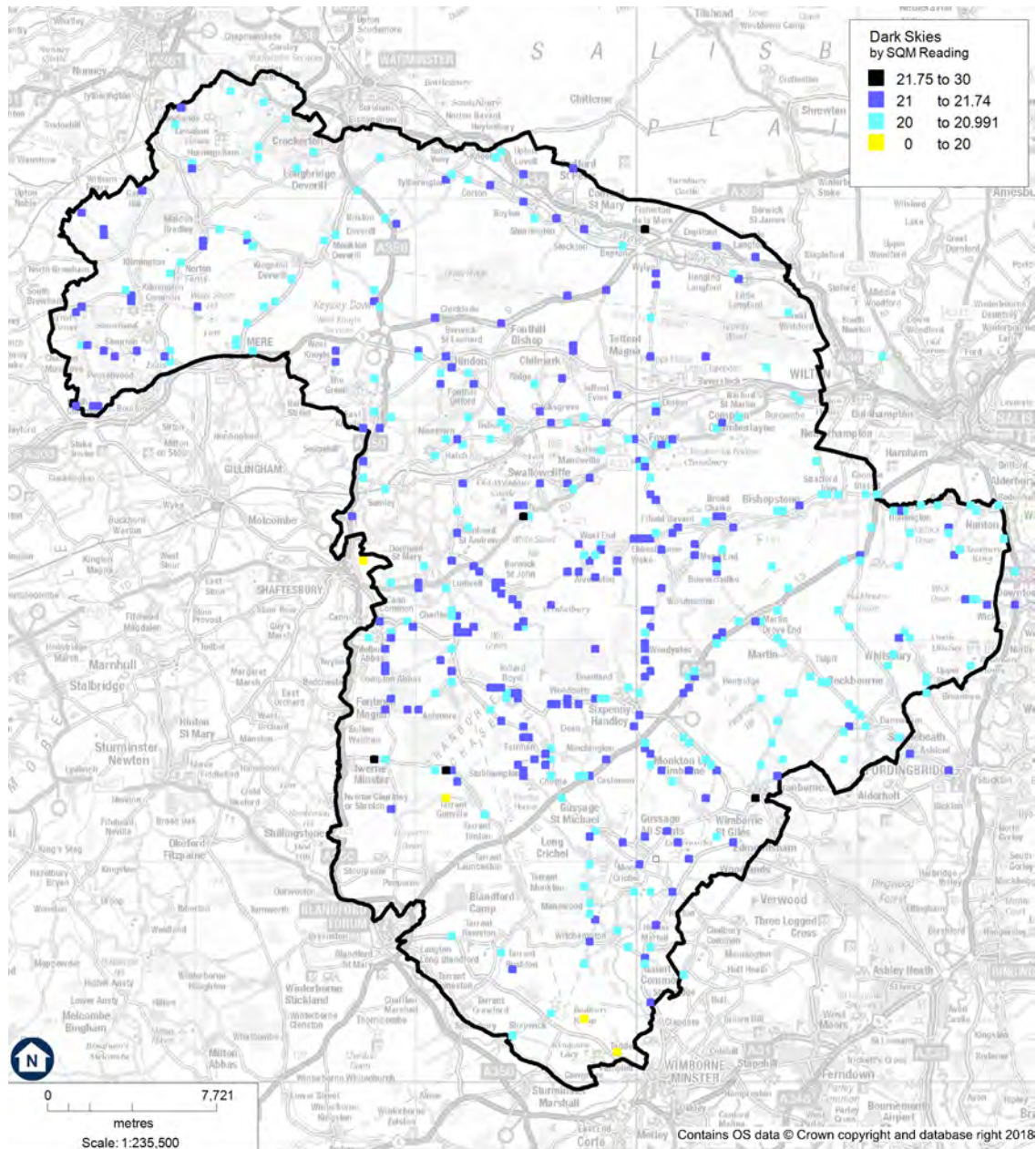
The SQM readings reported in Figs. C4 and C5, and in Appendix C.1, show that Cranborne Chase AONB enjoys a good quality of dark skies:

- 50.36% of the readings correspond to the IDA's silver tier level, 48.45% to bronze and a small number (1.19%) to gold (this is based on readings taken across all monitoring years to date).
- The majority of the silver tier readings (21.00 to 21.74) are concentrated in a fairly central area, focussed on the following landscape character areas: the Ebble River Valley, the wooded chalk downlands of Cranborne Chase, Fovant Terrace (greensand), and the northern parts of the Southern Downland Belt. The Stour and Avon Tributary Valleys in the south of the AONB have also yielded some dark readings.
- Readings have been made at accessible locations since 2014, and in different months over the winter period; the results have nonetheless been quite consistent (Appendix C.1).



▲ **Figure C3:** The Summer Triangle and Milky Way photographed from Badbury Rings, one of our top ten stargazing locations. This site is under 2 km from the AONB's southern boundary (© Peter Rusling).





◀ **Fig. C4:** Dark sky SQM readings, showing locations and status. The readings indicate a darker central area (the area below the approximate middle of the AONB). However, other readings also generally achieve an SQM value of  $\geq 20$ , with very few exceptions. In Appendix C.1, we have provided a table of all SQM readings.



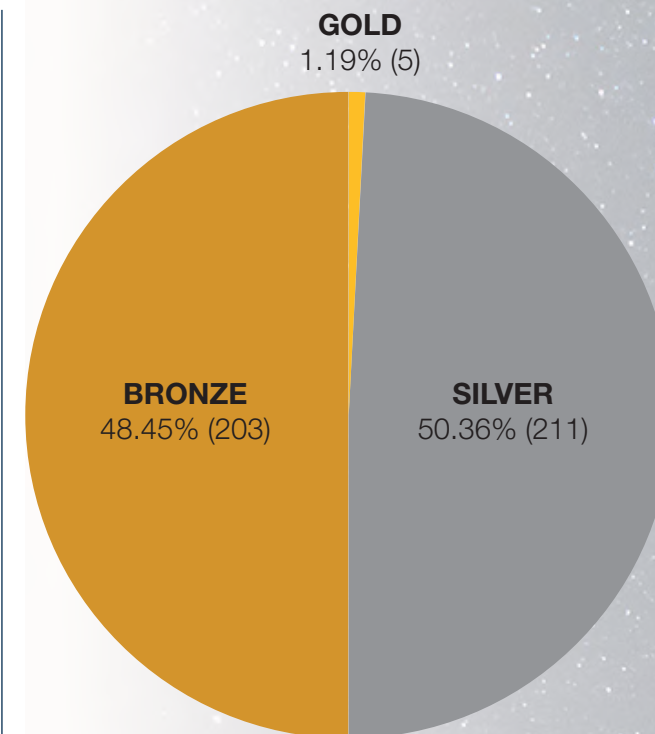
## SQM results by landscape character type

Given the importance to AONBs of their landscape character assessment, we were interested to compare SQM results between each of our landscape character types.

Firstly, we analysed the number of SQM measurements taken per landscape character type as a proportion of the total measurements. Then, we calculated the proportion of the AONB's area occupied by each landscape character type. We compared the two proportions (SQM readings and land area), to ensure that the proportions were comparable, which was broadly the case (Table C1). We secondly considered the highest, lowest, and average SQM reading for each landscape character type (Table C1). These results suggest some similarity between the different landscape character types. We were a little surprised by this finding. For example, we would have expected the more remote chalk escarpments to host the darkest SQM readings. This result may be because the smaller number of readings taken in this landscape character type (due to their relative inaccessibility) have affected the findings, even though the proportion of readings taken is consistent with the proportion of the total AONB area occupied by the escarpments. It may also be that the height of the escarpments means they are less 'sheltered' from light intrusion from urban areas outside the AONB boundary, even though they provide protection to lower lying areas. We will need to test these assumptions in future years by taking more readings from the escarpments; the differences, however, do not appear significant.

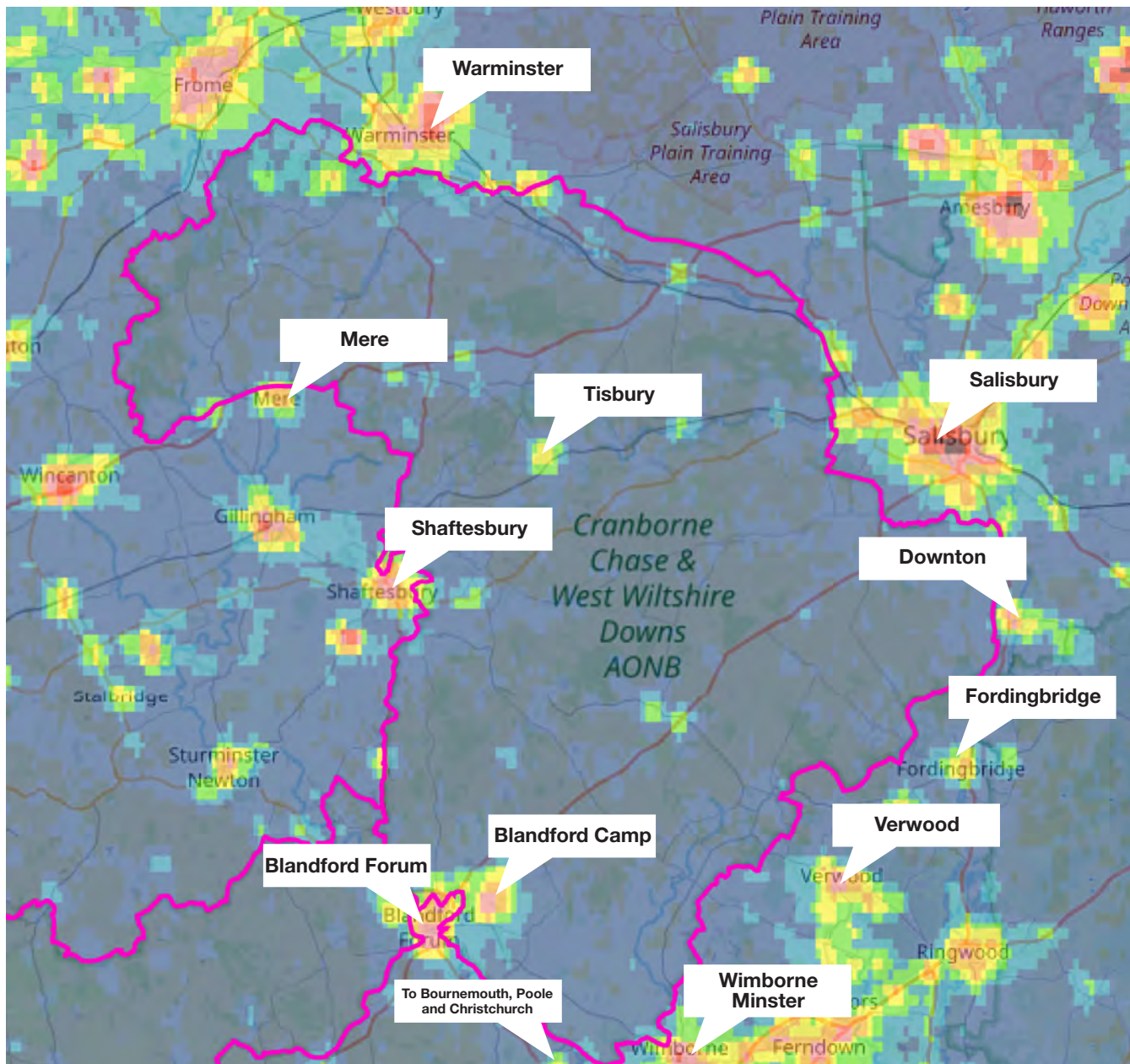
Landscape character type	Number of readings	% of total readings	Area km <sup>2</sup>	% of total AONB area	Highest reading	Lowest reading	Average reading
<b>Chalk Escarpments</b>	14	3.37	51.80	5.28	21.89	20.76	21.05
<b>Open Chalk Downland</b>	124	29.81	356.29	36.32	21.75	18.62	20.95
<b>Wooded Chalk Downland</b>	47	11.30	79.70	8.12	21.53	20.91	21.13
<b>Downland Hills</b>	15	3.61	43.34	4.42	21.36	20.32	20.80
<b>Chalk River Valleys</b>	98	23.56	195.59	19.94	21.83	19.62	20.96
<b>Greensand Terrace</b>	51	12.26	91.86	9.36	22.00	20.51	21.01
<b>Greensand Hills</b>	37	8.89	98.12	10.00	21.59	20.55	21.06
<b>Rolling Clay Vales</b>	30	7.21	64.31	6.56	21.28	20.51	20.95

**Table C1:** Analysis of number and proportion of readings per landscape character type. Figures are also given for highest, lowest and average reading in each landscape character type.



**▲ Fig. C5:** SQM reading totals: Proportion and number of gold, silver, and bronze readings (figures derived from all readings from all monitored years to date).





◀ **Fig. C6:** CPRE ‘Night Blight’ map of Cranborne Chase AONB, with main light pollution threats labelled. This Figure is an enlarged version of Fig. C1.

Figure C6 (the ‘Night Blight’ map) clearly shows the more brightly lit urban areas, which mainly lie just outside the AONB boundary. These are the chief threats to our night sky quality. They are the city of Salisbury (population 45,000), the towns of Warminster (17,000), Fordingbridge with Sandleheath and Alderholt villages (10,500), Verwood (15,000), Wimborne Minster (15,500), Blandford Forum (8750), the village of Downton, which has a small industrial estate (2500), the small town of Mere (3000), and, to the south, the larger urban sprawl of Christchurch (45,800), Poole (148,000) and Bournemouth (187,500). This contrasts starkly with the much darker interior of the AONB. So why does the AONB enjoy such dark skies?



# Analysis of light pollution threats and mitigation

## **Light pollution from urban centres outside the AONB boundary: how far does it extend?**

In the winter months of 2018-19, we took some additional SQM readings, and also used some of the readings taken in the field grid squares, in order to investigate the distance taken for light spillage from the outlying urban areas to reduce across the AONB boundary and into its interior. These were taken from four urban centres: Warminster in the north, Shaftesbury in the west, Wimborne Minster in the south, and Fordingbridge in the east.

The distances of the SQM measurements from each urban centre varied according to available routes and readings, and the health and safety aspects of stopping beside roads in a suitable parking place. Readings were taken at the AONB boundary adjacent to an urban centre, and then at various distances travelling in as straight a route as possible (Fig. C7). 'As the crow flies' distances were calculated using the 'measure distance' tool in Google Maps.

Readings used for this exercise were from various dates, meaning there could have been some differences in conditions. Although readings were taken on clear, moonless nights, there may be atmospheric differences between dates that would cause, for example, a higher or lower scattering of light. This is a drawback of the analysis as presented and, if this exercise is repeated in future, we will look to refine the method so that readings for each route are taken on the same date. Nonetheless, the analysis of the current data can be reasonably taken to indicate a general trend of improved SQM readings as routes progress from an urban centre into the AONB interior.

Urban centre readings were taken in Fordingbridge and Wimborne, but not in Shaftesbury and Warminster, due to time and weather constraints. However, it is reasonable to assume the readings would be similar to the urban areas of Fordingbridge and Wimborne (16.72 and 17.92 mags/arcsec<sup>2</sup>, respectively).

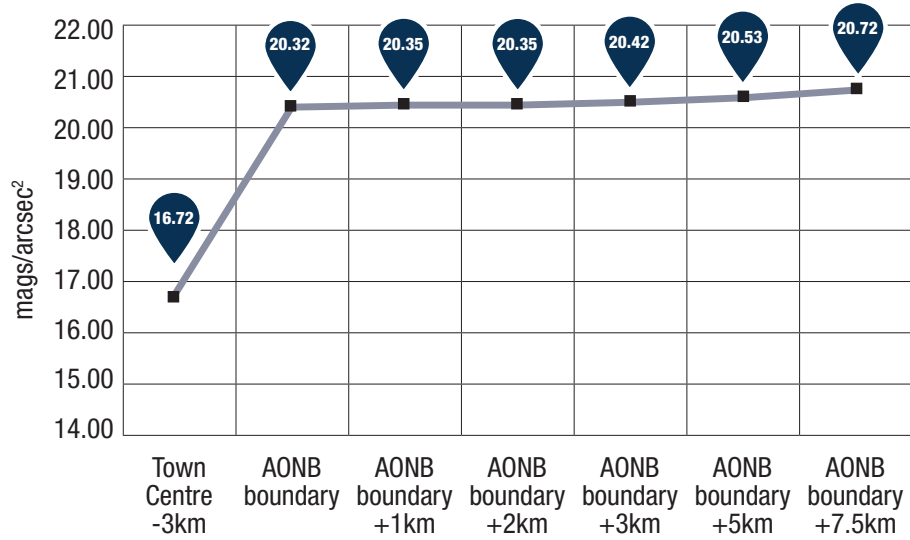
Looking at Fig. C7, it is interesting to compare the results for travelling northwest from Fordingbridge with those for travelling southeast from Warminster. Night sky quality on both routes would be expected to be affected at least partly by skyglow and light intrusion from Salisbury to the northeast of the AONB. However, whereas the readings northwest from Fordingbridge 'flatten out' to an average of approximately 20.5 mags/arcsec<sup>2</sup> (excluding the town centre), those moving southeast from Warminster show an increasing trend, and in fact rise to above 21 mags/arcsec<sup>2</sup> in the eastern part of the route closer to Salisbury. Comparing this with the topography map (Fig. C13), one reason may well be that the landscape northeast of Fordingbridge has a relatively lower topographical profile, thus providing less masking of light pollution from Salisbury. In contrast, the escarpment running along the north of the AONB provides a natural barrier to light intrusion south east of Warminster.

The route north from Wimborne also shows SQM results flattening out, but to an average of around 21 mags/arcsec<sup>2</sup> (possibly because there is some positive affect of topography around the river valleys, although the overall topography is relatively low). The Shaftesbury route again benefits from higher topography to its east helping to mask light intrusion, with an overall increasing trend for the SQM results as the route moves eastwards.

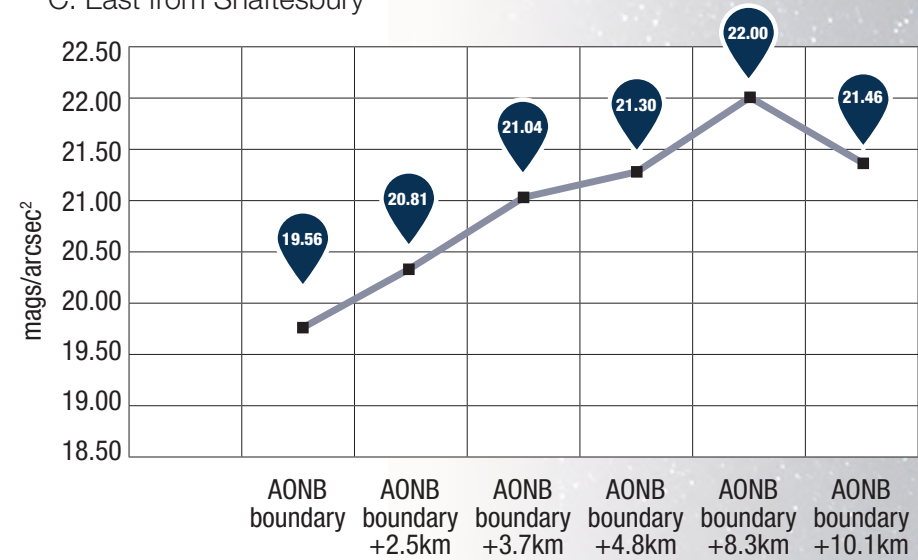
Overall, the results shown in Fig. C7 demonstrate that light pollution is lessened, and a good quality (at least bronze level, and silver in a significant proportion of cases) of dark night skies found at generally around 2 km in from the AONB boundary, even in relative proximity to an urban centre. Readings even at the boundary are generally at least 20 mags/arcsec<sup>2</sup>.



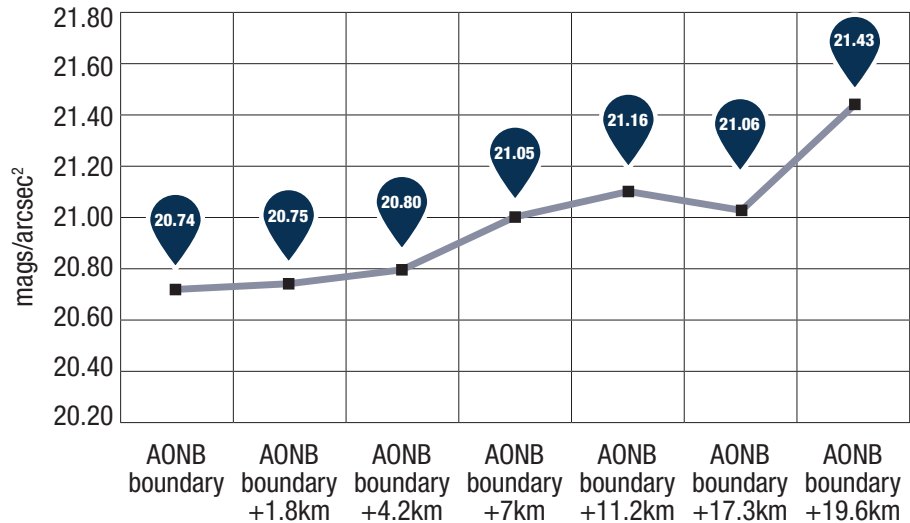
A. Northwest from Fordingbridge



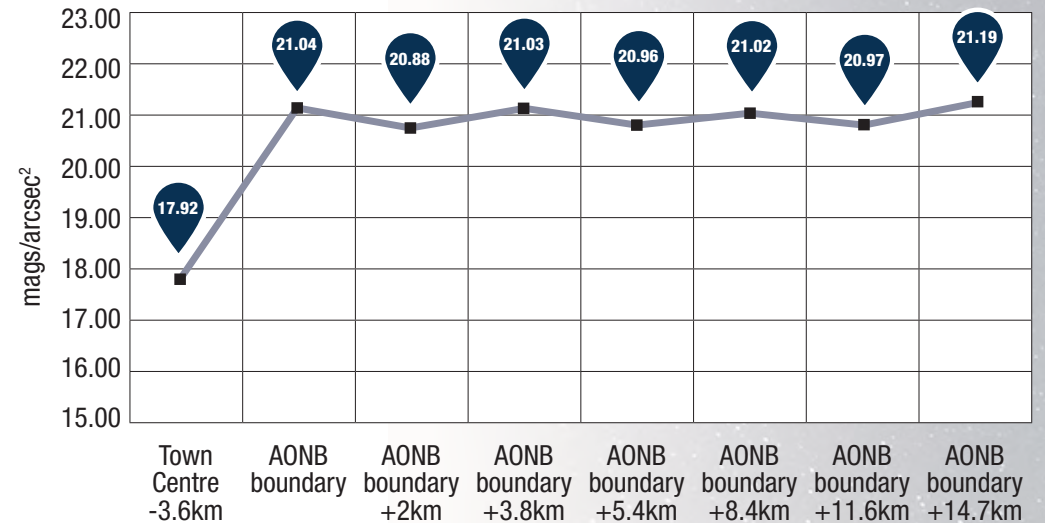
C. East from Shaftesbury



B. Southeast from Warminster



D. North from Wimborne



▲ **Fig. C7:** Graphs showing progression of readings and locations from which readings were obtained from urban centres (A. Fordingbridge; B. Warminster; C. Shaftesbury; D. Wimborne) outside the AONB boundary moving into the AONB. Readings were taken along a route as close as possible to a straight line, but road direction and access meant this was not always possible. Final 'as the crow flies' distances were calculated using the 'measure distance' tool in Google Maps.



▼ **Fig. C8:** Photography illustrating the sky view from three of our top ten stargazing locations that are close to the AONB boundary.



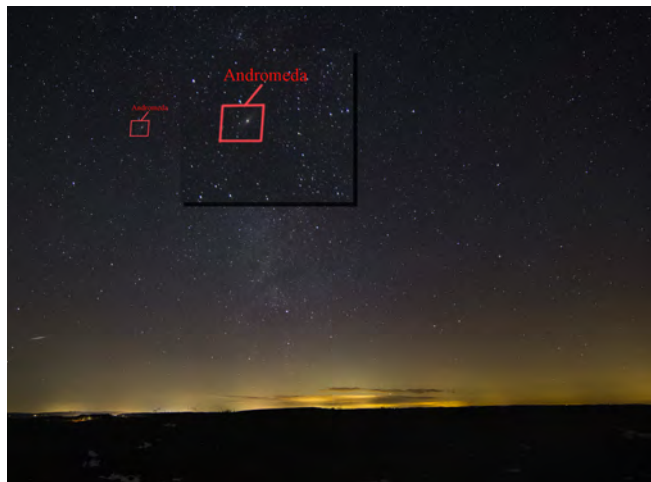
▲ a(i) Badbury Rings, looking east. Orion is clearly showing in the night sky. © Paul Howell/Pictor Images



▲ b(i) Fontmell and Melbury Downs looking north, with the skyglow from Shaftesbury visible beneath the Milky Way. © Paul Howell/Pictor Images



▲ b(ii) Looking south from Fontmell and Melbury Downs, Comet Wirtanen was clearly visible above Blandford Forum lights. © Paul Howell/Pictor Images



▲ a(ii) Badbury rings, looking west. Despite the sky glow from Wimborne and Bournemouth/Poole, the Andromeda Galaxy was nonetheless still visible higher in the sky. © Paul Howell/Pictor Images



▲ (c) A panoramic photograph taken at Sutton Veny. The sky glow to the left of the image is from Warminster. © Paul Howell/Pictor Images



## Sky glow

We were also interested in examining the effects of sky glow from the urban conurbations. While the SQM readings reveal the quality of the AONB's night skies, the sky glow from places such as Salisbury, Shaftesbury, and even further south from Bournemouth, and to the east, over the Solent, from the large city of Southampton, is evident in the night sky. In the winter of 2018-19, we commissioned photographs from three of our top ten stargazing locations, selected as being relatively close to the AONB boundary: Sutton Veny, Fontmell and Melbury Downs, and Badbury Rings (Fig. C8). The photographs illustrate the sky quality looking outside and into the AONB interior.

The panoramic photographs do reveal an impact of sky glow, as would be expected given the proximity of urban areas. We consider that this is at least partly mitigated by the topography (see later in this Section). Also, as set out in Section E, we have been working with our partner local authorities for a number of years to minimise light pollution. Changes to street lighting, including upgrading and the introduction of part-night dimming or switch-off, have had a positive influence. We expect to continue working with our partner LPAs to further improve this in future years.

## Light pollution study 2007

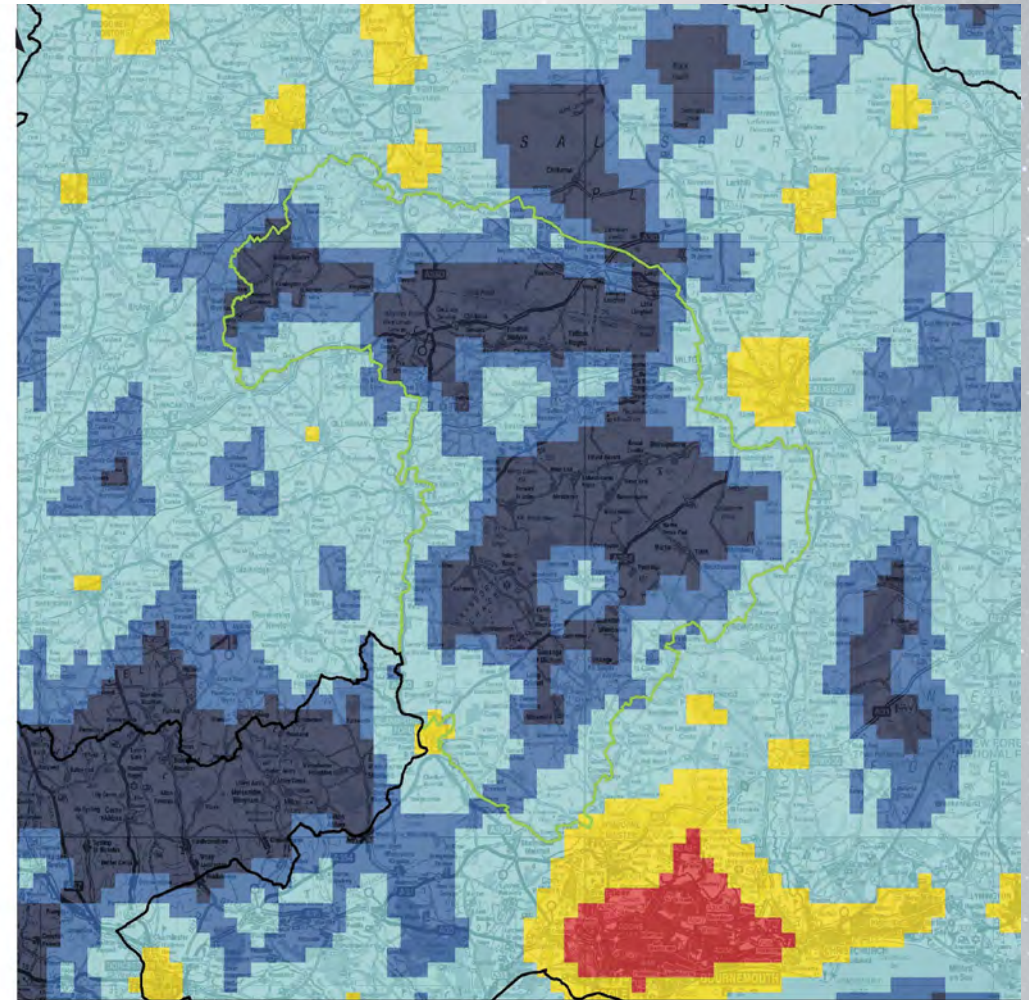
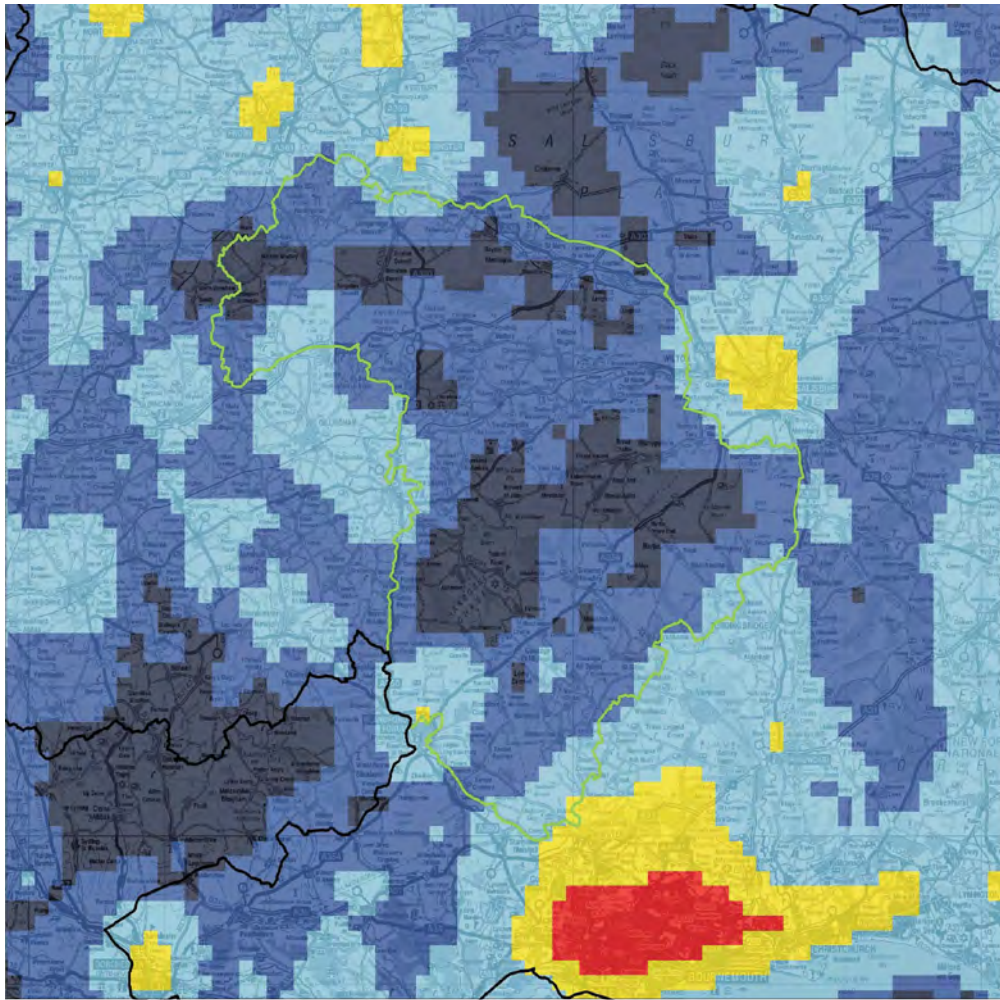
The above results reflect the findings of an earlier light pollution desk study commissioned by the AONB from Entec UK Limited in 2007 (Dark Skies and Light Pollution Study: Final Report, June 2007). The purpose was to identify the principal lighting sources within the area and provide guidance on potential solutions. The report identified the following sources of light pollution:

- Towns on the AONB border. These were identified as a source of both sky glow and scenic intrusion.
- Villages and military camps. The largest villages (Tisbury and Sixpenny Handley) were noted as radiating sufficient light to raise saturation levels detected in satellite maps. Blandford Camp is also a source of light pollution.
- Hamlets and open countryside. The report notes that, while pin-pricks of light from a farmhouse or small group of houses would not normally be considered an intrusion, poorly shielded lights and floodlights can be a source of light pollution.
- The study noted, on the basis of comparing satellite images from the years 1993 and 2000, that the areas of highest light intensity (just outside the AONB boundary) expanded slightly between the two periods. Despite this, the report noted:

*"However, one surprising factor is that the dark areas (i.e. of value < 1.7), notably the one existing over the Great Ridge and around the nearby A303 [in the north of the AONB], appear to have enlarged during the period between the two dates of the imaging surveys, whilst light intensity has increased in the village communities centred upon Tisbury and Sixpenny Handley." (See Fig. C9)*







- 0-1.7
- 1.7 - 50
- 50 - 150
- 150 - 240
- 240 -255
- Cranborne Chase AONB
- Other AONB boundary

CPRE/LUC nighttime satellite imagery. Data obtained and manipulated/ analysed by and on behalf of CPRE by Land Use Consultants and Nigle Press Associates

Satellite images from NOAA-NESDIS National Geophysical Data Center

This map is a colour representation of satellite measurements of artificial light and was created from pixels representing a square kilometre. Light has been measured against a range of 0 to 255 where 0 means the satellite detected no light and 255 means the satellite detector was saturated with light.

▲ Fig. C9: Light pollution satellite imagery of Cranborne Chase dating from 1993 (left-hand image) and 2000 (right-hand image). Both images are extracted from the Entec 2007 report.



## SQM readings in and around AONB villages

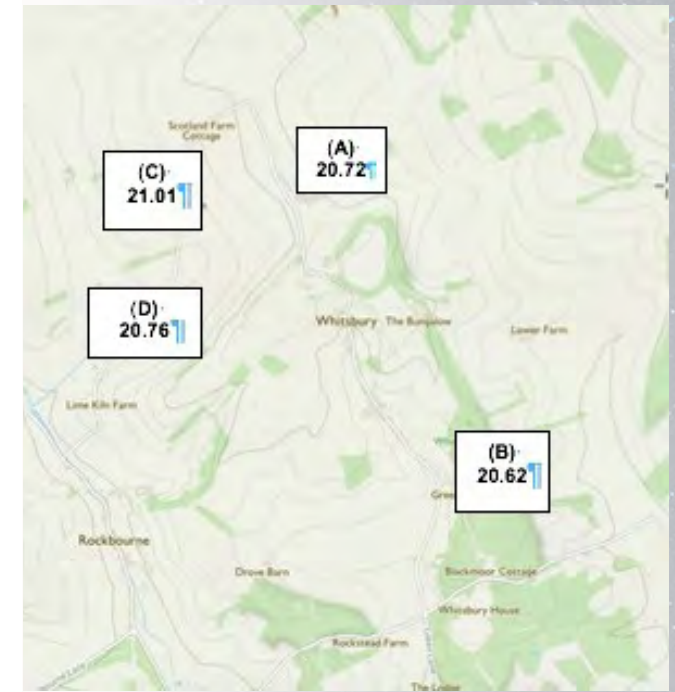
We considered how SQM values changed in proximity to the AONB's villages using two as an illustration. This was undertaken in order to investigate differences in night sky quality between settlements and in the surrounding more rural areas (Fig. C10). This work supports the analysis in Section E, in which the estimated lumen footprint per parish is calculated, indicating that the lumen output is concentrated in the villages rather than the surrounding sparsely populated areas.

Figure C10 is an example of one of the villages sampled in our survey of external lighting (Whitsbury), which shows that readings at the edges of this linear village are at bronze level, with readings further west at silver level. Reference can also be made to Fig. C7A, where the SQM reading for the centre of Damerham (20.35), which lies 2 km within the AONB boundary, continues to increase with distance north west from the village towards the village of Martin.

## How does topography influence the quality of Cranborne Chase AONB's dark night skies?

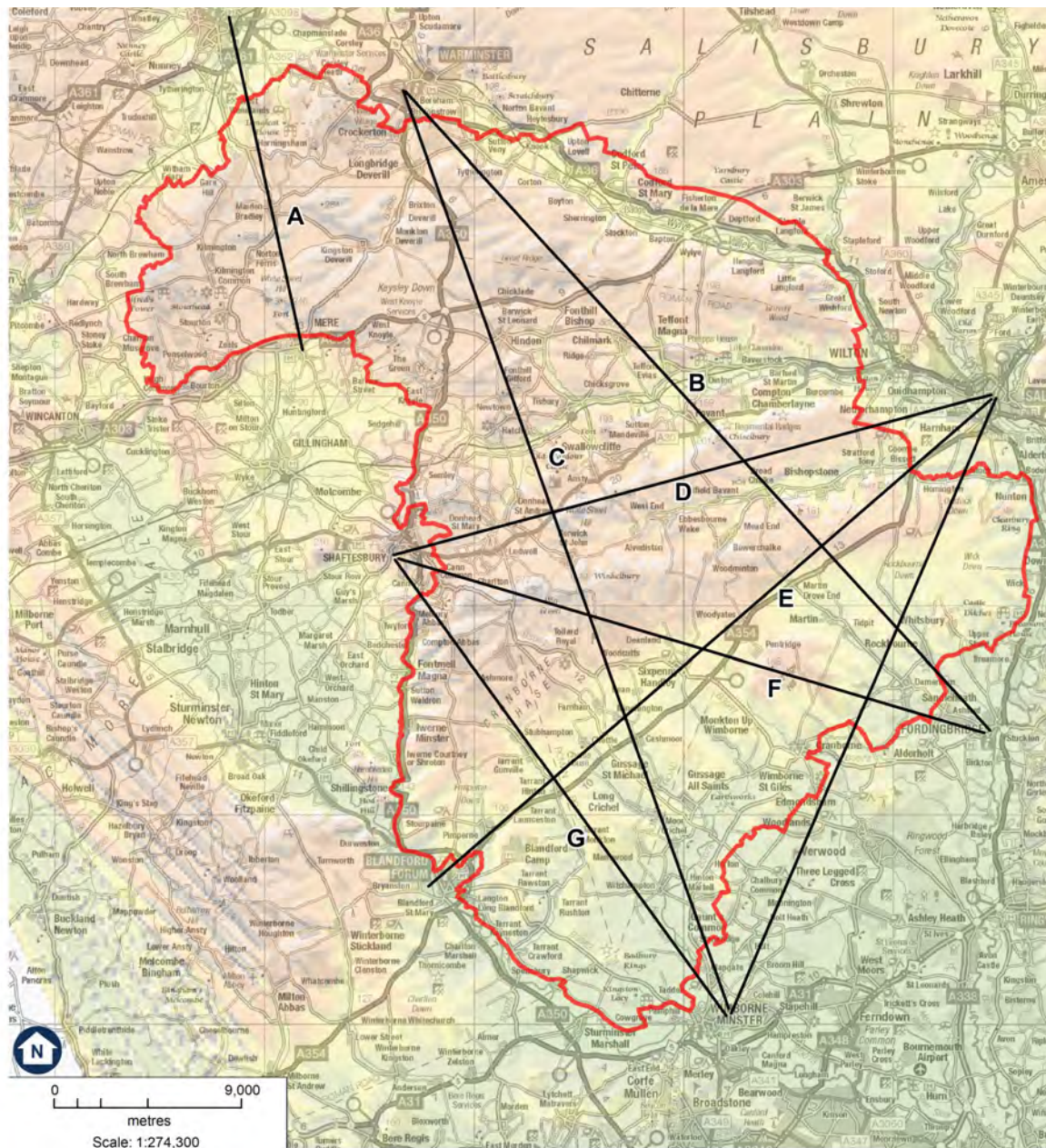
The improvement in night sky quality, both travelling into the AONB from urban centres outside the AONB boundary, and around villages within the AONB is largely due to topography. Cranborne Chase is characterised by rolling vales, river valleys, and relatively uninhabited higher ground. In the interior of the AONB, many villages lie within valleys, meaning even the relatively low level of light pollution they cause is mitigated by the topography. Towards the AONB boundary, the rise and fall of the topography similarly helps to mask the light spill from neighbouring urban areas (Fig. C13).

In order to examine the effect of topography, we selected seven topographical cross sections across the AONB (Fig. C11), that are representative of the different landscape character types. We then prepared corresponding cross sections showing the topography (Fig. C12), and also highlighting features and settlements along each profile.



▲ **Fig. C10:** SQM readings in and around Whitsbury, one of the villages sampled in the audit of external lighting. Whitsbury is in the landscape character type: Downland Hills. It is a linear village (c. 1.9 km long), and readings were taken at its northern (A) and southern (B) edge, in both cases close to housing. Readings (C) and (D) are 0.5 km and 1.5 km distant from (A), respectively.





◀ **Fig. C11:** Topographical sections across the AONB:

- A. Frome to Mere (NNW-SSE)
- B. Warminster to Fordingbridge (NW-SE)
- C. Wimborne Minster to Warminster (SSE-NNW)
- D. Shaftesbury to Salisbury (WSW-ENE)
- E. Salisbury to Blandford Forum (NE-SW)
- F. Fordingbridge to Shaftesbury (ESE-WNW)
- G. Wimborne Minster to Shaftesbury (SE-NW)

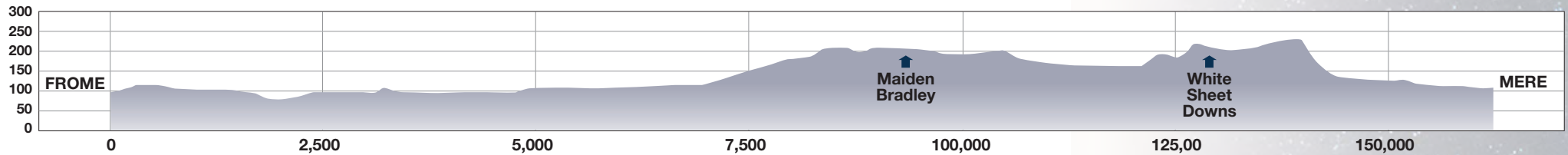
The sections cross the following landscape types, all eight of which are represented in one or more sections:

- A. Greensand Hills, Chalk Escarpments, Greensand Terrace
- B. Greensand Hills, Chalk Escarpments, Open Chalk Downland, Rolling Clay Vales, Greensand Terrace, Chalk River Valley, Downland Hills
- C. Greensand Hills, Chalk Escarpments, Open Chalk Downland, Rolling Clay Vales, Greensand Terrace, Chalk River Valley, Downland Hills
- D. Greensand Hills, Greensand Terrace, Chalk Escarpments, Chalk River Valley
- E. Chalk River Valley, Chalk Escarpments, Wooded Chalk Downland, Open Chalk Downland
- F. Downland Hills, Chalk River Valley, Open Chalk Downland, Wooded Chalk Downland, Chalk Escarpments
- G. Chalk Escarpments, Wooded Chalk Downland, Chalk River Valley, Open Chalk Downland

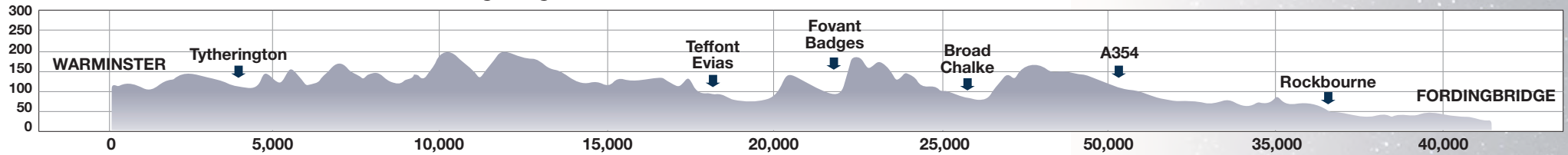


▼ **Fig. C12:** Topographical cross sections. The lettering of each part (A, B, etc.) refers to sections shown in Figure C11. Units of both the horizontal and vertical axes are in metres. Note differences in horizontal scales between different sections, and the difference between the vertical and horizontal scale on each individual section. Vertical scales are exaggerated for ease of reading.

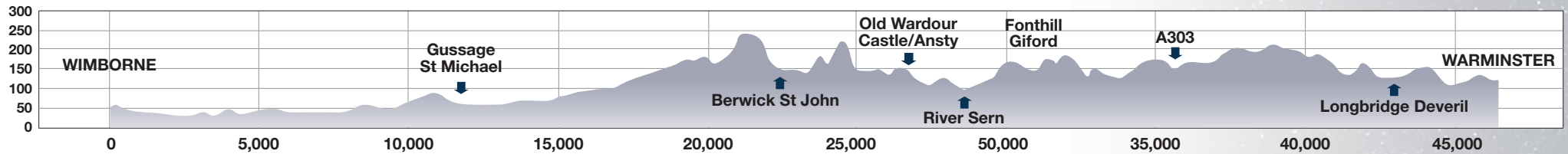
A. Cross Section - Frome to Mere



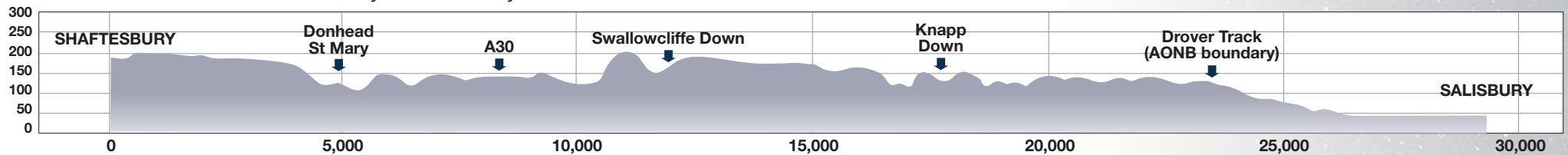
B. Cross Section - Warminster to Fordingbridge



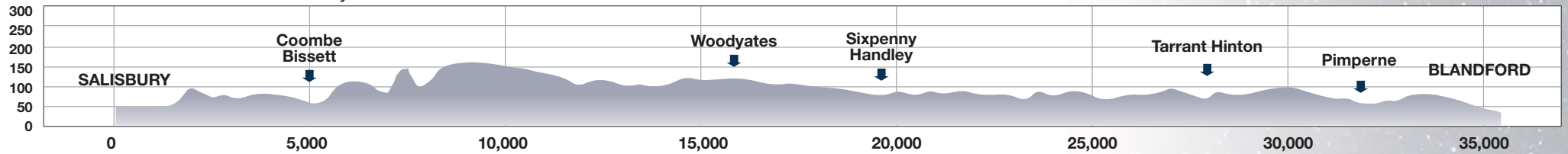
C. Cross Section - Wimborne to Warminster



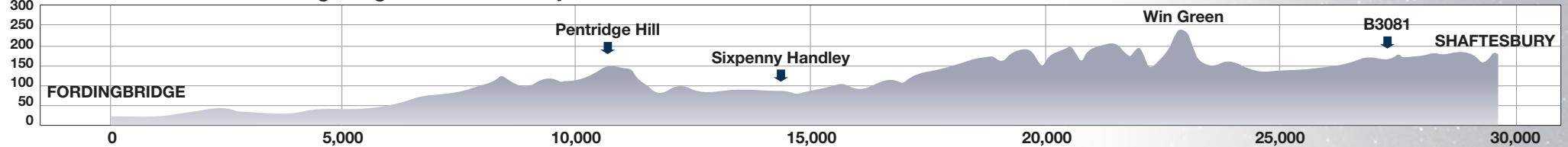
D. Cross Section - Shaftesbury to Salisbury



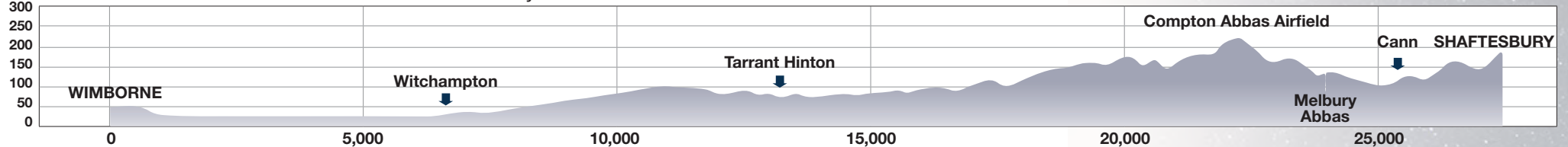
E. Cross Section - Salisbury to Blandford



F. Cross Section - Fordingbridge to Shaftesbury

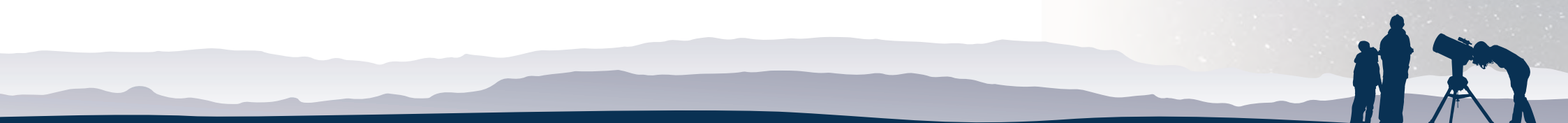


G. Cross Section - Wimborne to Shaftesbury

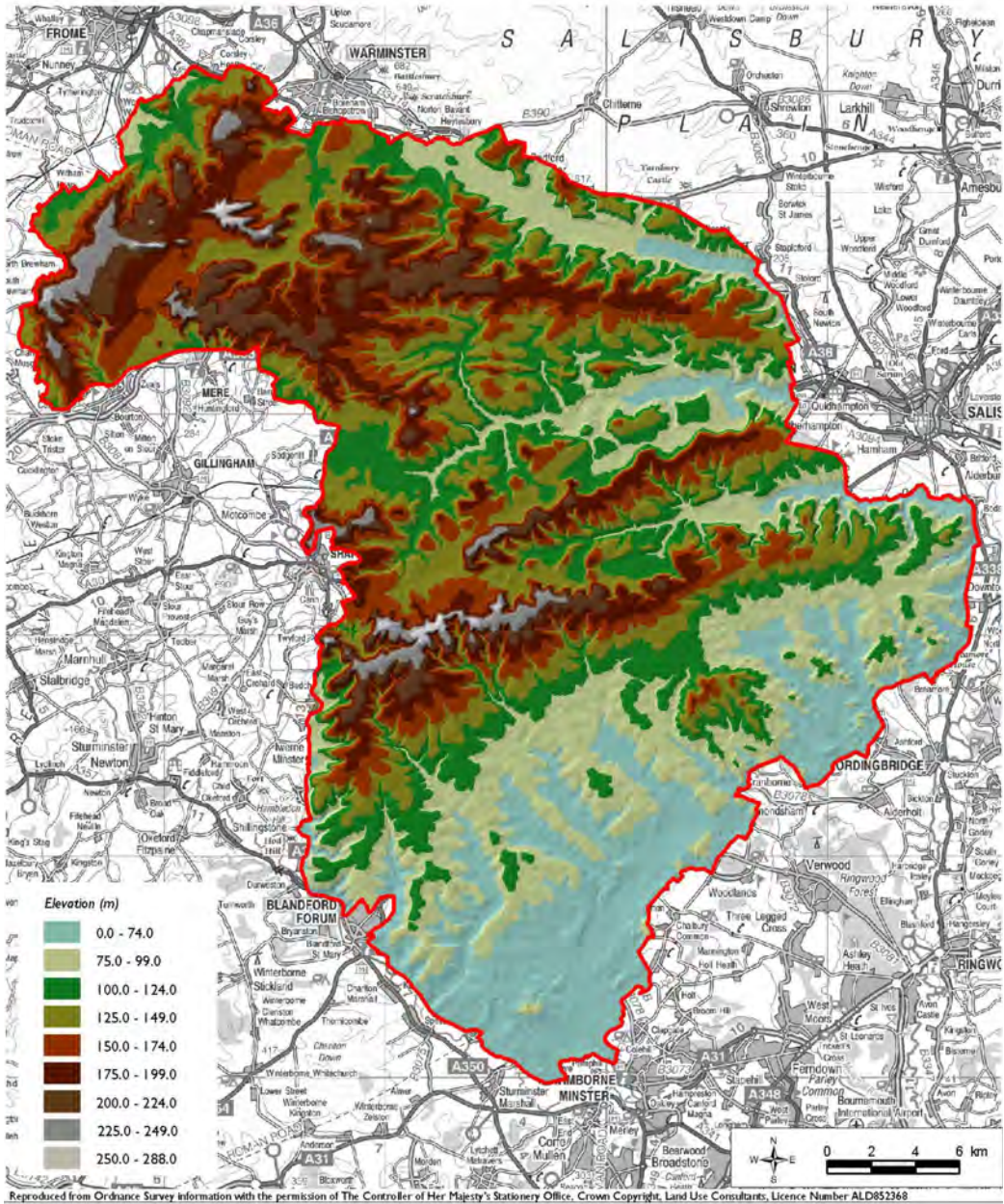


Each of the seven cross sections indicates the rise and fall of the AONB's topography. Cross sections B and C in particular highlight how villages lie nestled in valleys, protecting them from sources of night glow, and lessening any light pollution they may cause.

Topographical profiles closer to the AONB boundary helping to mitigate light pollution from the surrounding areas are shown in, for example, cross section E, where the rise of the land to the west of Salisbury and to the east of Blandford Forum shields the landscape around the villages of Coombe Bissett and Pimperne, respectively. Similarly, the rising topography towards the White Sheet Downs provides a barrier to light pollution from the small town of Mere (cross section A). Similar effects can be seen in cross sections C and G, which indicate the rising profile of the land from Wimborne Minster to the north and north-west. The photograph of the Milky Way and Summer Triangle taken at Badbury Rings (Fig. C3), illustrates how clear the night skies are in this area only a short way within the AONB boundary, despite the closeness to Wimborne Minster and the larger urban conurbation of Poole-Christchurch-Bournemouth further south.



◀ Fig. C13: Topographical map of Cranborne Chase AONB.



The chalk escarpments are a notable feature of the AONB's character, visible from some distance. As illustrated by cross sections B and C (at approximately 10,000 m and 22,000 m, respectively), they are also relatively unpopulated, contributing significantly to night sky quality in the surrounding area because of the lack of light pollution there.

In order to complement this, Fig. C14 shows parts of the AONB that are at least 0.5 km distant from major roads (Fig. C14 A), and how these areas correspond to the SQM readings (Fig. C14 B). The higher escarpment areas (shown on the topographical map in Fig. C13 as shaded darker brown to grey) largely correspond to the main areas distant from roads. These are the areas we would expect, by virtue of their relative remoteness, to make a significant contribution to dark skies in the surrounding area. They also of course form an elevated topographical 'barrier' to light intrusion from surrounding settlements.

## Tranquillity and dark night skies

Interestingly, in the context of this application and the Tranquillity Study undertaken by the AONB in 2008 (see Section A), the areas where higher dark sky readings mainly occur (> 20.99; equivalent to silver status), correspond to areas identified as yielding more positive tranquillity results (Fig. C15). The Tranquillity Study, of course, considered a wide range of factors relating to the landscape, not just being able to see the stars at night.

Nonetheless, the comparison is useful to us in:

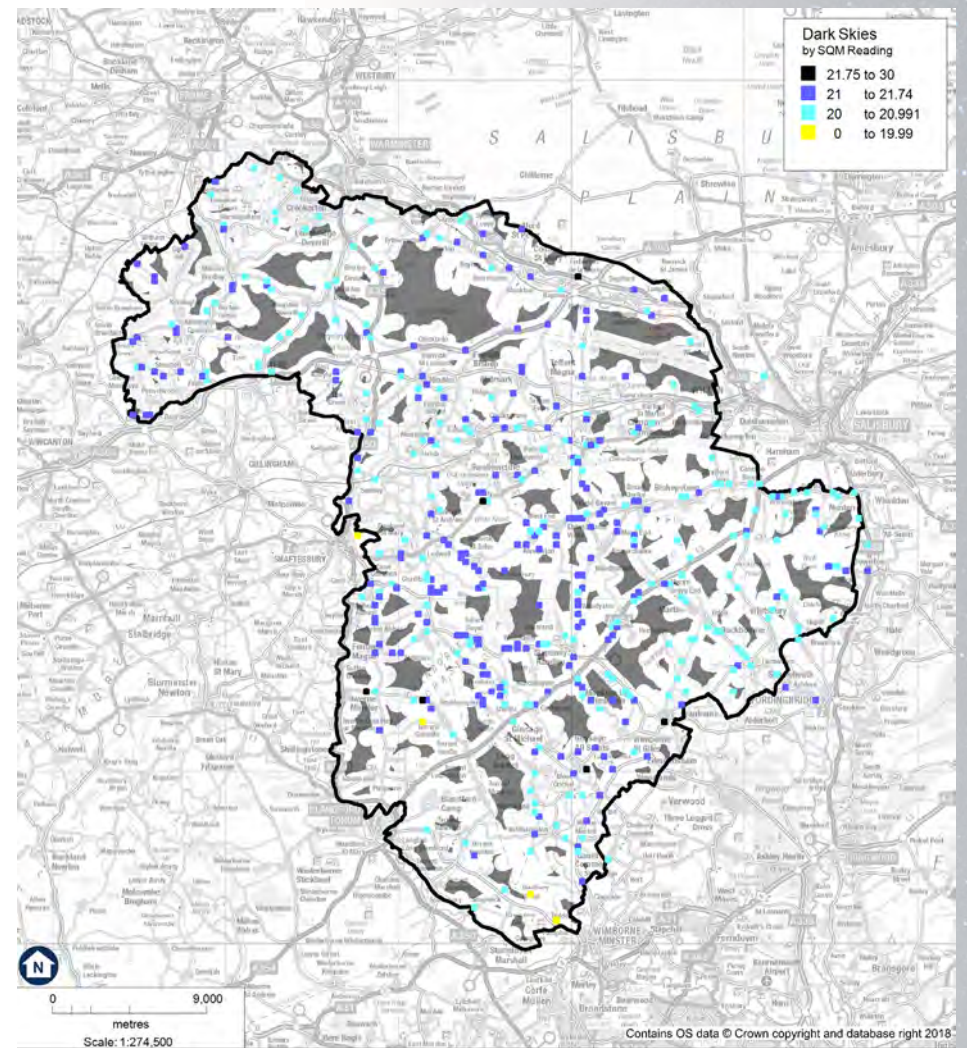
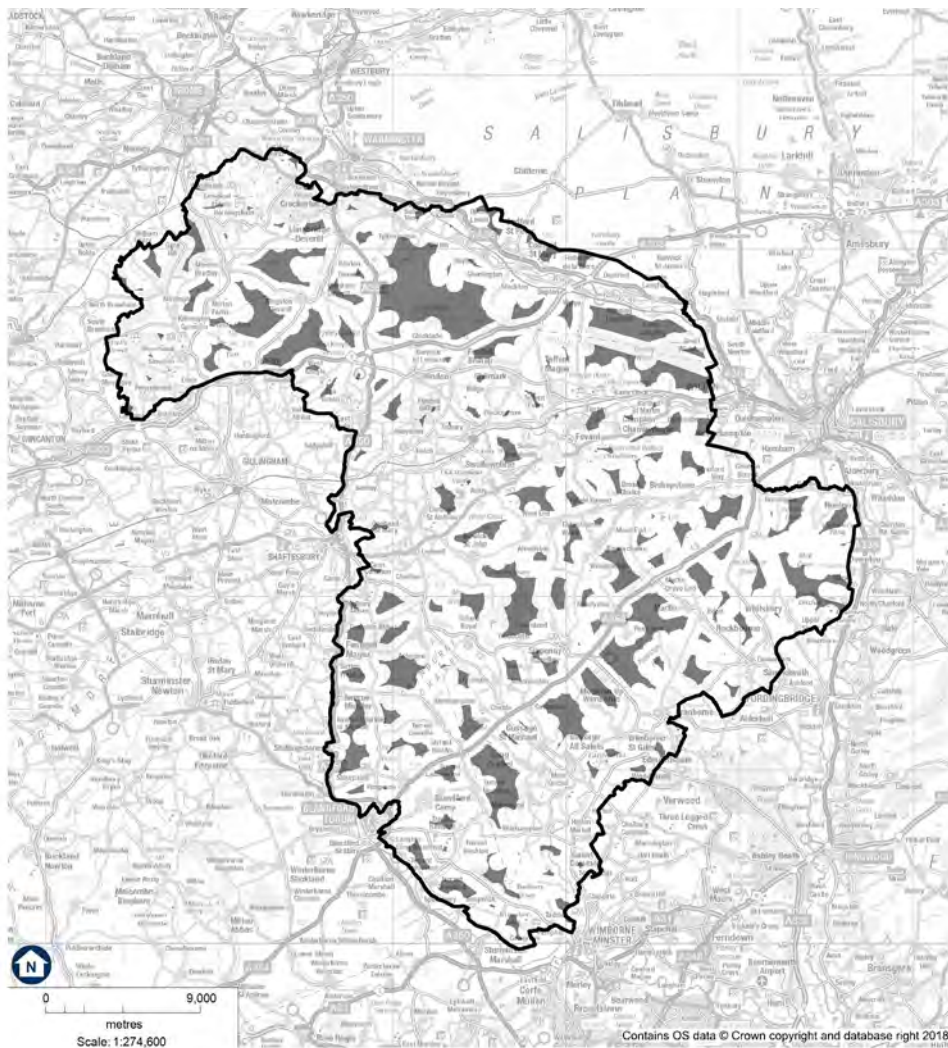
- Indicating that the desk assessment, and our daytime field assessment in the tranquillity study, were reasonably accurate, at least in terms of dark night skies.
- Supporting the linkage between dark night skies and the most tranquil areas of the AONB.

As part of our ongoing work to promote dark skies and their importance to health and wellbeing, we will consider some more analysis of the linkage between tranquillity and dark night skies. This will be useful to us in any future assessments of tranquillity and how it can be improved.

***"The darker the better. I love to see the stars, especially the Milky Way."***

Feedback from Dark Sky Pledge responses.



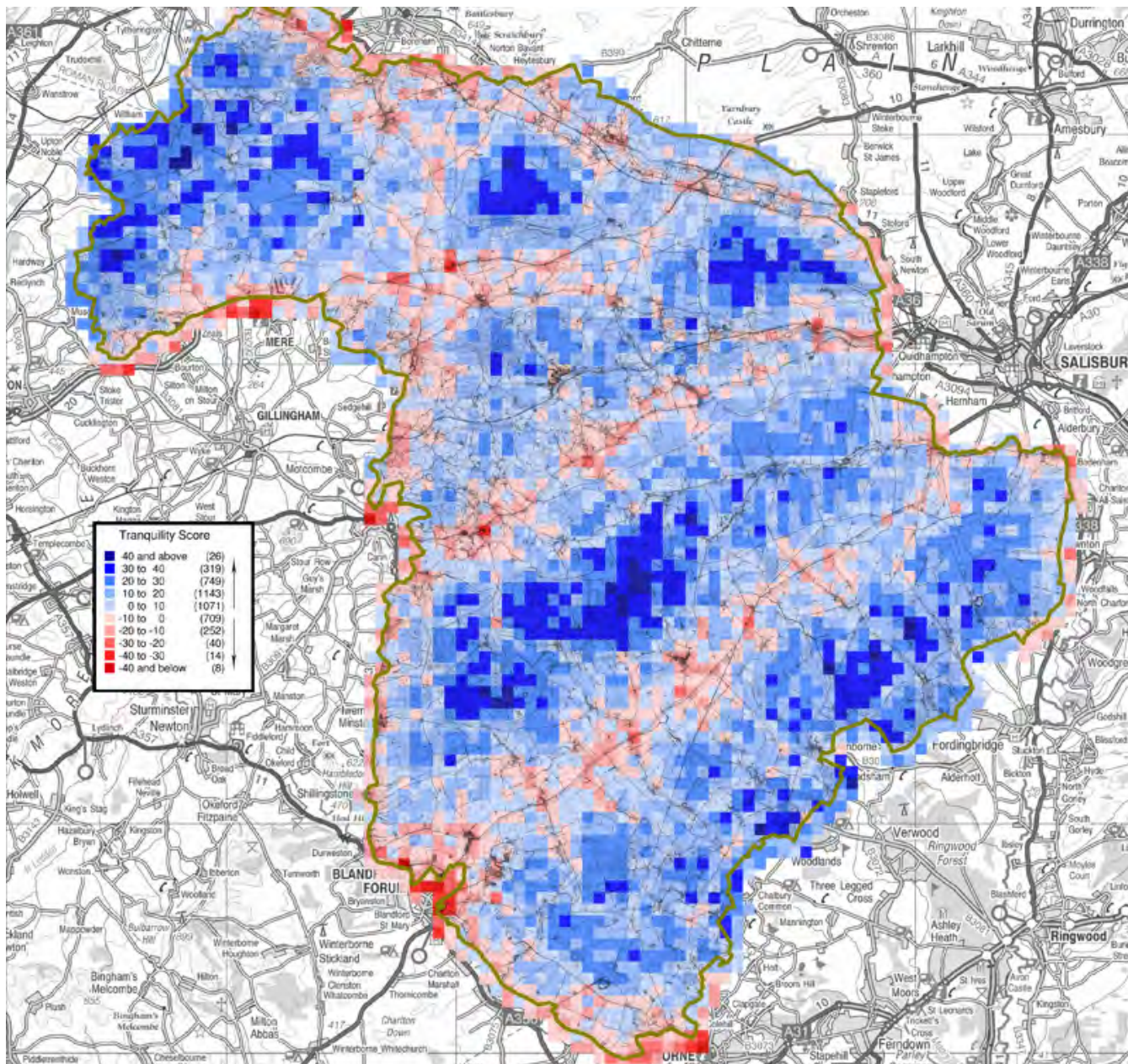


▲ **Fig. C14:** A. Map of the AONB (AONB boundary shown in bold black line). Unshaded areas are  $\leq 0.5$  km from main roads (A, B and C routes\*). Areas shaded dark grey are those  $> 0.5$  km from a main road, and are the relatively uninhabited, less accessible areas of the AONB. B. The same map of the AONB, overlain with the SQM readings. This in particular shows the larger number of ‘silver’ equivalent readings corresponding to the escarpment to the north of the A354.

\*A roads are main routes, of which trunk roads are the top level (the A303 and A36 are trunk roads in the AONB); B roads are also main routes, but with a lower traffic density than A roads; C roads are relatively minor routes with even lower traffic density.







◀ **Fig. C15:** Map of AONB overlain with tranquility scores from the Tranquillity Study. The scoring scale shown in the inset ranges from the most positive score (top, dark blue) to the most negative (bottom, red). The positively scored squares running from SW to NE in the middle and south of the AONB in particular match the darker SQM readings. The red squares largely relate to the main road routes. This is not due to light pollution specifically, but other factors negatively influencing tranquility, such as noise and disturbance.



# SECTION D PROPOSED IDSR BOUNDARY (CORE AND BUFFER ZONES)



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## SECTION D

# PROPOSED IDSR BOUNDARY (CORE AND BUFFER ZONES)

### SECTION SUMMARY

- There is a central area with particularly dark SQM readings
- 50.36% of all readings were at silver tier level, 48.45% were bronze, and 1.19% gold.
- The topography of the AONB assists in reducing light pollution from surrounding urban conurbations. In the interior, many villages lie in valleys, again attenuating light intrusion into the night sky.
- The mean zenith sky quality values for the proposed core and buffer zones are, respectively, very similar at 21.01 and 20.92 mags per arcsec<sup>2</sup>. This reflects the good quality of the night sky across the AONB.
- This overall good quality sets a challenge in deciding on the core and buffer areas of the proposed reserve, to minimise the exclusion of bronze tier level areas.
- We have therefore maximised the area of the core, taking into account SQM readings and planning considerations (i.e. our ability to influence local authority decisions on lighting, and protect the core by mitigating  $\geq 80\%$  of light pollution threats). We recommend the proposed IDSR covers the whole AONB, with a large core equivalent to IDA bronze level.
- The urban conurbations pose the biggest threat to night sky quality in the AONB, especially at its margins.

**Relevant to IDA criteria:** E(B), E(C), M(M)

Our proposal for the IDSR core and buffer areas is based on the following considerations:

- Evidence of dark sky quality, based on our Sky Quality Meter (SQM) readings, the CPRE 'Night Blight' maps from 2016, and photography.
- Topography and character of the AONB.
- Planning considerations.

We have set out the thinking underpinning our proposal with reference to the detailed evaluation of sky quality in Section C. We have also set out the three different options considered, and explained the reasons behind our final proposal.



# Data and analysis informing proposed boundary

## *Sky quality*

Our starting point was the set of ‘Night Blight’ maps produced by the Campaign to Protect Rural England (CPRE; see Fig. C1). A total of 52% and 40% of the AONB falls within the darkest and next darkest of the CPRE’s categories, respectively. The map also indicates the main light pollution threats – mainly external, but with some ‘hotspots’ within our boundary – and the amount to which this influences light pollution, as observed from the satellite imagery.

Details of our methodology for conducting SQM readings, and the results, are set out in Section C. For the purposes of understanding their contribution to the decision on the core and buffer area within the proposed IDSR, the salient points are (some reproduced for ease of reference from Section C):

- 50.36% of the readings correspond to the IDA’s silver tier level, 48.45% to bronze and a smaller number (1.19%) to gold (this is based on readings taken across all monitoring years to date).
- The majority of the silver tier readings (21.00 to 21.74) are concentrated in a fairly central area, focussed on the Ebbles River Valley, the wooded chalk downlands of Cranborne Chase, Fovant Terrace (greensand), and the northern parts of the Southern Downland Belt. The Stour and Avon Tributary Valleys have also yielded some particularly dark readings.
- Readings have been made at accessible locations since 2014, and in different months over the winter period. The results have been very consistent.
- The average zenith sky quality readings for the proposed core and buffer zones are 21.01 and 20.92 mags per arcsec<sup>2</sup>, respectively. As highlighted in Section E, the buffer has about twice as many properties as the core, but is half the area. The similarity in the average result is perhaps therefore surprising. We believe this is probably because the buffer also contains areas of relative remoteness and dark skies, and is not uniformly exposed to light pollution from urban areas outside the AONB boundary.
- The quality of the readings across the area (largely bronze, or higher) has led us to propose that the IDSR and AONB boundaries are coterminous. This set some challenges in deciding on the buffer zone, as we have had to exclude some good quality (bronze level) dark sky areas from the core.

Section C gives more detailed analysis of the night sky quality as evaluated from SQM readings, the changes in night sky quality around settlements and across the AONB boundary from urban conurbations, and an analysis of the positive influence of topography.



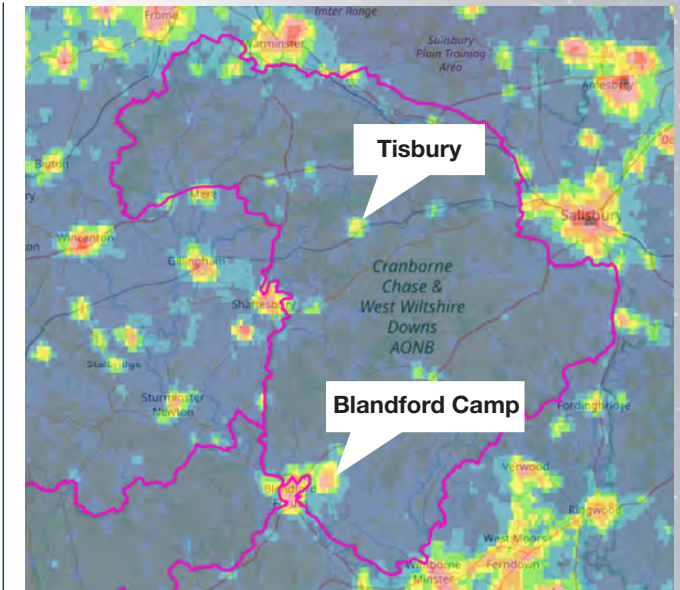
## Topography

Both our own SQM readings and the CPRE 'Night Blight' map show how sky quality is good within the AONB, even in the presence of light pollution from neighbouring urban areas. This is explored in Section C. Similarly, the way many villages nestle within river valleys restricts the impact of any light pollution they produce.

There are two specific locations within the AONB that are relatively bright (Fig. D1). These are Tisbury, which is the AONB's largest village (population 2000), and Blandford Camp (a military base, to the east of Blandford Forum). Both are labelled on Fig. D1.

## Planning considerations

When considering how to draw the core and buffer areas of the proposed reserve, the planning system (Section B and Annex B.1) is both a constraint (but surmountable) and, more importantly, an opportunity. The constraint is that ensuring dark-sky-friendly planning policies and decisions is dependent on our relationship with the planning authorities, and our ability to influence the importance they place on good, dark night skies-compliant lighting. However, the analysis in the Lightscape Management Plan (Section F) presents the extent to which our own focus on lighting in planning policies and applications, and the response of the local planning authorities, has developed positively over the last few years. The opportunity is that, in developing a focus on good lighting in developments with the local planning authorities, we have the opportunity to extend this influence into the parts of these authorities that extend outside our own boundaries.



▲ Fig. D1: CPRE 'Night Blight' map showing Tisbury and Blandford Camp (to left of labels, in each case).

***“As dark skies are getting increasingly rare, I would like to support a dark sky reserve for Cranborne chase.”***

Feedback from Dark Sky Pledge responses.



## Proposed core and buffer areas

We considered three main options.

- A. Coterminous IDSR and AONB boundaries. A large core (655 square kilometres) with the buffer drawn within the boundary sufficient to mitigate  $\geq 80\%$  of light pollution threats into the core.
- B. Reserve boundary within and smaller than AONB boundary. A smaller core area comprising the particularly dark central area of mainly silver level readings, with a buffer zone round it sufficient to mitigate  $\geq 80\%$  of light pollution threats.
- C. Reserve boundary outside AONB boundary. Core is most of AONB area, with buffer zone extending into surrounding rural areas and urban conurbations.

The advantages and disadvantages of each option are set out in Table D1.

	Option	Advantages	Disadvantages
<b>A</b>	IDSR and AONB outer boundary coterminous.	All the $\geq 20^*$ night skies will be included in the reserve. The buffer zone will protect the core from light spill into the AONB from surrounding urban areas, mitigating $\geq 80\%$ of light pollution threats.	Some $\geq 20$ , and even some $\geq 21$ night skies will be excluded from the core (unless the buffer is very narrow), although they will be in the reserve.
<b>B</b>	IDSR boundary within AONB boundary (i.e. does not cover whole AONB but concentrates on darker central area).	The core will focus on the darkest, predominantly silver-level skies.	Some $\geq 21$ night skies close to the AONB boundary will be excluded from the core. Some $\geq 20$ skies will not be in the reserve at all (unless the buffer is made artificially wide to include them).
<b>C</b>	IDSR boundary outside AONB boundary. Core boundary mostly coterminous with AONB.	All the $\geq 20$ night skies will be included in the core. The buffer will comprise the adjacent rural areas and urban conurbations.	The agreement from our partner authorities is for the AONB to apply to be a reserve, with no current agreement to extend beyond our boundary. The AONB currently has less influence on planning decisions taken outside its borders, making the buffer more vulnerable. The area outside the AONB is not a protected area under our management.

▲ **Table D1:** Analysis of different options for core and buffer boundary. (\*Measurements in mags per arcsec<sup>2</sup>)

Working backwards through the three options, Option C has attractions, but would not be achievable for some years, given the endorsement from the AONB Partnership and local planning authorities to apply to be an IDSR relates to the AONB, and not areas outside our boundary. However, as we continue to develop and promote the many benefits of reducing light pollution, we would be interested in working with the LPAs to consider whether it might be possible to extend the IDSR boundary into the rural and urbanised areas outside the AONB. Even if this is not feasible, we will continue to be consulted on planning issues in areas outside our boundary but which nonetheless have an impact on the AONB, so will remain able to influence decisions pertaining to light pollution in the urbanised surrounding areas.



Option B would exclude a large area of  $\geq 20$  skies from the core, including locations that are known to be good for stargazing, so we do not feel it is appropriate. Some  $\geq 21$  skies also lie close to the boundary. It would disappoint the local communities that would be excluded from the IDSR, which have been and continue to be hugely supportive of the importance of preserving our dark skies, and may then feel disengaged from future efforts.

We therefore consider the best option is for the AONB and outer IDSR boundaries to be coterminous (i.e. option A), with the buffer region kept fairly narrow within that boundary.

This overall approach would enable us to:

- Directly engage the whole AONB and its communities in being part of the reserve.
- Continue to influence and respond to planning applications in the area around the AONB, light spillage from which potentially impacts the AONB area, especially the buffer area.
- Encourage parishes that cross or abut the AONB boundary to act as ambassadors to areas outside our boundary. The AONB boundary is based on landscape features, not on administrative boundaries. Some parishes are therefore partly in and partly out of the AONB.
- Over the next five to ten years (representing the cycle of our own Management Plan), work with local planning authorities to extend their dark-sky-friendly lighting policies, and potentially consider extending the buffer boundary outwards in some locations, subject to agreement.
- The proposed boundary of the core itself largely follows the line of the boundary of the AONB, but inset by approximately 2 km. This is a sufficient area to protect the dark core and provide at least an 80% mitigation of light pollution threats. Figure D2 illustrates the proposed boundary, both in general outline, and with examples of the detailed core/buffer boundary, which has been drawn to follow clearly delineated features such as roads, footpaths and field boundaries.

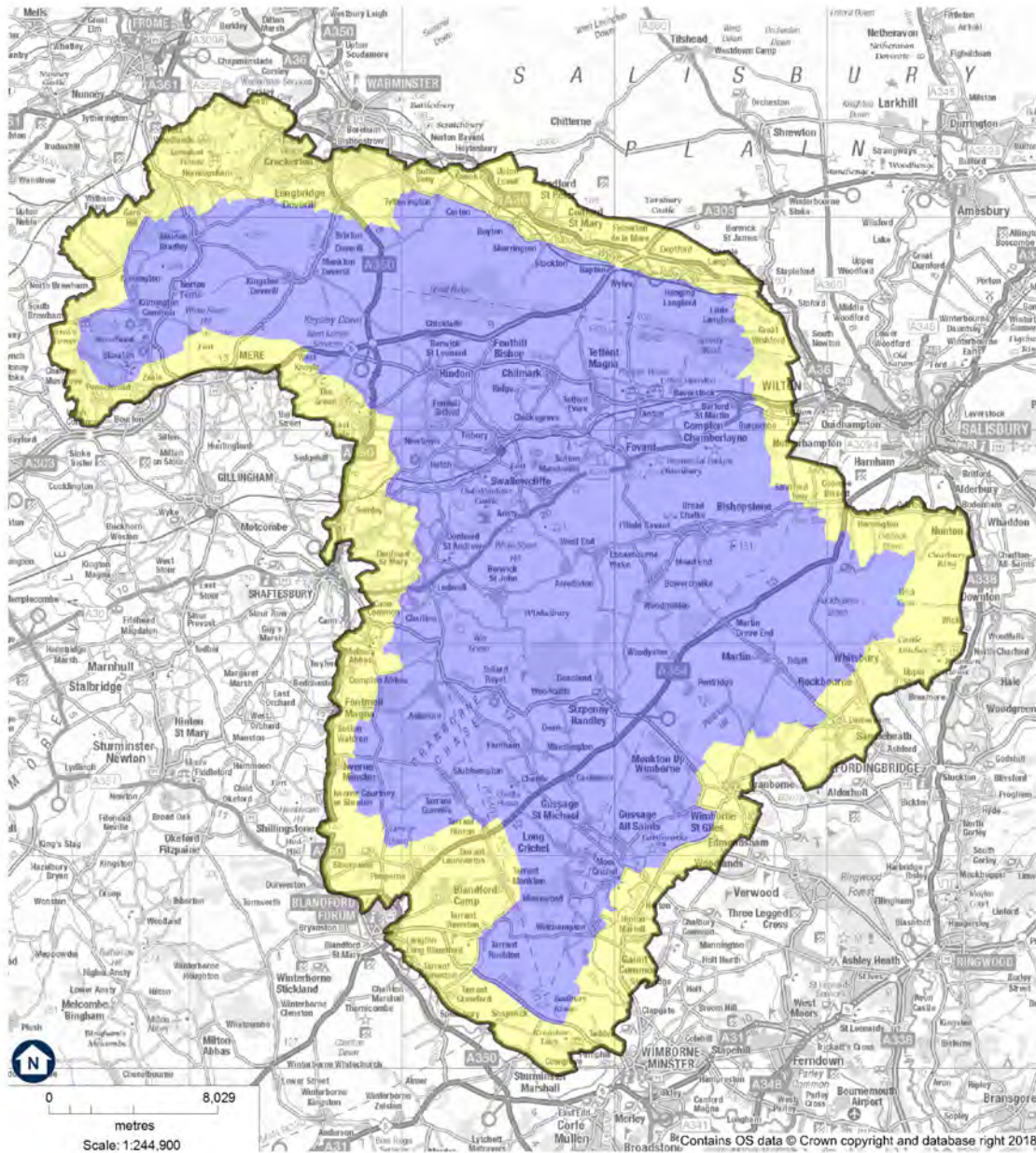
There are exceptions to the proposed 2 km buffer width. These are:

- Where an area inside the boundary has good quality night skies and abuts an area outside the AONB boundary that is not highly urbanised, we have reduced the buffer zone to a width of c. 1 km.
- The buffer has been widened around Blandford Camp. This means the Camp is within the reserve, but recognises its potential impact on light pollution. We will be approaching the Camp to promote more dark-sky-friendly lighting.

The total area of the proposed core is 655 km<sup>2</sup>, and the buffer covers an area of 328 km<sup>2</sup>.

We appreciate that proposing a large core (twice the area of the buffer) is setting ourselves some challenges in achieving the future IDA compliance requirements. We considered this carefully, and wish to pursue this proposal. We feel the initiatives we have established, the work over several years to date, and future plans have put us in a good position to achieve these targets.



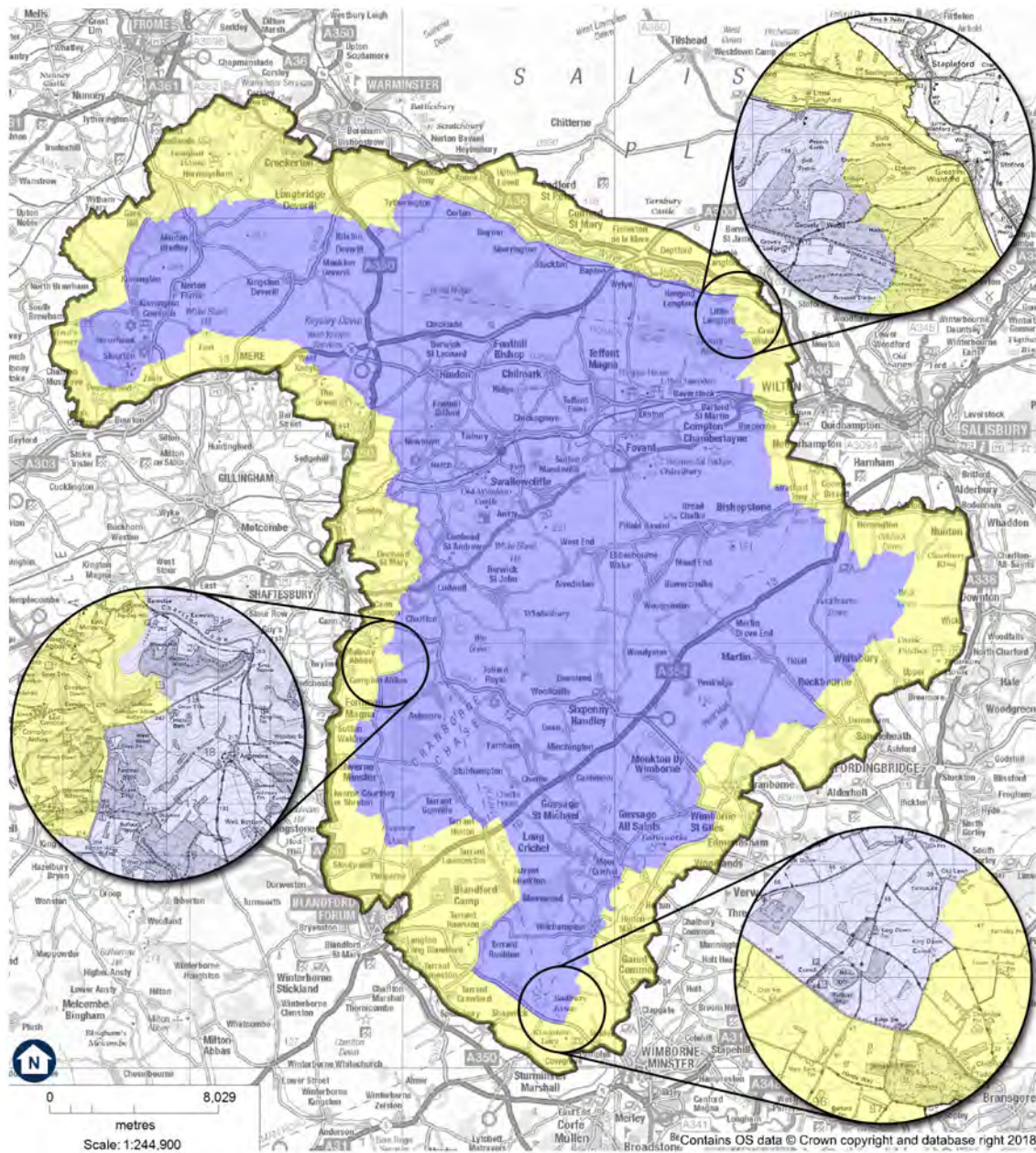


◀ **Fig. D2: a)** Proposed core (shaded blue) and buffer (shaded yellow) zones within the Cranborne Chase AONB. The outer boundary of the proposed IDSR is coterminous with the AONB boundary. The buffer zone is approximately 2 km wide, but is reduced to 1 km wide where it abuts an area outside the AONB boundary that is not highly urbanised. The buffer has also been widened around Blandford Camp (at the southwestern edge of the AONB).

On the next page, Fig. D2b shows examples of the detailed core/buffer boundary, which has been drawn to follow features such as roads, footpaths, or field boundaries.







◀ Fig. D2: b) Examples of the detailed core/buffer boundary, which has been drawn to follow features such as roads, footpaths, or field boundaries.



# SECTION E

# EXTERNAL LIGHTING

# IN THE AONB: AN AUDIT



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# SECTION E

## EXTERNAL LIGHTING IN THE AONB: AN AUDIT

### SECTION SUMMARY

- There is a low level of street lighting across the AONB, with only a few lit areas. Lit areas are concentrated in the urban areas outside the AONB, but between these towns there are dark areas, even outside the AONB boundary.
- A major upgrade of street lighting in Wiltshire will bring AONB street lighting to a compliance level of 77.52% in the core and 54.85% in the buffer (69.68% overall) by the end of 2021. Outside the AONB, this programme will also mitigate sky glow from Salisbury, Mere, Downton, Wilton and Warminster.
- The main tasks (with opportunity for further significant improvement) are to encourage a higher proportion of IDA-compliant domestic lighting.
- Factors mitigating lower domestic compliance include PIR use on some domestic fittings, and consistent evidence lights are turned off late in the evening.
- Approximately half the total domestic-derived lumens impacting the AONB are from urban areas that straddle or lie immediately outside the AONB boundary. Further afield, urban areas such as Bournemouth and Poole add to this source of light pollution.
- The main threats to light pollution affecting the proposed IDSR therefore mainly lie outside its boundary.

**Relevant to IDA criteria:** M(B), M(C)

**Related appendices:** E.1 External lighting audit: methodology

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In this section, we set out an inventory of external lighting across Cranborne Chase AONB. The first part covers street lighting, and is mainly based on information and data obtained from the four County-level Councils. The second section is an analysis of data gathered from a roadside survey sample of external lighting on domestic residences and other property types.

Overall, this section summarises the current situation with regard to public street lighting and signs, and the lumen contribution likely from the present quantities and types of domestic lighting. It provides a baseline against which Section F (Lightscape Management Plan) can be judged once implemented.

The section is necessarily data- and analysis-heavy. In order to assist in navigating through the section, a detailed Section Contents is provided.

**NOTE:** Where Tables in Section E refer to lighting in either the proposed core or buffer zones, cells are shaded **blue** and **beige**, respectively.

# 1. STREET LIGHTING

## 1.1. Summary

The greater part of the Cranborne Chase AONB lies across two counties: Dorset (29%) and Wiltshire (62%). In broad terms, Wiltshire and Dorset comprise the northern and southern parts of the AONB, respectively. All of the local street lighting is operated by these two authorities, with the addition of one small lighting installation within the Wiltshire section of the AONB operated by Highways England. Somerset to the west and Hampshire to the east have no street lighting within the AONB. Overall, the total amount of lighting in the AONB is low due to its very rural nature. There is significant lighting in larger population centres outside the AONB boundary, some of which are very close to its boundary.

### 1.1.2. Data and analysis

Street lighting data was provided by Dorset and Wiltshire Councils in the form of text files from their lighting databases. This was transferred to Excel files for ease of analysis and calculation of lumen footprints. In both authorities, the public lighting record, as well as street lamps, includes lighting associated with traffic signs and bollards. There is also some lighting for a small number of bus shelters and associated signs in Wiltshire. The data for lighting and signs / shelters, has been shown separately in the following analysis.

### 1.1.3. Traffic signs and bollards: national requirements

As many signs in rural areas may be unlit if suitably reflectorised, the overall number of lit signs is low. Whilst traffic bollards may have an omnidirectional light output, this is generally of low power. Most illuminated traffic signs are lit by downlight units, which exhibit good cut-off and emit no direct light skywards, so any potential problems associated with such equipment are minimised both by the small quantities and generally good light control.

Where certain mandatory and/or regulatory signs must be lit, the Traffic Signs Regulations, which apply to all of England and Wales, require the use of 'daylight' lamps (6500 K). This is in order to maintain colour fidelity on sign faces day and night. Originally, this was by means of suitable low-wattage linear fluorescent tubes, but is now via appropriate LED sources.

While such a colour requirement is at odds with IDA values, it is a national requirement under the above-mentioned Regulations. However, there is a minimal amount of such lighting and it generally has good control, so will not be a significant element in the wider lightscape of the AONB. Sign statistics are shown after the street lighting analyses for Dorset and Wiltshire.



## 1.2. County street lighting

The following analysis sets out the status of street lighting at the time of our audit.

It is important to note, however, that a major programme of street light upgrading in Wiltshire was approved by the Council in December 2018 and will start in 2019; it is due to complete in 2021, and is costing over £12 m. **We state this at the outset of this Section as it is now a confirmed programme with a known outcome in terms of compliance with IDA requirements.** Wiltshire street lights within the AONB will have a correlated colour temperature of 2700 K. Outside the AONB, Wiltshire street lights will be 3000 K, thus also mitigating sky glow into the AONB from the Wiltshire urban areas of Mere, Warminster and Salisbury.

The programme, once completed, will bring AONB street lighting to an IDA-compliance level of 77.52% in the core and 54.85% in the buffer (69.68% overall) over the next two years (Table E1). More details are given in Section F (Lightscape Management Plan).

Currently, street lighting is of varying age and type in Wiltshire and Dorset, with significant differences between the two counties. This reflects the different levels of funding and renewal within the authorities over recent years, but this is changing, as outlined in Section F (Lightscape Management Plan).

Figure E1 shows the general locations of street lighting systems within the AONB and major lit areas in the immediate surroundings.

Zone	No. of units	Compliance before upgrade		Compliance after upgrade	
		FG + <3000 K	% Compliance	FG + <3000 K	% Compliance
<b>Core</b>	565	11	1.95	438	77.52%
<b>Buffer</b>	299	32	10.70	164	54.85%
<b>Total</b>	<b>864</b>	<b>43</b>	<b>4.98</b>	<b>602</b>	<b>69.68%</b>

▲ **Table E1:** Effect of Wiltshire street light upgrade on overall AONB street light IDA compliance levels (flat glass [FG] and CCT).

## 1.3. Wiltshire Council street lighting

There are 62 Wiltshire parishes in the AONB, 42 of which (67.7%) are unlit. Within the remaining 20 (32.3%), Wiltshire Council manages:

**566** street lamps

**87** illuminated bollards, signs and bus shelters

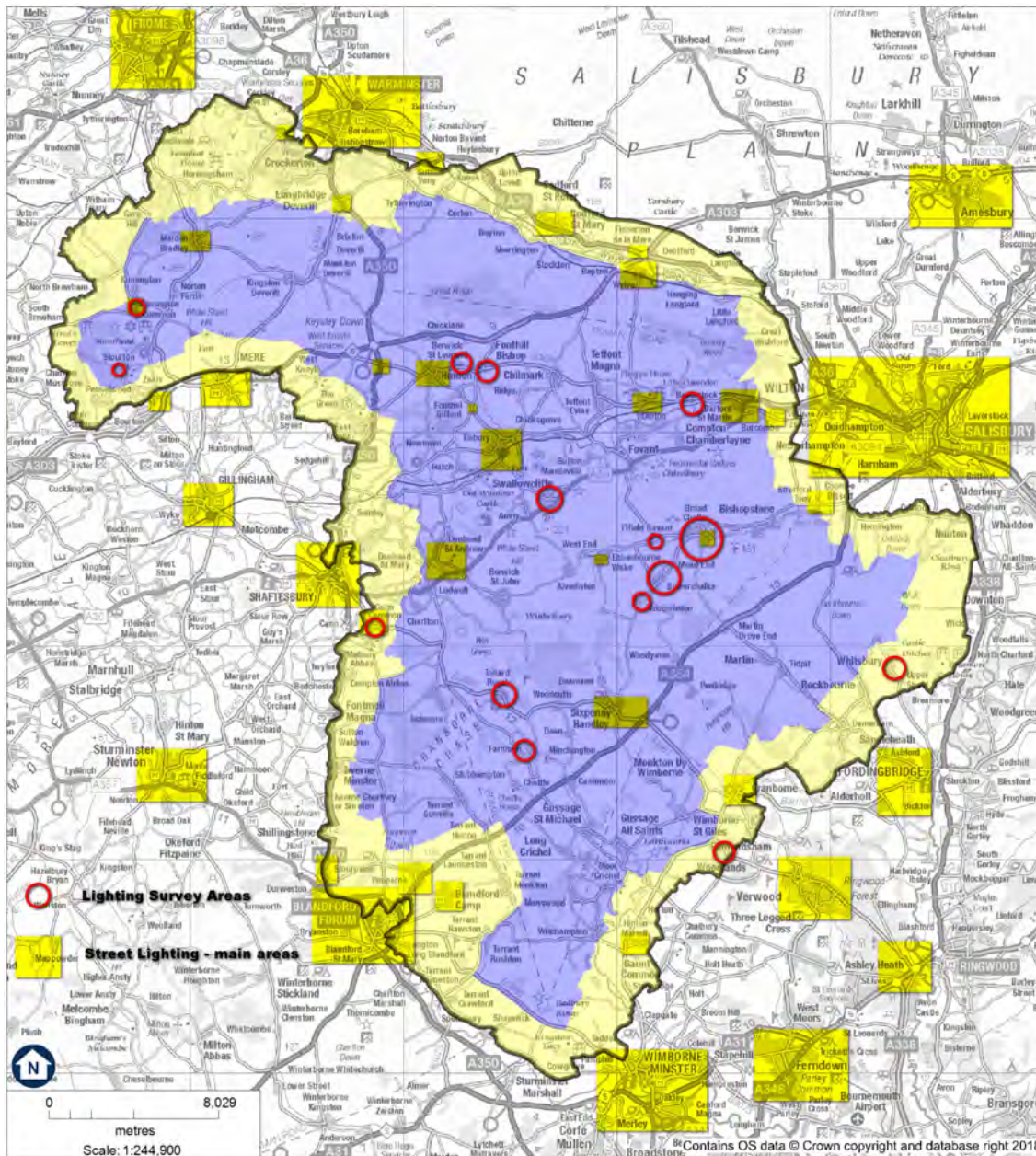
A total of 18 of these 20 parishes have street lighting, 12 being within the proposed core and six in the buffer zone. The split of lighting between the core and buffer is 433 / 133 units (Table E2).

Most lit villages also have some lit signs, with two having lit signs but no street lighting.

The main concentration of lighting, some 43.8%, is within Tisbury, the largest village in Cranborne Chase AONB. Elsewhere, there are relatively small amounts of lighting within the other 17 lit villages (Table E2). (It is worth noting that Tisbury is in the process of preparing a Neighbourhood Plan – see Section B and Appendix B.1 for an explanation of Neighbourhood Plans – and this includes a commitment to reducing light pollution in the interests of dark night skies.)

The 10 m column scheme of 20 LED lights at East Knoyle (Table E2) is positioned at a signal-controlled crossroads on a major road. The scheme, installed in 2014, is required under highways regulations, because it is a strategic heavy goods vehicle (HGV) route. The AONB considers the existing scheme to be a well-designed response to a highways requirement.





◀ **Fig. E1:** Locations of street lighting within and in the vicinity of the AONB. The map also shows the survey villages sampled in the audit of domestic lighting (sub-section 2 of this Section).

*“I live in the AONB, and keep my outside lights switched off unless needed. I love stars and night skies.”*

Feedback from Dark Sky Pledge responses.



Lamp quantities and column heights (m)					
Parish	4 <sup>a</sup>	5–6 <sup>a</sup>	8 <sup>a</sup>	10	Totals
Barford St Martin [C] <sup>b</sup>	0	36	0	0	36
Broad Chalke [C]	0	5	0	0	5
Burcombe Without	0	4	0	0	4
Codford	0	63	0	0	63
Coombe Bissett	0	0	4	0	4
Corsley	0	1	15	0	16
Dinton [C]	0	15	0	0	15
Donhead St Mary [C]	0	39	8	0	47
East Knoyle [C] <sup>c</sup>	0	0	0	20	20
Ebbesborne Wake [C]	0	3	0	0	3
Fonthill Gifford [C]	0	1	0	0	1
Hindon [C]	0	16	2	0	18
Kilminster [C]	0	3	0	0	3
Longbridge Deverill	0	1	0	0	1
Maiden Bradley [C]	0	18	0	0	18
Sutton Veny	0	45	0	0	45
Tisbury [C]	4	236	8	0	248
Wylde [C]	0	19	0	0	19
<b>Core Totals</b>	4	391	18	20	433
<b>Buffer Zone Totals</b>	0	114	19	0	133
<b>Totals</b>	<b>4</b>	<b>505</b>	<b>37</b>	<b>20</b>	<b>566</b>

▲ **Table E2:** Street lighting points in Wiltshire section of the AONB: number and column height.

<sup>a</sup> 4–6 m columns cover normal side road lighting; 8 m columns are used for some busier roads, and sometimes in village centres.

<sup>b</sup> [C] = Core zone

<sup>c</sup> The 10 m scheme at East Knoyle is a flat glass, LED traffic route system at a signal-controlled crossroads on the A350 road, installed in 2014.

### 1.3.1. Current luminaire optics and correlated colour temperature

There are a significant number of low-pressure sodium (SOX) lamps currently in use (215 of the 566 total), many of which are in deep bowl fittings (Fig. E2; Table E3). Although these have poor upward light control, they do comply with colour temperature guidance.



▲ **Fig. E2:** Thorn Beta 5 street light: a typical 35 W SOX fitting mounted on wooden electricity distribution pole. (Philips, GEC and others have fittings in very similar deep-bowl refractor-optics style.)

The most modern of the luminaires are currently the Urbis Teceo main road units installed in 2014, the Urbis Axia and the Philips Luma LED fittings (Table E3). The remainder are older and have generally poorer optics with varying amounts of upward light component. The Thorn Beta 5 (137 lamps of the 566 total), for example, is one of a range of very similar 35 W SOX fittings with deep



bowls and refractor optics, typical of 1970s UK lighting, although it is CCT compliant.

Slightly better are the reflector optic units, but which still have a bowl, such as the Philips SGS 201 (Fig. E3b). These have improved upward light control, but are still not fully shielded. The colour temperature of SOX (1700–1800 K) and SON (2700–2800 K) lamps is a mitigating factor. However, the generally poor light control is currently the most significant issue. Apart from occasional replacements or repairs, this situation will remain in Wiltshire in the short-term, but will of course be resolved by the street lighting upgrade.

Table E3 illustrates some typical Wiltshire street lighting equipment.

Recorded luminaire make / type	W	Type	Qty.
D W WINDSOR UNIDENTIFIED	70	SON-T	3
D W WINDSOR UNIDENTIFIED POST	70	SON-T	2
GEC UNIDENTIFIED POST TOP	35	SOX	58
	50	SON-T	3
GEC UNIDENTIFIED SIDE ENTRY	90	SOX	1
	70	SON-T	1
HOLOPHANE VM VMAX-1	16	LED	5
	32	LED	1
INDUSTRIA LANTERN (DO NOT USE)	50	SON-T	20
	70	SON-T	6
PERIOD STYLE AGE UNKNOWN	70	SON-E	4
PHILIPS MICRO LUMA (12-20LED)	12	LED	1
PHILIPS MINI LUMA (12-40LED)	20	LED	4
PHILIPS SGS 201 (ME TG*)	35	SOX	2
	50	SON-T	66
	70	SON-T	9
PHILIPS SGS 203	50	SON-T	10
	100	SON-T	21
	150	SON-T	24
PHILIPS SGS 252 CONVENTIONAL	50	SON-T	41
	70	SON-T	6
PHILIPS SGS 253 ELECTRONIC	60	CPO	1

Recorded luminaire make / type	W	Type	Qty.
	100	SON-T	1
	150	SON-T	1
PHILIPS SGS 452 LANTERN (ELEC)	50	SON-T	5
PHILIPS UNIDENTIFIED SIDE	35	SOX	4
	50	SON-T	4
PHILIPS WRTL ARC (SMALL)	50	SON-T	2
THORN BETA 2 SOX	35	SOX	1
	55	SOX	1
THORN BETA 5	35	SOX	137
	20	LED	2
THORN BETA 79 QB79 S/E	50	SON-T	17
	70	SON-T	8
THORN GAMMA 6 POST TOP	35	SOX	4
	70	SON-T	4
THORN UNIDENTIFIED LANTERN	35	SOX	1
THORN UNIDENTIFIED TOP ENTRY	35	SOX	6
UNIDENTIFIED LANTERN	50	SON-T	1
UNIDENTIFIED SIDE ENTRY	20	LED	1
	35	SOX	2
URBIS ABBEY	50	SON-T	4
URBIS ALBANY SMALL	45	CPO	33
URBIS AXIA LED	16	LED	2
URBIS KLUX 101 LANTERN	42	PL	1
	70	SON-T	1
URBIS SAPPHIRE 2 LANTERN	70	SON-T	4
URBIS SAPPHIRE 2 ZEBRA LH	60	CPO	2
URBIS TECEO 2 LANTERN (LED)	90	LED	11
	114	LED	9
WATERS TRAD. V1BGO SON	70	SON-T	7
WRTL VECTRA	50	SON-T	1
<b>TOTAL</b>			<b>566</b>

▲ **Table E3:** Current (2019) luminaire types and wattages in the AONB's Wiltshire section.







▲ a. Period style of unknown make (Tisbury).  
70 W SON-E.



▲ b. Philips SGS 201  
70 W SON-T.



▲ c. Philips SGS 252  
Iridium. 70 W SON-T.



▲ d. Waters Traditional V1BGO.  
‘Pot’ optic set within canopy  
70 W SON-T (Urbis Abbey, Metcraft Victoria and  
DW Windsor fittings are all of a similar  
gas-lantern style).



▲ e. Philips SGS 203  
100 W SON-T.



▲ f. Urbis Teceo 2  
56 / 72 LED.

▲ Fig. E3: Current lighting equipment typically found in the Wiltshire section of the AONB.



### 1.3.2. Wiltshire street lighting: current lumen footprint

Initial lamp lumen values are based on Philips' and other manufacturers' data, plus data from the UK Government-funded Carbon Trust (<https://www.carbontrust.com/home/>). As suppliers do not always clearly show lumen figures for LEDs, calculations have been based on a typical LED rated at a nominal 1 W and an output of 110 Lm/W. Tables E4 and E5 show the street lighting lumen calculations for the core and buffer areas of the Wiltshire section of the AONB, respectively.

Lamp	W	Qty.	Lm	Tot. Lm
SOX	35	170	4,550	773,500
	55	2	7,800	15,600
	90	1	14,300	14,300
SON-T	50	127	4,400	558,800
	70	29	6,600	191,400
	100	7	10,700	74,900
	150	20	17,500	350,000
SON-E	70	4	5,600	22,400
CPO	45	33	4,900	161,700
	60	3	7,200	21,600
PL	42	0	3,050	0
LED	12	2	1,320	2,640
	16	9	1,760	15,840
	20	5	2,200	11,000
	32	1	3,520	3,520
	90	11	9,900	108,900
	114	9	12,540	112,860
<b>Totals</b>		<b>433</b>		<b>2,438,960</b>

▲ **Table E4:** Wiltshire street lighting lumen calculation: core.

Lamp	W	Qty.	Lm	Tot. Lm
SOX	35	58	4,550	263,900
	55	0	7,800	0
	90	0	14,300	0
SON-T	50	41	4,400	180,400
	70	10	6,600	66,000
	100	16	10,700	171,200
	150	3	17,500	52,500
SON-E	70	0	5,600	0
CPO	45	0	4,900	0
	60	0	7,200	0
PL	42	1	3,050	3,050
LED	12	0	1,320	0
	16	0	1,760	0
	20	4	2,200	8,800
	32	0	3,520	0
	90	0	9,900	0
	114	0	12,540	0
<b>Totals</b>		<b>133</b>		<b>745,850</b>

▲ **Table E5:** Wiltshire street lighting lumen calculation: buffer zone.

For the AONB total of 566 luminaires, the overall illumination value is:

**3,184,810 Lm**

This gives an average of 5,627 Lm per luminaire



### 1.3.3. Signs, bollards and bus shelter lights in Wiltshire

The 87 signs, bollards and bus shelter lights comprise 13.3% of all lit units in the Wiltshire section of the AONB (core 8.9%, buffer 4.4%). Tables E6 and E7 give some details of types of this lighting, and Tables E8 and E9 give the lumen calculations for the core and buffer, respectively. Within the Wiltshire AONB area, the overall lumen contribution of signs and shelters is very low, at 2.39%. Overall, the gradual change of older 2 x 8 W miniature fluorescent sign lighting units to LED is likely to reduce the overall lumen contribution further.

Sign quantities and heights					
Parish	1	2-3	4	5-6	Totals
Barford St Martin [C]	0	3	0	3	6
Codford	0	8	0	0	8
Corsley	3	4	0	1	8
Dinton [C]	0	0	0	2	2
Donhead St Mary [C]	0	4	0	2	6
East Knoyle [C]	8	0	0	0	8
Hindon [C]	0	5	0	0	5
Longbridge Deverill	2	0	0	0	2
Maiden Bradley [C]	0	0	5	0	5
Odstock	0	3	0	0	3
Steeple Langford	1	1	0	0	2
Sutton Veny	0	6	0	0	6
Tisbury [C]	0	17	1	5	23
Wylde [C]	0	3	0	0	3
Core Totals	8	32	6	12	58
Buffer Zone Totals	6	22	0	1	29
<b>Totals</b>	<b>14</b>	<b>54</b>	<b>6</b>	<b>13</b>	<b>87</b>

[C] = Core

▲ **Table E6:** Wiltshire sign points: number and height.

Recorded fitting make / type	W	Type	Qty.
BERGO FITTING	2 x 8	FL	1
BOLL BASE SIMMONS LV	5	LED	1
BOLLARD - HALDO FLEXIBOLLARD	5	LED	4
BOLLARD-HALDO BASELIGHT C2/BLP	5	LED	2
BOLL-GLASDON LED REBOUND 240V	5	LED	10
TRIPLEX FLEXIBLE BOLLARD	5	LED	2
BUS SHELTER 2D FITTING OE	28	2-D CFL	6
	20	LED	1
REAL TIME PASSENGER INFORMATION	26	CFL	6
PEARCE GOWSHALL LIGHT UNIT	2 x 8	FL	1
	2 x 8	FL	29
SIMMONS LUA SIGN LIGHT	11	CFL	9
SIMMONS LUA SIGN LIGHT 1x11w CF	2 x 8	FL	3
SIMMONS SIGN LIGHT ()	11	CFL	5
SIMMONS LUA LED SIGN LIGHT	3	LED	1
	6	LED	2
	8	LED	2
SMART PULSA WIG WAG	5	LED	2
<b>Total</b>			<b>87</b>

▲ **Table E7:** Wiltshire sign types and wattages.

Type	W	Qty.	Lm	Total. Lm	% of Total
<b>FL</b>	2 x 8	25	864	21,600	
<b>CFL</b>	11	12	600	7,200	
	26	0	1,820	0	
<b>2-D</b>	28	0	2,050	0	<b>78.04%</b>
<b>LED</b>	3	0	330	0	
	5	16	550	8,800	
	6	3	660	1,980	
	8	2	880	1,760	
	20	0	2,200	0	<b>21.96%</b>
<b>Totals</b>		<b>58</b>		<b>41,340</b>	<b>100.00%</b>

▲ **Table E8:** Wiltshire signs and shelter lumen calculation: core. The average contribution per sign is 713 Lm.



Type	W	Qty.	Lm	Total. Lm	% of Total
FL	2 x 8	5	864	4,320	
CFL	11	2	600	1,200	
	26	6	1,820	10,920	
2-D	28	6	2,050	12,300	<b>78.04%</b>
LED	3	1	330	330	
	5	5	550	2,750	
	6	0	660	0	
	8	3	880	2,640	
	20	1	2,200	2,200	<b>21.96%</b>
<b>Totals</b>		<b>29</b>		<b>36,660</b>	<b>100.00%</b>

▲ **Table E9:** Wiltshire signs and shelter lumen calculation: buffer zone. The average contribution per sign is 1,264 Lm.

### 1.3.4. Current total lumen calculations and compliance with IDA criteria in Wiltshire section of the AONB

Finally, our analysis established the total lumen calculation related to street lighting, signs and bollards for the Wiltshire section of the AONB (Table E10), and determined how far this lighting complies with IDA criteria (Tables E11 to E13), in both the core and buffer zones of the proposed IDSR. Table 11 considers compliance with optical requirements, Table 12 with correlated colour temperature requirements, and Table 13 with a combination of both.

Currently, there is a good compliance in respect of light source colour temperature (86.22% overall). However, with relatively few flat glass luminaires (only 11.84% overall), the overall proportion of fully compliant units amounts to some 4% only (1.85% and 11.28% in the proposed core and buffer, respectively). This is the present status, which will be significantly improved to beyond IDA-compliant levels, by the Wiltshire street lighting upgrade (street lights within the AONB will be 2700 K CCT, and will all be converted to flat glass). This will therefore achieve 100% compliance in the Wiltshire section of the AONB, with an overall benefit for cross-AONB compliance (Table E1).

Type	Qty.	Lm	Total Lm	% of total
Core	433		2,438,960	74.75%
Buffer	133		745,850	22.86%
Street lights	566		3,184,810	97.61%
Core	58		41,340	1.27%
Buffer	16		11,240	0.34%
Signs	74		52,580	1.61%
Bus Shelters	13		25,420	0.78%
<b>Totals</b>	<b>653</b>		<b>3,262,810</b>	<b>100.00%</b>

▲ **Table E10:** Current total lumen calculation for Wiltshire section of AONB.

Zone	Flat	Bowl	Total	% FG
Core	41	392	433	9.47%
Buffer	26	107	133	19.55%
<b>Totals</b>	<b>67</b>	<b>499</b>	<b>566</b>	<b>11.84%</b>

▲ **Table E11:** Current compliance with optical (flat-glass; FG) requirements.

Zone	3000 K	> 3000K	Total	% Col. Compl.
Core	360	73	433	83.14%
Buffer	128	5	133	96.24%
<b>Totals</b>	<b>488</b>	<b>78</b>	<b>566</b>	<b>86.22%</b>

▲ **Table E12:** Current compliance with CCT of 3000 K.

Zone	FG + 3000K		Total	% Compliance
Core	8	/	433	1.85%
Buffer	15	/	133	11.28%
<b>Totals</b>	<b>23</b>	<b>/</b>	<b>566</b>	<b>4.06%</b>

▲ **Table E13:** Current flat-glass (FG) + 3000 K compliance, combined.



## 1.4. Dorset Council street lighting

Within eight parishes in Cranborne Chase AONB, Dorset manages:

**286** street lamps

**14** illuminated signs and bollards

### 1.4.1. Luminaire optics and colour temperature

Dorset has operated a comprehensive environmentally-led lighting policy since 2011, together with a renewal programme to install units that are largely dark-skies-compliant. At the time of the original specification, lamps up to 4000 K would have met IDA requirements, and Dorset's street lighting therefore was (and remains) forward-thinking in terms of dark-sky-friendly policies. For example, most fittings are of the fully shielded type (Table E14). However, because many lamps are of 4000 K CCT, Dorset lighting across the AONB (proposed core and buffer zones combined) is now overall only just under 21% compliant in terms of CCT (i.e. only 21% of lamps have a CCT of 3000 K or lower). Nonetheless, currently no old SOX units remain (Table E14). A total of 33.76% are SON-T, 28.25% PLL/PLT, 26.95% now LED and 11.04% CDO/CPO (Fig. E5).

However, it is important to note that Dorset's compliance with flat glass optics is very good, at overall just under 80%, which bodes well for future dark sky discussions with Dorset when considering fitting enhancements or upgrades. The AONB's engagement with Dorset contributed to the 2011 upgrade, and we will continue to work with Dorset to consider future changes to street lighting specifications.

Sixpenny Handley is the only street lighting location in Dorset within the proposed core (Table E15; see Fig. E4 for typical luminaires at this location); all other Dorset street lighting locations lie within the proposed buffer (see Fig. E1). Dorset has almost the same number of street lights in the core (i.e. concentrated in Sixpenny Handley parish) as Wiltshire (132 and 133, respectively), but fewer in the buffer (154 and 433, respectively).



▲ **Fig. E4:** Philips SGS 252 Flat Glass 70 W CDO Luminaires at Sixpenny Handley (typical column and wood-pole mounting). These types of fittings comply with IDA light control requirements. Colour temperature, however, varies with light source, with most in this area being CDO 4000 K.

Recorded luminaire make / type	W	Type	Qty.
CU PHOSCO P567 - FLAT GLASS	70	SON-T	5
CU PHOSCO P567 - POLY BOWL	70	SON-T	38
DW WINDSOR REFRACTOR	70	SON-T	4
METCRAFT VICTORIA	17	LED	0
PHILIPS FGS224 - POLY BOWL	36	PL	7
PHILIPS SGS451 - FLAT GLASS	45	CPO	0
	20	LED	0
PHILIPS SGS252 - FLAT GLASS	70	CDO	77
	32-42	PL	0
PHILIPS SGS252 - SHALLOW BOWL	70	CDO	1
PHILIPS SGS253 - FLAT GLASS	70-100	CDO	29
	90	CPO	0
	70-150	SON-T	36
PHILIPS SGS253 - GLASS BOWL	70-100	CDO	7
PHILIPS BGP615 - FLAT GLASS	9-15	LED	70
THORN BETA79 - POLY BOWL	70	SON-T	4
THORN GAMMA 6 - POLY BOWL	70	SON-T	4
URBIS ABBEY MED. - POLY BOWL	70	SON-T	1
WATERS XP600 VICT'N - POLY BOWL	70	SON-T	3
<b>Total</b>			<b>286</b>

▲ **Table E14:** Current (2019) luminaire types and wattages in the AONB's Dorset section.

Sign quantities and heights <sup>a</sup>					
Parish	4-5	6	8	10	Totals
Sixpenny Handley [C] <sup>b</sup>	70	30	10	22	132
Cranborne	31	15	0	0	46
East Melbury	4	0	0	0	4
Hinton Martell	2	0	0	0	2
Iwerne Minster	5	0	0	0	5
Motcombe	38	2	0	0	40
Pimperne	19	1	3	11	34
Stourpaine	12	11	0	0	23
<b>Core Totals</b>	<b>70</b>	<b>30</b>	<b>10</b>	<b>22</b>	<b>132</b>
<b>Buffer Zone Totals</b>	<b>111</b>	<b>29</b>	<b>3</b>	<b>11</b>	<b>154</b>
<b>Totals</b>	<b>181</b>	<b>59</b>	<b>13</b>	<b>33</b>	<b>286</b>

▲ **Table E15:** Street lighting points in Dorset section of the AONB: number and column height.

<sup>a</sup> General comments concerning mounting heights etc., are the same as for Wiltshire (Table E2).

<sup>b</sup> [C] = core zone





▲ a. **CU Phosco P567 Bowl**  
70w SON-T



▲ b. **Philips SGS 253 FG**  
100 W / 150 WSON-T.  
70 W / 90 W / 100 W CDO CPO



▲ c. **Philips BGP 615**  
Luma Micro LED

▲ **Fig. E5:** Lighting equipment typically found in the Dorset section of the AONB.



### 1.4.2. Dorset street lighting: lumen footprint

The calculations for lamp lumen values are based on the same principles as for Wiltshire (Tables E16 and E17).

Lamp	W	Qty.	Lm	Tot. Lm
<b>SON-T</b>	70	10	6,600	66,000
	100	0	10,700	0
	150	22	17,700	389,400
<b>CDO</b>	70	13	7,800	101,400
	100	23	11,000	253,000
	150	1	15,000	15,000
<b>PLT / L</b>	32	34	2,400	81,600
	36	0	2,900	0
	42	9	3,200	28,800
<b>LED</b>	3	0	330	0
@ Lm / W of 110	5	0	550	0
	9	20	990	19,800
	10	0	1,100	0
	15	0	1,650	0
	16	0	1,760	0
<b>Total</b>		<b>132</b>		<b>955,000</b>

▲ **Table E16:** Dorset street lighting lumen calculation: core (Sixpenny Handley).

The average Dorset value per lighting point is:  
**5041 Lm**

Lamp	W	Qty.	Lm	Tot. Lm
<b>SON-T</b>	70	50	6,600	330,000
	100	8	10,700	85,600
	150	6	17,700	106,200
<b>CDO</b>	70	0	7,800	0
	100	0	11,000	0
	150	0	15,000	0
<b>PLT / L</b>	32	27	2,400	64,800
	36	7	2,900	20,300
	42	7	3,200	22,400
<b>LED</b>	3	0	330	0
@ Lm / W of 110	5	0	550	0
	9	23	990	22,770
	10	5	1,100	5,500
	15	14	1,650	23,100
	16	7	1,760	12,320
<b>Total</b>		<b>154</b>		<b>692,990</b>

▲ **Table E17:** Dorset street lighting lumen calculation: buffer zone.

The total street lighting luminaire value for the Dorset area of the AONB is:  
**1,647,990 Lm**

This gives an average of 5,041 Lm per luminaire (compared to the current Wiltshire value of 5,627 Lm per luminaire).





### 1.4.3. Signs and bollard lights in Dorset

There are a total of 14 signs and bollards in the Dorset section of the AONB (Table E18). The lumen contribution is therefore low and relatively insignificant (Table E19).

Recorded fitting make / type	W	Type	Qty.
SIGNATURE DELTA A SIGNLIGHT	3	LED	4
SIGNATURE DELTA A SIGNLIGHT	(Buffer)	LED	2
SIMMONS GLOBAL BOLLARD	5	LED	8
<b>Total</b>			<b>14</b>

▲ **Table E18:** Dorset sign types and wattages.

Type	W	Qty.	Lm	Total. Lm	% of Total
LED	3	330	4	1,320	
	5	550	8	4,400	89.66%
	3	330	2	60	10.34%
<b>Totals</b>			<b>14</b>	<b>6,380</b>	<b>100.00%</b>

▲ **Table E19:** Lumen contribution of Dorset sign lighting.

### 1.4.4. Total lumen calculations and compliance with IDA criteria in Dorset section of the AONB

In the same way as for the analysis relating to Wiltshire, we then established the total lumen calculation for street lighting, signs and bollards for the Dorset section of the AONB (Table E20), and determined how far it complies with criteria required for IDSRs (Tables E21 to E23).

Over recent years, the Dorset ‘flat-glass’ upgrade policy has improved upward light control significantly. However, the general use of neutral white 4000 K sources means that only a small percentage are fully IDA-compliant. Having said that, no sources are higher than 4000 K. Table E23 (which shows the percentage of overall compliance) also shows how compliant Dorset street lighting would have been when first installed, by calculating percentages on the basis of 4000 K being the compliant CCT level. Although no longer valid when calculating compliance against current IDA criteria, it does illustrate well Dorset’s commitment to good lighting practice.

Type		Qty.	Total Lm	Lm %
<b>Lamps</b>	Core	132	955,000	57.73%
	Buffer	154	692,990	41.89%
Sub-Totals		286	1,647,990	99.61%
<b>Signs</b>	Core	12	5,720	0.35%
	Buffer	2	660	0.04%
Sub-Totals		14	6,380	0.39%
<b>Totals</b>		<b>300</b>	<b>1,654,370</b>	<b>100.00%</b>

▲ **Table E20:** Total lumen calculation for Dorset section of AONB.



Zone	Flat	Bowl	Total	% FG
Core	117	15	132	88.64%
Buffer	103	51	154	66.88%
<b>Total</b>	<b>220</b>	<b>66</b>	<b>286</b>	<b>76.92%</b>

▲ **Table E21:** Compliance with optical (flat-glass; FG) requirements.

Zone	3000 K	> 3000 K	Total	% 3000 K
Core	10	122	132	7.58%
Buffer	49	105	154	31.82%
<b>Total</b>	<b>59</b>	<b>227</b>	<b>286</b>	<b>20.63%</b>

▲ **Table E22:** Compliance with CCT of 3000 K.

Zone	FG + 3000 K		Total	% FG + 3000 K	% FG + 4000 K
Core	3	/	132	1.05%	88.64%
Buffer	5	/	154	1.75%	66.88%
<b>Total</b>	<b>8</b>	<b>/</b>	<b>286</b>	<b>2.80%</b>	<b>76.92%</b>

▲ **Table E23:** Flat-glass (FG) + 3000 K compliance combined (the right-hand column indicates compliance when originally installed, at 4000 K CCT).

## 1.5. Highways England lighting

The other significant road authority in England is Highways England (HE). HE maintains Motorways and Trunk Roads on behalf of the Department of Transport (a Department of the UK Government), including lighting and signage.

There are no Motorways in the vicinity, but two Trunk Roads (the A36 and A303) pass through parts of the AONB. The only HE lighting is in the northern edge of the AONB, on the A36 at its interchange with the A303 at Deptford / Wylde. Complications of local access here required traffic signal control on one junction, with associated lighting and lit signing. This limited lighting system comprises three masts (approximately 25 m high), each carrying four flat-glass CU Phosco P556-type variable optic SON-T luminaires. The lamp wattage is 400 W. These units operate under photocell control.

In addition to the signals, there are also eight lit traffic signs, each having 2 x 8 W fluorescent lamps.

All the lighting and signs are in the proposed buffer zone, just to the north of the boundary with the core.

Type	W	Qty.	Lm	Total Lm	% of Total
Street lights	400	12	55,500	666,000	98.97%
Signs	2 x 8	8	864	6,912	1.03%
<b>Totals</b>		<b>20</b>		<b>672,912</b>	<b>100.00%</b>

▲ **Table E24:** Highways England lighting and signs.

The remaining signs at the Deptford / Wylde interchange, and those on both the A36 and A303 within the AONB, are of the retro-reflective type and have no illumination. This is the norm in rural situations. Only the presence of the signals, in turn requiring road lighting under UK practice, triggered the need for some immediately adjacent signs to be lit.

In terms of IDA requirements, the interchange lighting system is currently fully compliant, with flat-glass full cut-off luminaires and 2800 K SON-T lamps. The sign lighting is, of course, daylight white.

HE has advised that these luminaires are in a renewal programme to be upgraded to LED, but no timescale has yet been set. The proposed luminaire style will be flat-glass, and the AONB will recommend that sources of no more than 3000 K be used. Given the current CCT values in use, there is no reason to suggest this will not be acceptable to HE.



## 1.6. Overall summary of street lighting in the AONB

### 1.6.1. Total lumen calculations in the AONB

Overall, the lumen contribution per light fitting is broadly comparable for the two Counties, despite the differences in equipment age / type and light sources (Table E25). The larger number of light sources in the Wiltshire section of the AONB reflects the larger area of the AONB covered by Wiltshire. This explains why the upgrade of street lights across Wiltshire will have such a significant effect on the AONB's compliance with the IDA guidance in respect of its street lighting stock.

The data for the Wiltshire bus shelter lights appear high in the context of the other data. However, the relatively small numbers of these fittings mean the effect on the AONB's lightscape is fairly insignificant.

The Highways England lamp contribution is relatively high (given the lower number of light sources) because of the use of a mast system with high-wattage lamps.

The Wiltshire bus shelter lights are also of relatively high wattage fluorescent or LED units.

Type	Qty	Total Lm	% of Total
Wiltshire street lighting	566	3,184,810	57.92%
Dorset street lighting	286	1,647,990	29.97%
Highways England (HE) street lighting	12	666,000	12.11%
<b>Lighting Totals</b>	<b>864</b>	<b>5,498,800</b>	<b>100.00%</b>
Wiltshire signs	74	52,580	57.60%
Wiltshire bus shelters	13	25,420	27.84%
Dorset signs	14	6,380	6.99%
HE Signs	8	6,912	7.57%
<b>Sign Totals</b>	<b>109</b>	<b>91,292</b>	<b>100.00%</b>
All street lights	864	5,498,800	98.37%
<b>All signs etc.</b>	<b>109</b>	<b>91,292</b>	<b>1.63%</b>
<b>Totals</b>		<b>5,590,092</b>	<b>100.00%</b>

▲ **Table E25:** Overall lighting summary.

### 1.6.2. Compliance with IDA criteria in the AONB: current and future

There is a relatively limited distribution of street and sign lighting within the AONB's boundary, in both the core and buffer zones. For those that exist, we of course realise current levels of compliance fall below the IDA criteria. This is one reason we 'paused' in our plans to apply for IDSR status, in that we wanted to ensure concrete plans for improving this position had been made. With Wiltshire Council's approval of its street lighting upgrade, we can now be completely certain that street lighting across the AONB is guaranteed a good level of IDA-compliance by the end of 2021, with benefits being seen before that date. Additionally, Dorset Council's environmentally focussed and previously compliant lighting policy and implementation, dating back to 2011, gives us encouragement in considering future discussions, and gives confidence that an even higher street light compliance can be achieved.



Zone	Flat	Bowl	Total	% FG
Core	158	407	565	27.96%
Buffer	141	158	299	47.16%
<b>Total</b>	<b>299</b>	<b>565</b>	<b>864</b>	<b>34.61%</b>

▲ **Table E26:** Current compliance with optical (flat glass; FG) in AONB.

Zone	3000 K	> 3000 K	Tot.	% Col. Compl.
Core	370	195	565	65.49%
Buffer	189	110	299	63.21%
<b>Total</b>	<b>559</b>	<b>305</b>	<b>864</b>	<b>64.70%</b>

▲ **Table E27:** Current compliance with CCT of 3000 K in AONB.

Zone	FG +	3000 K	Tot.	% Col. Compl.
Core	11	/	565	1.95%
Buffer	32	/	299	10.70%
<b>Total</b>	<b>43</b>	<b>/</b>	<b>864</b>	<b>4.98%</b>

▲ **Table E28:** Current flat glass (FG) + 3000 K compliance in AONB combined.

Tables E26 to E28 show that the current situation for street lighting, signs and bollards, and bus shelter lights is that compliance with optical (flat glass) requirements across the AONB is only moderate in the proposed core (27.96%; Table E26). In contrast, overall compliance with the required maximum CCT of 3000 K is much better, in both the core and buffer, with a total compliance of 64.70%, and 65.49% in the core (Table E27).

However, when the flat glass and CCT criteria are combined, the current result is of an overall low compliance in advance of the Wiltshire street lighting upgrade (Table E28). In mitigation of this, the authorities operate sensor switching, dimming, and curfew arrangements – these are covered in Section F: Lightscape Management Plan.

Finally, a significant change will be seen once the Wiltshire flat-glass 2700 K / 3000 K LED upgrade has been completed (Table E29). The proposed core will then meet the IDA’s initial requirements for an IDSR. The longer-term strategy for street lighting in the AONB is therefore focussed on lighting within the Dorset Council area (see Section F: Lightscape Management Plan).

Zone	FG + 3000 K		Units	% Compliance
Core	438	/	565	77.52%
Buffer	164	/	299	54.85%
<b>Total</b>	<b>602</b>	<b>/</b>	<b>864</b>	<b>69.68%</b>

▲ **Table E29:** Preliminary assessment of flat glass (FG) + 3000 K compliance for the entire AONB after Wiltshire street lighting upgrade.

***“Wonderful to have dark skies and no street lights in Chilmark.”***

Feedback from Dark Sky Pledge responses.



## 2. DOMESTIC AND OTHER LIGHTING

The domestic lighting assessment has been based on a sampling procedure, linked to villages representative of each of the AONB's eight landscape character types (Table E30, and see Appendix A.3 for a description of the different landscape character types). It is similar to the process used in other recent IDA applications, such as the Moore's Reserve in South Downs National Park. The data derived from surveys has been used to provide a realistic approximation of lighting throughout the AONB based on habitation data from the 2011 UK National Census.

### 2.1. Survey methodology

The sample villages were visited and the lighting on properties visible from public roads and paths, where accessible, was recorded on a handwritten form. This was subsequently transferred to an Excel file, in a similar format, for analysis purposes. As the lighting data obtained was listed by property, it is not appropriate for this to be published in its raw form (due to national data protection requirements), so it has been appropriately anonymised.

Data was collected for property type, location of fittings, and their intended task. Equipment types and optical information was listed for each property, together with an assessment of the extent of PIR control. Specialist and street lighting was also recorded. In order to give context to the analysis, this sub-section first sets out:

- A sample of the survey sheet format, which is a composite of various locations and light types (Fig. E6).
- Examples of various lighting equipment types and styles and the general categories used (Fig. E7a and b).
- Notes on the survey sheet and processes used (Table E31).

Landscape character type	Village	Buffer or core
<b>Chalk Escarpments</b>	Cann Common	Buffer
	Woodminton	Core
<b>Open Chalk Downland</b>	Edmondsham	Buffer
	Farnham	Core
	Fonthill Bishop	Core
	Berwick St. Leonard (special site – see analysis)	Core
<b>Wooded Chalk Downland</b>	Tollard Royal	Core
<b>Downland Hills</b>	Whitsbury	Buffer
<b>Chalk River Valleys</b>	Bowerchalke	Core
	Broad Chalke	Core
	Fifield Bavant	Core
<b>Greensand Terrace</b>	Kilmington Common	Core
	Swallowcliffe	Core
<b>Greensand Hills</b>	Gasper	Core
<b>Rolling Clay Vales</b>	Baverstock	Core

▲ **Table E30:** Villages sampled in the survey of external lighting, by landscape character type, and whether situated in the proposed buffer or core zone.





			<p><b>Porch downlight</b> Set into ceiling &amp; facing down. Surface mount OK if sides are screened. if sides are screened. Usually fully compliant</p>
			<p><b>Decorative / Heritage</b> Very typical domestic use by doorways and for general lighting along building sides.</p>
			<p><b>Standard / Small Bulkhead</b> Utility fittings for domestic &amp; other lighting. Originally 60w T, now often with CFL lamp. Industrial types too.</p>
			<p><b>Wellglass</b> Typically domestic with 60w T lamp originally, now CFL. Often fixed at corners. Sometimes in larger industrial sizes.</p>
			<p><b>Globe / Modern</b> Usually found domestically. Many types &amp; shapes. Can be fully shielded, but some are made as uplighters.</p>
			<p><b>Square / Rectangular</b> Generally larger sizes than domestic types. More industrial use. Can be fixed vertically or horizontally</p>
			<p><b>Round</b> Some domestic use and other larger types used industrially.</p>
			<p><b>Eyelid</b> Some domestic &amp; larger types industrial. (Eyelid actually does little to control upward light)</p>

			<p><b>LED Strip</b> Various types in use &amp; can be flexible. Often used to highlight linear building features.</p>
			<p><b>Sign Light</b> Often used for pub &amp; shop signs including fascias. Best aimed downwards, but sometimes found.</p>
			<p><b>Large Area Floodlight</b> Typically sports &amp; larger industrial sites; some farms. Many optic &amp; lamp options &amp; usually very high light output.</p>
			<p><b>'500w' TH Floodlight</b> 'Rotweiler' with PIR switch; rarely aimed well. Domestic, industrial &amp; Farm use. Newer LED types equally glaring.</p>
			<p><i>For all floodlights, including large area types, try to judge tilt angle.</i> <i>0° straight down</i> <i>45° - 60° very typical</i> <i>90° horizontal</i> <i>The lower, the better</i></p> <p><b>Medium Floodlight</b> Smaller scaled versions of above,</p>
			<p><b>Small Floodlight</b> Typically on domestic premises. Twin types sometimes used above steps as easier to aim steps as easier to aim than many fittings.</p>
			<p><b>Passive Infra-Red (PIR) detector</b> May be separate or part of combined fitting as seen on some illustrations above.</p>
<p><b>Lamps</b> T - Tungsten TH - Tungsten Halogen CFL - Compact fluorescent</p>	<p><b>Lamps - LED</b> Light-emitting Diode lamps have replaced most older technologies &amp; are generally found in newer fittings.</p>	<p><b>Switching</b> PIR - Heat sensing - detects presence &amp; switches on. Usually with daylight sensor, so lamps only activate after dark.</p>	<p><b>Variations</b> If there are types which do not match examples, chose the best option &amp; add note.</p>

▲ Fig. E7: Examples of light fitting styles in survey.



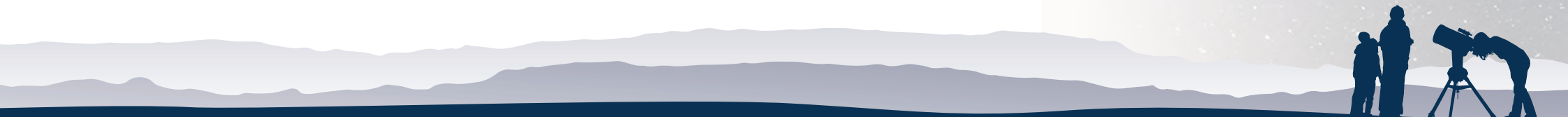
▼ **Table E31:** Notes on completion of survey sheet. The notes below explain the information recorded for each column or set of columns on the sample survey sheet.

Location information	Address recorded for cross-checking purposes, and later removed from file.	
Property type / use	Categories:	Domestic Shop / office Industrial Farm Sports facility School or church Other (identified in manual notes)
Mounting location and type	Categories:	Dwelling / main building Garage Shed / outbuilding Low wall / post or bollard Column Other (identified in manual notes)
Task	Categories:	Access Path Garden / yard Parking area Other (identified in manual notes)
The above columns were recorded using the figure '1' to denote the category, rather than as a numerical value. The remaining columns recorded actual numerical values (either quantities, or angles).		
Lighting equipment: general pattern and typical lamp type	<p>Light sources have been assessed against colour temperature, where possible. In practice, this proved difficult to establish clearly. In general, Tungsten, TH and compact fluorescent lamps in domestic situations have been taken to be 3000 K max. In many cases the lamps were not clearly visible and an informed guess has been made. LEDs have been assessed as all being 4000 K +, as it was not possible to check operation at night.</p> <p>The same applies to Fluorescent and CFL lamps in many bulkhead styles and more commercial / industrial settings. Smaller domestic fittings may have warmer lamps, but most are probably 4000K. Large area fittings are more likely to have HID sources, but in general it was not possible to be clear on the type e.g. SON or metal halide, due to viewing distances and angles.</p> <p>PIR switching on fittings or separate units is identified. Some wall fittings have a miniature detector in the mounting base which was difficult to identify from a distance. These PIRs are therefore probably under-reported. In some cases, with separate PIR units, it was not possible to determine how many adjacent lamps were controlled. However, anecdotal evidence from discussions with local residents during surveys indicated that many people were employing PIR control for all their lighting.</p> <p>Street lights are listed, where found.</p>	





Optical / lumens	<p>The best judgement of the aiming angle of floodlights was made and recorded:  0° = straight down, 90° = pointing horizontally.</p> <p>(In some cases, it was possible to identify double-asymmetric type lights which were pointing up at high angles, when they should have been flat or at a very low tilt. This was possibly due to poor installation or understanding of the correct fitting.)</p> <p>‘Adaptable’ is primarily an assessment of whether a floodlight could be tilted down to 0° and still perform adequately (this was very rarely found to be so in practice, although screening might sometimes be a possibility).</p> <p>The individual ‘Estimated / calc. lumens’ column was not found useful and is dispensed with in the summaries shown later. Overall values were calculated for this in the summary data for each village and landscape type.</p>
Other data	<p>‘No fittings seen’ indicates no lighting clearly visible, with a reasonable view of the premises.</p> <p>‘No views’ indicates inability to make assessment.</p> <p>As noted above, from the site survey, it became obvious that there was often insufficient visibility to identify lamp types, let alone wattages, from many sites viewed. The lumen calculation has therefore been based on a ‘worst case’ scenario, based on general lamp types and wattages / outputs typical for the fitting types. For example, it is standard practice for smaller domestic fittings of various styles to be limited to 60 W Tungsten lamps at a typical value of 800 Lm. This was adapted for changes as appropriate and the values used are shown in the analysis below.</p> <p>‘Fully shielded’ and ‘&lt;500 Lm’ are assessments of IDA compliance with light control.</p> <p>‘Compliant’ includes the above, plus to record where porches and other structures were assessed as providing screening.</p>
Comments	<p>Clarifications, lamp types and other data were added in the Notes section, as needed.</p> <p>If properties were not clearly visible from the road etc., this is noted in the comments section.</p>



## 2.2. Data analysis

Summaries and analyses covering totals for property type, domestic fittings, other (larger) types, special fittings<sup>5</sup> and floodlights, together with PIRs etc., are shown in the following tabular analysis. The summary tables are arranged firstly by landscape character type, and then by the villages surveyed within each landscape character type.

### 2.2.1. Notes on analysis method and presentation

The average number of domestic, general lighting fittings and floodlights has been calculated per property, together with the overall figure for the landscape types containing multiple villages. This has been used in the basic lumen footprint calculations for individual parishes and landscape types. Various values have then been extended to assess the appropriate input for overall AONB totals, based on the 2011 Census.

Table 32 sets out the lumen assessment used for different types of fittings in the lumen calculations.<sup>6</sup> The lumen calculation tables themselves (Table 33) are set out so as to follow the original survey sheet style (Fig. E6), with some small amendments for ease of analysis. Subsequent village lumen totals use basic rounded values. Tables E34 and E35 then summarise the results by parish and village.

In addition to the assessments for numbers of fittings per site, PIR totals are shown and their proportions per fitting and per site calculated. Locations / properties which could not be viewed in the roadside survey were excluded from the primary fittings / site calculations. They were however included in the calculations of the likely lumen footprint for whole villages.

The Berwick St Leonard Fonthill Estate site has been shown separately, due to its atypical situation of being a relatively compact, mixed industrial business, farming and residential location. It is included in the overall totals, however. We thank Fonthill Estate Management for their assistance with the survey and permission to access all areas of the site under their control. This allowed the most accurate count of fitting types and PIR controls (in Berwick St Leonard) of all the survey parishes. The other survey sites, while not surveyed to the same finely detailed level, are a valid representation of domestic lighting across the AONB.

<sup>5</sup> Special fittings were included, as some were seen on initial assessments, but comparatively few were found overall in the subsequent village surveys.

<sup>6</sup> Because some calculations are shown to three decimal places, but the spreadsheet holds certain values in greater accuracy, there are some minor inconsistencies. Nevertheless, the overall figures are comparable.



## Fitting lumen assessments for calculations

Luminaire Type	%	Type / Watts	Lm*		%	Type / Watts	Lm*		%	Type / Watts	Lm*	Lm	Rounded				
Domestic	50%	T 60w	@	800	+	50%	CFL 13w	@	900			=	850	875			
Other (Larger FI & CFL fittings etc.)	100%	2-D Flu. 28w	@	2,050								=	2,050	2,100			
Special (LED strips & signlights etc.)	10%	LED 10w	@	1,100	+	90%	FL sign 20w	@	1,220			=	1,208	1,250			
Large area HID Floods	33%	SON 250w	@	33,000	+	67%	MB 250w	@	20,000			=	24,290	24,500			
Other Floodlights	30%	TH 500w	@	9,500	+	33%	TH 300w	@	5,000	+	37%	TH 150w	@	2,500	=	5,425	5,500

\* Values based on Philips Lighting published data + other manufacturers + UK Govt. sponsored Carbon Trust Data.

▲ **Table E32:** Initial lumen assessments for fitting types.

The following Table (Table E33) provides data from the external lighting audit, conducted as a roadside survey. Sections 2.2.2 to 2.2.4 then provide an analysis of the data. The following notes will be helpful in reading Table E33:

Table E33 is extracted directly from the Excel spreadsheet used to calculate the results.

The survey data is arranged by landscape character type, and then survey villages within each landscape character type. Each subsection includes both the individual results for each survey village within that landscape character type, followed by a summary for the landscape character type as a whole.

Percentages are shown as fractions to 3 decimal places e.g. 0.350 = 35%. This is how the calculations were made by the spreadsheet; Tables in the following sections (2.2.2 to 2.2.4) give figures as percentages.

Results for properties that could not be viewed from the roadside survey are calculated based on the average fittings per property.

As noted earlier, the Berwick St Leonard estate has been reported separately. It lies within the landscape character type of Open Chalk Downland. The access granted by the Fonthill Estate Management meant we were able to survey the site to a particularly high level of accuracy, compared with other survey sites / villages in which we used agreed methodology to infer totals from what could be seen from a roadside survey.



▼ **Table E33:** Summary of parish lighting surveys. The summaries are divided into landscape character type, within each of which data for villages in that landscape character type are shown.

	Property type / use								Mounted on Task				Mounted on				Domestic fittings				Other types		Special		Floodlights			Street Lights			Optical / Im		Other Data			Notes								
	Domestic	Shop / Office	Industrial	Farm	Sports	School / Church	Other (see notes)	Dwelling / Main Structure	Garage	Shed / Building	low wall / post / bollard	Column	Other (see notes)	Porch / door / steps	Pathway	Garden / Yard	Parking area	Other (see notes)	Porch	downlight	Dec. / Heritage	Std. / Small Bulkhead	Wellglass	Gable / Modern	Square / Rectangular	Round	Eyeball	LED strip	Sign illumination	Lamp area fitting	large (500w TH / LED type)	Med.	Small	PIR Detector?	Column Height		Deep Bowl	Shallow Dished	Flat	Tilt angle	Adjustable ?	No fittings seen	No views	Fully shielded ?

1. Chalk Escarpments

<b>Cann Common</b>	Totals	84	0	1	5	0	1	0	77	15	5	1	2	0	30	26	17	28	0	0	39	25	11	4	0	3	4	1	0	2	11	14	26	49	0	0	4	2	15	12	0	0	13
Total sites used	91	91								100				101				79				7		1		140			4		49		/		140		0.350		PIR / fitting				
'No views'	12	Domestic fittings								Other fittings				Special fittings				HID floods		TH / LED floods			Total		49		/		91		0.538		PIR / site										
All locations	103	79	/	91	0.868			7	/	91	0.077		1	/	91	0.011		2	/	91	0.022		51	/	91	0.560		140	/	91	1.538		1.538		Fittings / site overall								
Lumen calcs. for all locations	103	0.868	875			78,240			0.077	2,100		16,638		0.011	1,250		1,415		0.022	24,500		55,462		0.560	5,500		317,489		Total Lumens value			469,244		Cann Common									

<b>Woodminton</b>	Totals	21	0	0	0	0	0	0	21	3	0	1	0	0	11	6	10	2	0	0	16	3	6	5	0	0	0	0	0	0	2	3	4	11	0	0	0	0	0	7	0	0	2
Total sites used	21	21								25				29				30				0		0		9			39		0		11		/		39		0.282		PIR / fitting		
'No views'	7	Domestic fittings								Other fittings				Special fittings				HID floods		TH / LED floods			Total		11		/		21		0.524		PIR / site										
Total locations	28	30	/	21	1.429			0	/	21	0.000		0	/	21	0.000		0	/	21	0.000		9	/	21	0.429		39	/	21	1.857		1.857		Fittings / site overall								
Lumen calcs. for all locations	28	1.429	875			35,000			0.000	2,100		0		0.000	1,250		0		0.000	24,500		0		0.429	5,500		66,000		Total Lumens value			101,000		Woodminton									

Summary

<b>Cann Common</b>	Totals	84	0	1	5	0	1	0	77	15	5	1	2	0	30	26	17	28	0	0	39	25	11	4	0	3	4	1	0	2	11	14	26	49	0	0	4	2	15	12	0	0	13
<b>Woodminton</b>	Totals	21	0	0	0	0	0	0	21	3	0	1	0	0	11	6	10	2	0	0	16	3	6	5	0	0	0	0	0	0	2	3	4	11	0	0	0	0	0	7	0	0	2
<b>1. Chalk Escarpments</b>	Totals	105	0	1	5	0	1	0	98	18	5	2	2	0	41	32	27	30	0	0	55	28	17	9	0	3	4	1	0	2	13	17	30	60	0	0	4	2	15	19	0	0	15
Total sites used	112	112								125				130				109				7		1		60			179		4		60		/		179		0.335		PIR / fitting		
'No views'	19	Domestic fittings								Other fittings				Special fittings				HID floods		TH / LED floods			Total		60		/		112		0.536		PIR / site										
All locations	131	109	/	112	0.973			7	/	112	0.063		1	/	112	0.009		2	/	112	0.018		60	/	112	0.536		179	/	112	1.598		1.598		Fittings / site overall								
Lumen calcs. for all locations	131	0.973	875			111,555			0.063	2,100		17,194		0.009	1,250		1,462		0.018	24,500		57,313		0.536	5,500		385,982		Total Lumens value			573,505		1. Chalk Escarpments									

2. Open Chalk Downlands

<b>Edmonsham</b>	Totals	41	0	0	2	0	0	3	47	3	3	2	1	1	30	15	7	5	0	0	19	19	4	8	0	1	0	0	0	0	6	4	5	19	0	0	0	0	0	1	1	3	0	0	5
Total sites used	46	46								57				57				50				1		0		15			66		0		19		/		66		0.288		PIR / fitting				
'No views'	3	Domestic fittings								Other fittings				Special fittings				HID floods		TH / LED floods			Total		19		/		46		0.413		PIR / site												
Total locations	49	50	/	46	1.087			1	/	46	0.022		0	/	46	0.000		0	/	46	0.000		15	/	46	0.326		66	/	46	1.435		1.435		Fittings / site overall										
Lumen calcs. for all locations	49	1.087	875			46,603			0.022	2,100		2,237		0.000	1,250		0		0.000	24,500		0		0.326	5,500		87,880		Total Lumens value			136,721		Edmonsham											

<b>Farnham</b>	Totals	66	0	0	1	0	1	1	62	8	5	3	1	0	43	15	4	16	1	6	32	14	12	4	0	2	3	0	2	1 <th>2</th> <th>7</th> <th>9</th> <th>23</th> <th>0</th> <th>0</th> <th>0</th> <th>0</th> <th>1</th> <th>15</th> <th>4</th> <th>0</th> <th>0</th> <th>13</th>	2	7	9	23	0	0	0	0	1	15	4	0	0	13
Total sites used	69	69								79				79				68				5		2		18			94		0		23		/		94		0.245		PIR / fitting			
'No views'	4	Domestic fittings								Other fittings				Special fittings				HID floods		TH / LED floods			Total		23		/		69		0.333		PIR / site											
All locations	73	68	/	69	0.986			5	/	69	0.072		2	/	69	0.029		1	/	69	0.014		18	/	69	0.261		94	/	69	1.362		1.362		Fittings / site overall									
Lumen calcs. for all locations	73	0.986	875			62,949			0.072	2,100		11,109		0.029	1,250		2,645		0.014	24,500		25,920		0.261	5,500		104,739		Total Lumens value			207,362		Farnham										

<b>Fonthill Bishop</b>	Totals	37	1	0	0	0	1	4	15	1	1	2	1	0	13	5	8	1	0	3	9	11	7	0	12	0	1	0	0	3	6	10	8	19	0	0	0	0	4	3	0	0	1
Total sites used	43	43								20				27				30				13		0		24			70		0		19		/		70		0.271		PIR / fitting		
'No views'	3	Domestic fittings								Other fittings				Special fittings				HID floods		TH / LED floods			Total		19		/		43		0.442		PIR / site										
All locations	28	30	/	43	0.698			13	/	43	0.302		0	/	43	0.000		3	/	43	0.070		24	/	43	0.558		70	/	43	1.628		1.628		Fittings / site overall								
Lumen calcs. for all locations	28	0.698	875			17,093			0.302	2,100		17,777		0.000	1,250		0		0.070	24,500		47,860		0.558	5,500		85,953		Total Lumens value			168,684		Fonthill Bishop									



	Property type / use								Mounted on Task				Mounted on				Domestic fittings				Other types		Special		Floodlights				Street Lights			Optical / Im		Other Data				Notes					
	Domestic	Shop / Office	Industrial	Farm	Sports	School / Church	Other (see notes)	Dwelling / Main Structure	Garage	Shed / Building	low wall / post / bollard	Column	Other (see notes)	Porch / door / steps	Pathway	Garden / Yard	Parking area	Other (see notes)	Porch downlight	Dec. / Heritage	Std. / Small Bulkhead	Wellglass	Globe / Modern	Square / Rectangular	Round	Eyefit	LED strip	Sign Illumination	Large area fitting	Large (500w / TH / LED type)	Med.	Small	PIR Detector?	Column Height	Deep Bowl	Shallow Dished	Flat		Tilt angle	Adaptable ?	No fittings seen	No views	Fully shielded ?

**Summary**

Edmonsham	Totals	41	0	0	2	0	0	3	47	3	3	2	1	1	30	15	7	5	0	0	19	19	4	8	0	1	0	0	0	0	6	4	5	19	0	0	0	0	0	1	1	3	0	0	5	
Farnham	Totals	66	0	0	1	0	1	1	62	8	5	3	1	0	43	15	4	16	1	6	32	14	12	4	0	2	3	0	2	1	2	7	9	23		0	0	0	1	15	4	0	0	13		
Fonthill Bishop	Totals	37	1	0	0	0	1	4	15	1	1	2	1	0	13	5	8	1	0	3	9	11	7	0	0	12	0	1	0	0	3	6	10	8	19		0	0	0	0	4	3	0	0	1	
2. Open Chalk Downlands	Totals	144	1	0	3	0	2	8	124	12	9	7	3	1	86	35	19	22	1	9	60	44	23	12	12	3	4	0	2	4	14	21	22	61	0	0	0	0	0	2	20	10	0	0	19	
Total sites used		158	158					156				163				148				19		2		4				57			230			0		61				/	230		0.265		PIR / fitting	
'No views'		10	Domestic fittings				Other fittings				Special fittings				HID floods				TH / LED floods				Total		61		/		158		0.386		PIR / site													
All locations		168	148	/	158	0.937	19	/	158	0.120	2	/	158	0.013	4	/	158	0.025	57	/	158	0.361	230	/	158	230		/	158	1.456		1.456		Fittings / site overall												
Lumen calcs. for all locations		168	0.937	875		137,696		0.120	2,100	42,425		0.013	1,250	2,658		0.025	24,500	104,203		0.361	5500	333,342		Total Lumens value				620,324				2. Open Chalk Downland														

**3. Wooded Chalk Downland**

Tollard Royal	Totals	49	0	0	0	0	1	5	63	18	1	1	7	3	33	14	15	27	4	2	60	26	16	0	0	0	1	0	2	0	3	2	21	25		0	0	0	2	0	6	0	0	6		
Total sites used		55	55					93				93				104				1		2		0				26			133			0		25				/	133		0.188		PIR / fitting	
'No views'		6	Domestic fittings				Other fittings				Special fittings				HID floods				TH / LED floods				Total		25		/		55		0.455		PIR / site													
All locations		61	104	/	55	1.891	1	/	55	0.018	2	/	55	0.036	0	/	55	0.000	26	/	55	0.473	133	/	55	133		/	55	2.418		2.418		Fittings / site overall												
Lumen calcs. for all locations		61	1.891	875		100,927		0.018	2,100	2,329		0.036	1,250	2,773		0.000	24,500	0		0.473	5,500	158,600		Total Lumens value				264,629				3. Wooded Chalk D'nland														

**4. Downland Hills**

Whitsbury	Totals	80	0	0	1	0	1	5	65	9	7	1	5	0	44	17	11	14	1	1	37	22	17	3	1	2	0	0	2	2	3	6	11	33		0	0	0	2	0	2	0	0	10		
Total sites used		87	87					87				87				80				3		2		2				20			107			0		33				/	107		0.308		PIR / fitting	
'No views'		2	Domestic fittings				Other fittings				Special fittings				HID floods				TH / LED floods				Total		33		/		87		0.379		PIR / site													
All locations		89	80	/	87	0.920	3	/	87	0.034	2	/	87	0.023	2	/	87	0.023	20	/	87	0.230	107	/	87	107		/	87	1.230		1.230		Fittings / site overall												
Lumen calcs. for all locations		89	0.920	875		71,609		0.034	2,100	6,445		0.023	1,250	2,557		0.023	24,500	50,126		0.230	5,500	112,529		Total Lumens value				243,267				4. Downland Hills														

**5. Chalk River Valleys**

Bowerchalke	Totals	117	0	0	2	0	2	1	92	20	6	1	2	0	61	12	30	14	0	6	58	42	15	6	0	4	2	0	0	0	10	19	7	33		0	0	0	2	11	20	0	0	8		
Total sites used		122	122					121				117				127				6		0		0				36			169			0		33				/	169		0.195		PIR / fitting	
'No views'		20	Domestic fittings				Other fittings				Special fittings				HID floods				TH / LED floods				Total		33		/		122		0.270		PIR / site													
All locations		142	127	/	122	1.041	6	/	122	0.049	0	/	122	0.000	0	/	122	0.000	36	/	122	0.295	169	/	122	169		/	122	1.385		1.385		Fittings / site overall												
Lumen calcs. for all locations		142	1.041	875		129,342		0.049	2,100	14,666		0.000	1,250	0		0.000	24,500	0		0.295	5500	230,459		Total Lumens value				374,467				Bowerchalke														

Broad Chalke	Totals	224	2	8	4	1	1	3	176	29	12	8	13	0	99	44	51	18	2	11	98	54	34	5	5	11	3	1	0	12	22	26	27	57		5	0	0	1	31	18	1	0	30		
Total sites used		243	243					238				214				202				19		1		12				75			309			5		57				/	309		0.184		PIR / fitting	
'No views'		18	Domestic fittings				Other fittings				Special fittings				HID floods				TH / LED floods				Total		57		/		243		0.235		PIR / site													
All locations		261	202	/	243	0.831	19	/	243	0.078	1	/	243	0.004	12	/	243	0.049	75	/	243	0.309	309	/	243	309		/	243	1.272		1.272		Fittings / site overall												
Lumen calcs. for all locations		261	0.831	875		189,843		0.078	2,100	42,856		0.004	1,250	1,343		0.049	24,500	315,778		0.309	5,500	443,056		Total Lumens value				992,874				Broad Chalke														

Fifield Bavant	Totals	13	0	0	1	0	1	0	11	0	0	0	0	0	5	1	3	0	0	1	6	0	0	0	0	0	0	0	0	0	4	2	7	12		0	0	0	0	1	0	0	0	2		
Total sites used		15	15					11				9				7				0		0		0				13			20			0		12				/	20		0.600		PIR / fitting	
'No views'		0	Domestic fittings				Other fittings				Special fittings				HID floods				TH / LED floods				Total		12		/		15		0.800		PIR / site													
All locations		15	7	/	15	0.467	0	/	15	0.000	0	/	15	0.000	0	/	15	0.000	13	/	15	0.867	20	/	15	20		/	15	1.333		1.333		Fittings / site overall												
Lumen calcs. for all locations		15	0.467	875		6,125		0.000	2,100	0		0.000	1,250	0		0.000	24,500	0		0.867	5,500	71,500		Total Lumens value				77,625				Fifield Bavant														



	Property type / use								Mounted on Task				Mounted on				Domestic fittings				Other types		Special		Floodlights			Street Lights			Optical / Im		Other Data				Notes						
	Domestic	Shop / Office	Industrial	Farm	Spots	School / Church	Other (see notes)	Dwelling / Main Structure	Garage	Shed / Building	low wall / post / bollard	Column	Other (see notes)	Porch / door / steps	Pathway	Garden / Yard	Parking area	Other (see notes)	Porch downlight	Dec. / Heritage	Std. / Small Bulkhead	Wellglass	Globe / Modern	Square / Rectangular	Round	Eyelid	LED strip	Sign Illumination	Large area fitting	large (500w TH / LED type)	Med.	Small	PIR Detector?	Column Height	Deep Bowl	Shallow Dished		Fat	Tilt angle	Adaptable ?	No fittings seen	No views	Fully shielded ?

**Summary**

Bowerchalke	Totals	117	0	0	2	0	2	1	92	20	6	1	2	0	61	12	30	14	0	6	58	42	15	6	0	4	2	0	0	0	10	19	7	33		0	0	0		2	11	20	0	0	8	
Broad Chalke	Totals	224	2	8	4	1	1	3	176	29	12	8	13	0	99	44	51	18	2	11	98	54	34	5	5	11	3	1	0	12	22	26	27	57		5	0	0		1	31	18	1	0	30	
Fifield Bavant	Totals	13	0	0	1	0	1	0	11	0	0	0	0	0	5	1	3	0	0	1	6	0	0	0	0	0	0	0	0	4	2	7	12		0	0	0		0	1	0	0	0	2		
5. Chalk River Valleys		354	2	8	7	1	4	4	279	49	18	9	15	0	165	57	84	32	2	18	162	96	49	11	5	15	5	1	0	12	36	47	41	102		5	0	0		3	43	38	1	0	40	
Total sites used		380	380					370				340				336				25		1		12			124			498			102		/		498		0.205		PIR / fitting					
'No views'		38	Domestic fittings				Other fittings				Special fittings				HID floods				TH / LED floods			Total		102		/		380		0.268		PIR / site														
All locations		418	336	/	380	0.884	25	/	380	0.066	1	/	380	0.003	12	/	380	0.032	124	/	380	0.326	498	/	380	1.311	1.311	Fittings / site overall																		
Lumen calcs. for all locations		418	0.884	875	323,400	0.066	2,100	57,750	0.003	1,250	1,375	0.032	24,500	323,400	0.326	5,500	750,200	Total Lumens value		1,456,125		5. Chalk River Valleys																								

**6. Greensand Terrace**

<b>Kilmington Common</b>	Totals	35	0	0	0	0	1	35	5	2	1	0	0	16	6	10	11	0	0	17	8	1	8	0	0	1	0	0	0	5	2	13	13		0	0	0		1	3	6	0	0	9	
Total sites used		36	36					43				43				34				1		0		20			55			13		/		55		0.236		PIR / fitting							
'No views'		6	Domestic fittings				Other fittings				Special fittings				HID floods				TH / LED floods			Total		13		/		36		0.361		PIR / site													
All locations		42	34	/	36	0.944	1	/	36	0.028	0	/	36	0.000	0	/	36	0.000	20	/	36	0.556	55	/	36	0.556	55	/	36	0.556	128,333	Total Lumens value		165,492		Kilmington Common									
Lumen calcs. for all locations		42	0.944	875	34,708	0.028	2,100	2,450	0.000	1,250	0	0.000	24,500	0	0.556	5,500	128,333	Total Lumens value		165,492		Kilmington Common																							

<b>Swallowcliffe</b>	Totals	75	2	0	1	0	1	3	56	11	5	3	2	1	32	16	24	11	0	1	70	15	7	7	4	0	0	0	2	0	8	16	3	21		0	0	0		0	16	8	4	0	15	
Total sites used		82	82					78				83				100				4		2		27			133			0		21		/		133		0.158		PIR / fitting						
'No views'		8	Domestic fittings				Other fittings				Special fittings				HID floods				TH / LED floods			Total		21		/		82		0.256		PIR / site														
All locations		90	100	/	82	1.220	4	/	82	0.049	2	/	82	0.024	0	/	82	0.000	27	/	82	0.329	133	/	82	1.622	1.622	Fittings / site overall																		
Lumen calcs. for all locations		90	1.220	875	96,037	0.049	2,100	9,220	0.024	1,250	2,744	0.000	24,500	0	0.329	5,500	162,988	Total Lumens value		270,988		Swallowcliffe																								

**Summary**

Kilmington Common	Totals	35	0	0	0	0	1	35	5	2	1	0	0	16	6	10	11	0	0	17	8	1	8	0	0	1	0	0	0	5	2	13	13		0	0	0		1	3	6	0	0	9		
Swallowcliffe	Totals	75	2	0	1	0	1	3	56	11	5	3	2	1	32	16	24	11	0	1	70	15	7	7	4	0	0	0	2	0	8	16	3	21		0	0	0		0	16	8	4	0	15	
6. Greensand Terrace	Totals	110	2	0	1	0	1	4	91	16	7	4	2	1	48	22	34	22	0	1	87	23	8	15	4	0	1	0	2	0	13	18	16	34		0	0	0		1	19	14	4	0	24	
Total sites used		118	118					121				126				134				5		2		47			188			0		34		/		188		0.181		PIR / fitting						
'No views'		14	Domestic fittings				Other fittings				Special fittings				HID floods				TH / LED floods			Total		34		/		118		0.288		PIR / site														
All locations		132	134	/	118	1.136	5	/	118	0.042	2	/	118	0.017	0	/	118	0.000	47	/	118	0.398	188	/	118	1.593	1.593	Fittings / site overall																		
Lumen calcs. for all locations		132	1.136	875	131,161	0.042	2,100	11,746	0.017	1,250	2,797	0.000	24,500	0	0.398	5,500	289,169	Total Lumens value		434,873		6. Greensand Terrace																								

**7. Greensand Hills**

<b>Gaspar</b>	Totals	17	0	0	0	0	0	14	2	0	1	0	0	12	2	2	2	1	0	7	9	0	4	0	3	0	0	0	0	1	1	0	4		0	0	0		0	3	4	4	0	6	
Total sites used		17	17					17				19				20				3		0		2			25			0		4		/		25		0.160		PIR / fitting					
'No views'		4	Domestic fittings				Other fittings				Special fittings				HID floods				TH / LED floods			Total		4		/		17		0.235		PIR / site													
All locations		21	20	/	17	1.176	3	/	17	0.176	0	/	17	0.000	0	/	17	0.000	2	/	17	0.118	25	/	17	1.471	1.471	Fittings / site overall																	
Lumen calcs. for all locations		21	1.176	875	21,618	0.176	2,100	7,782	0.000	1,250	0	0.000	24,500	0	0.118	5,500	13,588	Total Lumens value		42,968		7. Greensand Hills																							





▼ **Table E34:** Overall summary of parish lighting surveys.

	Sub Totals	Property type / use							Mounted on Task					Mounted on				Domestic fittings				Other types			Special		Floodlights				Street Lights			Optical / Im		Other Data				Notes						
		Domestic	Shop / Office	Industrial	Farm	Sports	School / Church	Other (see notes)	Dwelling / Main Structure	Garage	Shed / Building	low wall / post / bollard	Column	Other (see notes)	Porch / door / steps	Pathway	Garden / Yard	Parking area	Other (see notes)	Porch downlight	Dec. / Heritage	Std. / Small Bulkhead	Wellglass	Globe / Modern	Square / Rectangular	Round	Eyeid	LED strip	Sign illumination	Large area fitting	large (500w TH LED type)	Med.	Small	PIR Detector?	Column Height	Deep Bowl	Shallow Dished	Flat	Tilt angle		Adaptable ?	No fittings seen	No views	Fully shielded ?	< 500 Lm ?	Compliant?
<b>All Locations</b>		884	29	23	29	1	12	27	759	127	65	26	51	5	460	184	218	160	11	32	479	279	132	62	24	27	15	2	8	75	126	144	162	388	0	5	0	4	0	13	104	98	14	0	156	
	Totals	1,005							1,033					1,033				984				66			10		75				432			1,567			1,005		+				98	=	1,103	Total Sites

▼ **Table E35:** Landscape and lighting fitting types.

Village	L-Type	Properties & details													Light fittings								PIRs per		Street		Landscape																							
		Property type / use							Mounted on						Task				Domestic fittings				Other types			Special	Floodlights				VII.	L-T	Lights		Type															
<b>Cann Common</b>	1	84	0	1	5	0	1	0	77	15	5	1	2	0	30	26	17	28	0	0	39	25	11	4	0	3	4	1	0	2	11	14	26	49		0	0	4	2	15	12	0	0	13	1)					
<b>Woodminton</b>	1	21	0	0	0	0	0	0	21	3	0	1	0	0	11	6	10	2	0	0	16	3	6	5	0	0	0	0	0	0	2	3	4	11	60	0	0	0	0	0	7	0	0	2	1) Chalk Escarpments					
<b>Edmondsham</b>	2	41	0	0	2	0	0	3	47	3	3	2	1	1	30	15	7	5	0	0	19	19	4	8	0	1	0	0	0	6	4	5	19	0	0	0	0	1	1	3	0	0	5	2)						
<b>Farnham</b>	2	66	0	0	1	0	1	1	62	8	5	3	1	0	43	15	4	16	1	6	32	14	12	4	0	2	3	0	2	1	2	7	9	23		0	0	0	1	15	4	0	0	13	2)					
<b>Fonhill Bishop</b>	2	37	1	0	0	0	1	4	15	1	1	2	1	0	13	5	8	1	0	3	9	11	7	0	12	0	1	0	0	3	6	10	8	19	61	0	0	0	0	4	3	0	0	1	2) Open Chalk Downland					
<b>Tollard Royal</b>	3	49	0	0	0	0	1	5	63	18	1	1	7	3	33	14	15	27	4	2	60	26	16	0	0	0	1	0	2	0	3	2	21	25	25	0	0	0	2	0	6	0	0	6	3) Wooded Chalk Downland					
<b>Whitsbury</b>	4	80	0	0	1	0	1	5	65	9	7	1	5	0	44	17	11	14	1	1	37	22	17	3	1	2	0	0	2	2	3	6	11	33	33	0	0	0	2	0	2	0	0	10	4) Downland Hills					
<b>Bowerchalke</b>	5	117	0	0	2	0	2	1	92	20	6	1	2	0	61	12	30	14	0	6	58	42	15	6	0	4	2	0	0	10	19	7	33		0	0	0	2	11	20	0	0	8	5)						
<b>Broad Chalke</b>	5	224	2	8	4	1	1	3	176	29	12	8	13	0	99	44	51	18	2	11	98	54	34	5	5	11	3	1	0	12	22	26	27	57		5	0	0	1	31	18	1	0	30	5)					
<b>Fifield Bavant</b>	5	13	0	0	1	0	1	0	11	0	0	0	0	0	5	1	3	0	0	1	6	0	0	0	0	0	0	0	0	4	2	7	12	102	0	0	0	0	1	0	0	0	2	5) Chalk River Valleys						
<b>Kilmington Common</b>	6	35	0	0	0	0	0	1	35	5	2	1	0	0	16	6	10	11	0	0	17	8	1	8	0	0	1	0	0	5	2	13	13		0	0	0	1	3	6	0	0	9	6)						
<b>Swallowcliffe</b>	6	75	2	0	1	0	1	3	56	11	5	3	2	1	32	16	24	11	0	1	70	15	7	7	4	0	0	0	2	0	8	16	3	21	34	0	0	0	0	16	8	4	0	15	6) Greensand Hills					
<b>Gaspar</b>	7	17	0	0	0	0	0	0	14	2	0	1	0	0	12	2	2	2	1	0	7	9	0	4	0	3	0	0	0	1	1	0	4	4	0	0	0	0	3	4	4	0	6	7) Greensand Terrace						
<b>Baverstock</b>	8	11	1	0	2	0	1	1	15	2	5	1	0	0	10	4	4	6	0	0	8	5	1	7	0	0	0	0	0	8	1	3	4	4	0	0	0	1	0	3	0	0	7	8) Rolling Clay Vales						
<b>Berwick St Leonard</b>	(2)	14	23	14	10	0	1	0	10	1	13	0	17	0	21	1	22	5	2	1	3	26	1	1	2	1	0	0	0	55	35	31	18	65	65	0	0	0	0	4	2	5	0	29	(2) Open Chalk Downland					
<b>All Landscape Types (Sub total)</b>		884	29	23	29	1	12	27	759	127	65	26	51	5	460	184	218	160	11	32	479	279	132	62	24	27	15	2	8	75	126	144	162	388	388	5	0	4	13	104	98	14	0	156						
<b>Totals</b>		1,005							1,033						1,033				984				66			10		75				432			1,567			9		1,005 + 98 = 1,103										Total Sites





## 2.2.2. Summary findings of external lighting audit

Tables E33 to E35 provide a detailed presentation of the data collected in the roadside surveys. The following tables and text provide an analysis of different elements extracted from that data.

**Types of property:** A total of 1005 locations were viewed in the 15 parishes surveyed (Table E36). This number was used for handling the statistical data on lamp and PIR frequencies etc. Expected values for properties identified but not viewed due to inaccessibility (the 'no views') were calculated based on the data from viewed properties, and added to the calculations to obtain values for the villages as a whole.

The overwhelming number of sites are domestic (Table E36).

Property Type / Use	Quantity	No View	Total	%
Domestic	884	86	970	87.96%
Shop / Office	29	0	29	2.89%
Industrial	23	1	24	2.29%
Farm	29	11	40	2.89%
Sports	1	0	1	0.10%
School / Church	12	0	12	1.19%
Other (Pub, Hotel, Hall etc.)	27	0	27	2.69%
<b>Total</b>	<b>1,005</b>	<b>98</b>	<b>1,103</b>	<b>100.00%</b>

▲ **Table E36:** Surveyed sites - property types (%).

Mountng Location	Quantity	%
Dwelling / Main Structure	759	73.48%
Garage	127	12.29%
Shed / Building	65	6.29%
Low wall / post / bollard	26	2.52%
Column	51	4.94%
Other (see notes)	5	0.48%
<b>Total</b>	<b>1,033</b>	<b>100.00%</b>

▲ **Table E37:** Mounting of fitting.

Task / Lit Area	Qty.	%
Porch / door / steps	460	44.53%
Pathway	184	17.81%
Garden / Yard	218	21.10%
Parking area	160	15.49%
Other (see notes)	11	1.06%
<b>Total</b>	<b>1,033</b>	<b>100.00%</b>

▲ **Table E38:** Lighting task.

**Mounting locations:** A total of 92% of domestic fittings were mounted on main structures (either the dwelling, garage or shed / outbuilding); this is what would be expected (Table E37). It is perhaps useful to note that a significant amount of light from fittings mounted in this way is shielded to a smaller or larger extent.

**Lighting task:** Over 62% of fittings were associated with porches, doorways and property access (Table E38). This seems to sit well with the use of and potential extension of PIR controls, discussed later in sub-section 2.2.3.

A total of 36% of fittings are linked to gardens, yards and parking areas, so may be more associated with the domestic floodlighting units, providing a security function.

**Lumen calculations by category of fitting:** The lumen calculation is based on the actual fitting numbers extracted from Table E35 and the initial lumen assessment (Table E32). Domestic and other conventional small fittings comprise some 67.6% of the total number, but account for just under 20% of the light output overall. Floodlights of various types, at 32% of the units, produce over 80% of the 'private' lighting in the AONB (Table E40).

This is again considered later and in the LMP (Section F).



Light Fitting Type	Quantity	%	Unit Lm	Total Lm	Lm %	Lm %
Domestic lights	984	62.80%	875	861,000	16.48%	Domestic, other & specials
Other lights	66	4.21%	2,100	138,600	2.65%	
Specials	10	0.64%	1,250	12,500	0.24%	19.37
Large area floods	75	4.79%	24,500	1,837,500	35.16%	all floods
Other floodlights	432	27.57%	5,500	2,376,000	45.47%	80.63
<b>Total</b>	<b>1,567</b>	<b>100.00%</b>		<b>5,225,600</b>	<b>100.00%</b>	<b>100.00%</b>

▲ **Table E39:** Fitting quantities and lumen contribution.

Village	Domestic	Other	Special	HID Floods	TH / LED	Lm
Cann Common	78,240	16,638	1,415	55,462	317,489	469,244
Woodminton	35,000	0	0	0	66,000	101,000
Edmonsham	46,603	2,237	0	0	87,880	136,721
Farnham	62,949	11,109	2,645	25,920	104,739	207,362
Fonthill Bishop	17,093	17,777	0	47,860	85,953	168,684
Tollard Royal	100,927	2,329	2,773	0	158,600	264,629
Whitsbury	71,609	6,445	2,557	50,126	112,529	243,267
Bowerchalke	129,342	14,666	0	0	230,459	374,467
Broad Chalke	189,843	42,856	1,343	315,778	443,056	992,874
Fifield Bavant	6,125	0	0	0	71,500	77,625
Kilminster Common	34,708	2,450	0	0	128,333	165,492
Swallowcliffe	96,037	9,220	2,744	0	162,988	270,988
Gasper	21,618	7,782	0	0	13,588	42,988
Baverstock	21,820	0	0	0	78,375	100,195
Berwick St Leonard	28,903	6,503	0	1,390,968	476,903	1,903,277
All Landscape Types	940,818	140,011	13,476	1,886,114	2,538,393	5,518,813
<b>Total</b>	<b>17.05%</b>	<b>2.54%</b>	<b>0.24%</b>	<b>34.18%</b>	<b>46.00%</b>	<b>100.00%</b>

▲ **Table E40:** Lumen contributions for survey villages.

<sup>a</sup> These figures are taken from the summary calculations for each surveyed village (Table E33). They include lumen values for the 'no views' locations, based on the fittings per site calculations for that village. The figures are therefore higher than in Table E39, but appear generally consistent.

**Overall compliance:** Currently, compliance with the IDA 'fully shielded' and 3000 K requirements is somewhat low, at just under 10% across the AONB (Table E41). However, despite this and current levels of upward light from many street lamps, the sky quality remains remarkably good (see Section C). It is believed that this is, in part, associated with the use of PIR and / or manual switching off of lights when not needed, as well as the relatively low number of domestic light fittings and lit areas. The contribution of PIR control, amongst others, is therefore an important item for consideration (see Section 2.2.3). It is also fair to say that many fittings are of older type, and newer fittings are more compliant. We therefore expect a positive change in this percentage of compliant fittings in the future as we work with planners, developers, and local residents.



Properties				% by type of Surveyed	Fittings		'Compliant' Fittings	
Type / use	Survey	No View	Total		Qty.	Per Site	Qty.	of Total
Domestic	884	86	970	87.96%	1192	1.348	101	6.45%
Shop / Office	29	0	29	2.89%	61	2.103	9	0.57%
Industrial	23	1	24	2.29%	114	4.957	16	1.02%
Farm	29	11	40	2.89%	57	1.966	7	0.45%
Sports	1	0	1	0.10%	19	19.000	11	0.70%
School / Church	12	0	12	1.19%	22	1.833	2	0.13%
Other (Pub, Hotel, Hall etc.)	27	0	27	2.69%	102	3.778	10	0.64%
<b>Total</b>	<b>1,005</b>	<b>98</b>	<b>1,103</b>	<b>100.00%</b>	<b>1,567</b>	<b>1.559</b>	<b>156</b>	<b>9.96%</b>

▲ **Table E41:** Compliant domestic lighting.

Therefore, while domestic lighting presents a challenge, we are positive about effecting tangible change.

There is of course a level of domestic lighting on existing buildings over which the AONB has no planning control, with homeowners and business owners able to install lighting for security and access without any reference to the AONB or planning authorities. We set out our plans to meet this challenge in Section F (Lightscape Management Plan) and Section H (Safeguarding our Dark Skies: Future Plans and Commitments). They include a focus on public education, and active engagement with businesses, farms, and parishes, in particular through a Dark Sky Friendly Award Scheme and the offer of part funding to farms seeking to upgrade their lighting.

### 2.2.3. PIR usage data

The number of PIRs seen compared to the number of various fitting types (domestic and other) appears low, at just under 25% of all fittings seen (Table E42). This is however probably under-reported, due to the difficulty of identifying small inbuilt detectors. No PIRs could be seen for the small number of special fittings found during the surveys.

Fitting Type	PIR	Fittings	% / Fitting	% / Types
Domestic	104 /	984	10.57%	Domestic, other and specials
Other (larger FI and CFL fittings etc.)	14 /	66	21.21%	
Special (LED strips and signlights etc.)	0 /	10	0.00%	11.13%
Large area HID floods	10 /	75	13.33%	All floods
Other floodlights	260 /	432	60.19%	53.25%
<b>Totals / overall</b>	<b>388 /</b>	<b>1,567</b>	<b>24.76%</b>	

▲ **Table E42:** PIRs per fitting.

Clearly, the larger proportion of floodlights having PIRs (53% overall; or just over 60% for small and medium floodlights, which are most likely to be found on domestic properties) is advantageous, as they have the greater outputs and are most likely to be angled incorrectly.



The low result for the largest HID floods would appear to be a significant problem but, in practice, these are more likely to be PIR-controlled as a group, or even under building management control. They therefore probably fall into the under-reported category in terms of PIR or central control.

In the case of sports facilities, HID floodlights would always be under local switching and / or timed control. They are not in operation every night and are generally subject to a curfew time of 10.00 pm or similar. This will also be the case for some other Tungsten Halogen and LED units used at sports grounds.

Village	L-Type	PIR cells / Site / Village				PIR cells / Site / Land type			
Cann Common	1	49	/	91	53.85%	All Type 1			
Woodminton	1	11	/	21	52.38%	60	/	112	53.57%
Edmondsham	2	19	/	46	41.30%	All Type 2			
Farnham	2	23	/	69	33.33%				
Fonthill Bishop	2	19	/	43	44.19%	61	/	158	38.61%
Tollard Royal	3	25	/	55	45.45%	25	/	55	45.45%
Whitsbury	4	33	/	87	37.93%	33	/	87	37.93%
Bowerchalke	5	33	/	122	27.05%	All Type 5			
Broad Chalke	5	57	/	243	23.46%				
Fifield Bavant	5	12	/	15	80.00%	102	/	380	26.84%
Kilmington Common	6	13	/	36	36.11%	All Type 6			
Swallowcliffe	6	21	/	82	25.61%	34	/	118	28.81%
Gasper	7	4	/	17	23.53%	4	/	17	23.53%
Baverstock	8	4	/	16	25.00%	4	/	16	25.00%
Villages Sub-totals		323	/	943	34.25%	323	/	943	34.25%
Berwick St Leonard	(2)	65	/	62	104.84%	65	/	62	104.84%
<b>Totals / overall</b>		<b>388</b>	<b>/</b>	<b>1,005</b>	<b>38.61%</b>	<b>388</b>	<b>/</b>	<b>1,005</b>	<b>38.61%</b>

▲ **Table E43:** PIRs per surveyed site.

Calculated against properties actually surveyed in the roadside audit exercise, the PIR ratio improves to just under 39% (Table E43). This supports the probable under-reporting.

There is, however, clearly scope for improvement, and increasing the amount of PIR control is an area for development within the LMP.

***“I think it would be wonderful to have the AONB designated as a dark skies area. It’s so good to be able to see the stars, and we need to preserve this for future generations.”***

Feedback from Dark Sky Pledge responses.



## 2.2.4. Lumen calculations

Table E44 shows the values used in the calculations covering the whole AONB. These, as referred to above, are based on the initial rounded values and are generally 'worst case'.

Type /Watts	Lamp Lm	%	Lm	Lm used	Prop'n / Site	Prop'n (rounded)	Site Lm
<b>Domestic</b>							
T 60 W	800	* 50%	= 400	875	0.979	1.000	875
CFL 13 W	900	* 50%	= 450				
			= 850				
<b>Other (Larger FI &amp; CFL fittings etc.)</b>							
2-D Flu. 28 W	2,050	* 100%	= 2,050	2,100	0.066	0.100	210
<b>Special (LED strips &amp; signlights etc.)</b>							
LED 10 W	1,100	*	= 110	1,208		0.100	125
FL sign 20 W	1,220	*	= 1,098				
			= 1,208				
<b>Large area HID floods</b>							
SON 250 W	33,000	* 33%	= 10,890	24,500	0.075	0.100	2,450
MB 250 W	20,000	* 67%	= 13,400				
			= 24,290				
<b>Other floodlights</b>							
TH 500 W	9,500	* 30%	= 2,850	5,500	0.430	0.500	2,750
TH 300 W	5,000	* 33%	= 1,650				
TH 150 W	2,500	* 37%	= 925				
			= 5,425				
<b>Total</b>					<b>1.559</b>	<b>1.800</b>	<b>6,410</b>

▲ **Table E44:** Lumen calculation process.

From the analysis summaries, a lumen footprint for domestic lighting in all parishes in the AONB has been calculated as shown (Table E45). A rounding-up element has again been used.

The overall contribution of private lighting is just under 300 million lumens. (Shown on the bottom line of Table E45 is a calculation taking a case of 2.5

fittings average for each site. This gives an overall figure of just over 400 M lumens. We would therefore consider this our 'worst case scenario'. In terms of a simple lumen footprint per hectare (100 m x 100 m), the figures range between a low 205 Lm and 108,328 Lm.

In practice, these figures are difficult to use without some context of the disposition of the lighting within a parish. There will be large areas of even the 'brighter' parishes which have no lighting from domestic units whatsoever. Therefore, values should be seen as a broad marker, but nonetheless provide a good indication.

Parish 2011	Reference No. on parish map	All categories: Dwelling type	Area	Assessed Lm per site	Ln / Parish	Basic Lm / hectare footprint
Name		Qty	Hectares	Lm	Lm	Lm
E04003377 : Pamphill	1	313	1,678	6,410	2,006,330	1,196
E04003381 : Sixpenny Handley	2	554	814	6,410	3,551,140	4,363
E04003387 : Wimborne St. Giles	3	153	2,283	6,410	980,730	430
E04003364 : Colehill	4	2,901	449	6,410	18,595,410	41,415
E04003388 : Witchampton	5	186	532	6,410	1,192,260	2,241
E04003363 : Chalbury	6	61	927	6,410	391,010	422
E04003373 : Holt	7	540	1,459	6,410	3,461,400	2,372
E04003374 : Horton	8	185	521	6,410	1,185,850	2,276
E04003389 : Woodlands	9	213	1,530	6,410	1,365,330	892
E04003376 : Moor Crichele	10	107	2,444	6,410	685,870	281
E04003370 : Gussage St. Michael	11	90	1,157	6,410	576,900	499
E04003369 : Gussage All Saints	12	102	1,784	6,410	653,820	366
E04003367 : Edmondsham	13	82	331	6,410	525,620	1,588
E04003366 : Cranborne	14	334	814	6,410	2,140,940	2,630
E04003362 : Alderholt	15	1,311	371	6,410	8,403,510	22,651
E04003380 : Shapwick	16	85	752	6,410	544,850	725
E04003371 : Hinton	17	175	1,459	6,410	1,121,750	769
E04003408 : Fontmell Magna	18	334	997	6,410	2,140,940	2,147
E04003397 : Cann	19	229	955	6,410	1,467,890	1,537
E04010499 : Tarrant Keyneston	20	152	703	6,410	974,320	1,386
E04010495 : Langton Long Blandford (no data)	21	-	1,160	6,410		
E04010501 : Tarrant Rawston (no data)	22	-	868	6,410		
E04010500 : Tarrant Monkton	23	417	643	6,410	2,672,970	4,157
E04010502 : Tarrant Rushton	24	79	1,641	6,410	506,390	309
E04010498 : Stourpaine	25	277	999	6,410	1,775,570	1,777
E04010497 : Pimperne	26	503	1,632	6,410	3,224,230	1,976
E04003449 : Tarrant Launceston	27	156	1,059	6,410	999,960	944
E04003447 : Tarrant Hinton	28	129	2,948	6,410	826,890	280
E04010492 : Iwerne Courtney or Shroton	29	233	2,307	6,410	1,493,530	647
E04010493 : Iwerne Minster	30	326	2,202	6,410	2,089,660	949

▲ **Table E45:** Parish lumen footprint assessment (continues on next page).



Parish 2011	Reference No. on parish map	All categories: Dwelling type	Area	Assessed Lm per site	Ln / Parish	Basic Lm / hectare footprint
Name		Qty	Hectares	Lm	Lm	Lm
E04003444 : Sutton Waldron	31	93	1,877	6,410	596,130	318
E04003401 : Compton Abbas	32	98	1,967	6,410	628,180	319
E04003427 : Melbury Abbas	33	147	1,839	6,410	942,270	512
E04003405 : Farnham	34	105	1,114	6,410	673,050	604
E04003391 : Ashmore	35	97	956	6,410	621,770	650
E04003430 : Motcombe	36	611	557	6,410	3,916,510	7,031
E04003445 : Tarrant Crawford (no data)	37	-	1,488	6,410		
E04010488 : Blandford Forum	38	4,703	281	6,410	30,146,230	107,282
E04003412 : Hanford (no data)	39	-	1,884	6,410		
E04003419 : Iwerne Stepleton (no data)	40	-	1,218	6,410		
E04003446 : Tarrant Gunville	41	119	1,186	6,410	762,790	643
E04003399 : Chettle (no data)	42	-	1,399	6,410		
E04003434 : Shaftesbury	43	3,493	726	6,410	22,390,130	30,840
E04003394 : Bourton	44	386	1,327	6,410	2,474,260	1,865
E04004577 : Martin	45	171	1,149	6,410	1,096,110	954
E04004583 : Rockbourne	46	151	617	6,410	967,910	1,569
E04004563 : Damerham	47	232	804	6,410	1,487,120	1,850
E04012144 : Breamore	48	159	332	6,410	1,019,190	3,070
E04004588 : Whitsbury	49	96	1,590	6,410	615,360	387
E04004584 : Sandheath	50	244	812	6,410	1,564,040	1,926
E04008600 : Witham Friary	51	180	575	6,410	1,153,800	2,007
E04008591 : Trudoxhill	52	175	1,328	6,410	1,121,750	845
E04008583 : Selwood	53	367	376	6,410	2,352,470	6,257
E04008678 : Charlton Musgrove	54	178	860	6,410	1,140,980	1,327
E04008668 : Brewham	55	199	797	6,410	1,275,590	1,600
E04008742 : Pen Selwood	56	146	2,024	6,410	935,860	462
E04011732 : Heytesbury	57	379	189	6,410	2,429,390	12,854
E04011698 : Donhead St. Andrew	58	212	2,426	6,410	1,358,920	560
E04011708 : Ebbesborne Wake	59	100	626	6,410	641,000	1,024
E04011839 : Tisbury	60	1,093	855	6,410	7,006,130	8,194
E04011648 : Brixton Deverill (no data)	61	-	463	6,410		
E04011758 : Longbridge Deverill	62	376	748	6,410	2,410,160	3,222
E04011833 : Sutton Veny	63	320	2,031	6,410	2,051,200	1,010
E04011873 : Wylve	64	206	3,329	6,410	1,320,460	397
E04011649 : Broad Chalke	65	296	1,169	6,410	1,897,360	1,623
E04011830 : Stratford Toney (no data)	66	-	1,857	6,410		
E04011688 : Coombe Bissett	67	299	2,373	6,410	1,916,590	808
E04011700 : Downton	68	1,395	190	6,410	8,941,950	47,063
E04011647 : Britford	69	227	1,150	6,410	1,455,070	1,265
E04011829 : Stourton with Gasper	70	91	1,413	6,410	583,310	413
E04011699 : Donhead St. Mary	71	499	964	6,410	3,198,590	3,318
E04011841 : Tollard Royal	72	58	1,834	6,410	371,780	203
E04011633 : Berwick St. John	73	170	544	6,410	1,089,700	2,003
E04011622 : Alvediston (no data)	74	-	968	6,410		
E04011639 : Bowerchalke	75	171	643	6,410	1,096,110	1,705
E04011809 : Sedgemoor and Semley	76	267	417	6,410	1,711,470	4,104

Parish 2011	Reference No. on parish map	All categories: Dwelling type	Area	Assessed Lm per site	Ln / Parish	Basic Lm / hectare footprint
Name		Qty	Hectares	Lm	Lm	Lm
E04011774 : Mere	77	1,437	1,028	6,410	9,211,170	8,960
E04011850 : West Knoyle	78	68	1,004	6,410	435,880	434
E04011704 : East Knoyle	79	330	2,215	6,410	2,115,300	955
E04011853 : West Tisbury	80	275	2,222	6,410	1,762,750	793
E04011736 : Hindon	81	291	2,100	6,410	1,865,310	888
E04011832 : Sutton Mandeville	82	111	1,606	6,410	711,510	443
E04011719 : Fovant	83	336	2,397	6,410	2,153,760	899
E04011717 : Fonthill Bishop	84	68	1,047	6,410	435,880	416
E04011670 : Chilmark	85	230	573	6,410	1,474,300	2,573
E04011835 : Teffont	86	130	680	6,410	833,300	1,225
E04011697 : Dinton	87	311	993	6,410	1,993,510	2,008
E04011743 : Kilminster	88	139	2,644	6,410	890,990	337
E04011764 : Maiden Bradley with Yarnfield	89	160	2,106	6,410	1,025,600	487
E04011744 : Kingston Deverill	90	158	641	6,410	1,012,780	1,580
E04011738 : Horningsham	91	167	1,481	6,410	1,070,470	723
E04011690 : Corsley	92	323	852	6,410	2,070,430	2,430
E04011788 : Norton Bavant	93	51		6,410	326,910	
E04011641 : Boyton	94	110	863	6,410	705,100	817
E04011828 : Stockton	95	90	1,295	6,410	576,900	445
E04011844 : Upton Lovell	96	79	1,391	6,410	506,390	364
E04011747 : Knook (no data)	97	-	1,342	6,410		
E04011682 : Codford	98	398	958	6,410	2,551,180	2,663
E04011847 : Warmminster	99	8,002	1,442	6,410	51,292,820	35,571
E04011638 : Bishopstrow	100	61		6,410	391,010	
E04011637 : Bishopstone	101	294	349	6,410	1,884,540	5,400
E04011658 : Burcombe Without	102	67	602	6,410	429,470	713
E04011628 : Barford St. Martin	103	265	220	6,410	1,698,650	7,721
E04011726 : Great Wishford	104	157	1,518	6,410	1,006,370	663
E04011860 : Wilton	105	1,751	1,599	6,410	11,223,910	7,019
E04011781 : Netherhampton	106	209	1,314	6,410	1,339,690	1,020
E04011790 : Odstock	107	250	2,809	6,410	1,602,500	570
E04011826 : Steeple Langford	108	250	757	6,410	1,602,500	2,117
E04011823 : Stapleford	109	120	889	6,410	769,200	865
E04011875 : Zeals	110	319	6,410	2,044,790		
E04011718 : Fonthill Gifford	111	61	726	6,410	391,010	539
E04011669 : Chicklade (no data)	112	-	453	6,410		
E04011634 : Berwick St. Leonard (no data)	113	-	496	6,410		
E04011624 : Ansty	114	61	243	6,410	391,010	1,609
E04011834 : Swallowcliffe	115	92	478	6,410	589,720	1,234
E04011687 : Compton Chamberlayne	117	58	1,083	6,410	371,780	343
E04011813 : Sherrington (no data)	118	-	544	6,410		
(- These figures are missing)						
Assessment @ 1.8 fittings / site	<b>Totals</b>	<b>45,815</b>	<b>135,651</b>		<b>293,674,150</b>	<b>458,134</b>
					Min found	203
					Max found	107,282
Assessment @ 2.5 fittings / site (* multiplier of )			<b>1.38888</b>		<b>407,878,153</b>	



Based on the calculated average lumen value of 6,410 per property, the overall lighting footprint is a little under 300 M lumens. As we have included parishes that either straddle the AONB boundary or lie just outside but abutting the boundary, this is higher than if only parishes entirely within the AONB were considered. It does however represent the total lumens that might impact on the AONB, including light from neighbouring urban areas.

### *Impacts from urban areas outside the AONB boundary*

Parish	Lm / parish	Basic Lm / hectare
Alderholt	8,403,510	22,651
Blandford Forum	30,146,230	107,282
Shaftesbury	22,390,130	30,840
Downton	8,941,950	47,063
Mere	9,211,170	8,960
Warminster	51,292,820	35,571
Wilton	11,223,910	7,019
<b>Total</b>	<b>141,609,720</b>	

▲ **Table E46:** Lumen footprint assessment for more ‘urban’ parishes lying across or just outside the AONB boundary.

In this context, it is worth considering the lumen footprint for these more urban areas outside the AONB boundary separately. Table E46 shows their total lumen contribution, extracted from the information in Table E45. This shows that almost half the total lumen footprint calculated in Table E45 relates to these outlying urban parishes. This is not surprising given their greater population and property density. It also underlines that these urban conurbations provide the main threat to the dark night skies of the AONB (see also Section D). The remaining lumen footprint (just over half that calculated in Table E45) relates to villages across the AONB, and is therefore more disparate in impact. Additionally, the figures in Table E46 only include urban areas outside the AONB boundary where the parish boundary crosses or abuts the boundary. Towns and cities at a greater distance, such as Bournemouth, Poole and Salisbury also have an impact on light pollution in the area, and will have a higher lumen footprint.

### *Potential impacts from proposed buffer and core zones.*

It is also interesting to consider the number of properties in the core and buffer zones of the proposed IDSR, and how this might relate to light pollution threats. The number of residential and commercial properties in the buffer and core is very similar. In the core, there are 7730 residential and 360 commercial properties, and in the buffer there are 7280 residential and 420 commercial properties (figures given to nearest 10). In percentage terms, the number of residential properties in the buffer is 94% of the equivalent for the core, while commercial properties in the core come to 86% of the number in the buffer.

Given that the area of the proposed buffer (328 km<sup>2</sup>) is 50% that of the proposed core (655 km<sup>2</sup>), this means that the latter is more sparsely populated (not that the buffer is by any means densely populated). By our calculations, both would produce a similar lumen footprint over their respective area, but this would be more ‘spread out’ in the core. Even so, as already mentioned, the buffer also has many areas of good dark skies, and SQM readings there largely fall into at least the bronze category.



### 3. CONCLUSIONS

With many villages within the AONB unlit by street lights, and with domestic and many business lights switched off later at night, the AONB enjoys a much lower level of light pollution when compared with the urban areas outside its boundaries. The information presented in Tables E45 and E46 shows that almost half of the lumen footprint relating to parishes is related to the more 'urban' parishes that abut or cross the AONB boundary, and which therefore lie just outside or partly within the proposed buffer zone. Beyond this, urban areas such as Bournemouth, Poole, and Salisbury will add to the light pollution threats that affect the AONB itself.

The greater proportion of light pollution threats lie outside the AONB, and therefore outside the proposed IDSR. Within the AONB boundary there is nonetheless a good quality of night sky, in both the proposed core and, indeed, much of the buffer zone (Sections C and D) with many non-urbanised parishes crossing or just outside the boundary also being very dark.

Once the Wiltshire street lighting upgrade programme is completed, this will have a major positive impact. It will firstly significantly improve the street light fitting compliance across the entire AONB. Equally importantly (arguably more importantly, given the low level of street lighting in the AONB), it will reduce street lighting-related light pollution from urban areas in Wiltshire outside the AONB (Salisbury, Wilton, Downton, Mere, and Warminster): in these areas, where there is a much higher level of street lighting, lamps will be 3000 K CCT.

Within the AONB boundary, the main future tasks therefore lie in encouraging and promoting improvements to domestic and other business-related lighting. We also need to discuss street lighting CCT with Dorset Council.

The Lightscape Management Plan (Section F) sets out how we plan to address these challenges.

***"I have never seen so many stars in Britain before moving here."***

Feedback from Dark Sky Pledge responses.





# SECTION F LIGHTSCAPE MANAGEMENT PLAN



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# SECTION F LIGHTSCAPE MANAGEMENT PLAN

## SECTION SUMMARY

- The adoption of the AONB’s five-year Management Plan by the local planning authorities means that it becomes their policy for the AONB, including good lighting initiatives.
- The AONB has developed a range of good practice planning guidance relating to conserving dark night skies.
- Street lighting (provision, maintenance and upgrading/replacement) is primarily the responsibility of four highways authorities.
- All the local authorities operate part-night dimming or switch-off operation.
- Wiltshire has recently approved a programme, to start in 2019, to convert its streetlight assets to LEDs, with dark-sky compliant CCT (2700 K) specified for the AONB.
- Dorset completed its conversion of streetlights to part-night operation in 2017.
- The AONB’s responses to planning applications and policy formulation has significantly influenced LPA decisions relating to light pollution.
- The AONB’s Lightscape Management Plan builds on this work to embed guidance and good practice pertaining to lightscape management, with the objective of achieving the IDA five- and ten-year criteria for IDSRs.

**Relevant to IDA criteria:** M(A), M(C), M(E), M(F)

**Related appendices:** F.1, 2, 3 and 4: Local authority street lighting policies; F.5: Domestic light fittings and light distributions – improvement options; F.6 Littledown, Shaftesbury (housing development) - lighting strategy

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## Introduction

This Lightscape Management Plan (LMP) sets out:

How lighting is managed within Cranborne Chase AONB, and the respective responsibilities of the different planning and highway authorities.

Current policies and confirmed initiatives.

Our future strategy, both for working with the local highways and planning authorities, and in implementing AONB initiatives, to achieve the IDA five- and ten-year criteria.

In preparing the LMP, we have embodied recognised United Kingdom (UK) 'Best Practice' and good lighting ethics. The latter includes the IDA requirements, and guidance from the British Astronomical Association (BAA) / Commission for Dark Skies (CfDS), Campaign to Protect Rural England (CPRE), and central government departments and agencies.

Types of lighting and management strategies

The six broad types of lighting relevant to the AONB that are covered by this LMP are:

- Public (road and street) lighting
- Industrial, commercial and private area lighting
- Sports lighting
- Domestic lighting
- Farm lighting
- Military sites

# 1. LIGHTING MANAGEMENT RESPONSIBILITIES WITHIN THE AONB

As discussed in Section B and Appendix B.1, the AONB is not a planning authority. Responsibility for decisions on lighting in planning applications rests with the local authorities that cover the AONB area. For street lighting, responsibility lies with the four county-level Highways Authorities (Wiltshire, Dorset, Hampshire and Somerset; the latter two do not operate any street lighting within the AONB). The AONB has no planning control functions of its own in respect of domestic, commercial or street lighting.

This does not mean the AONB is not able to influence planning policy and developments. We produced a Planning Protocol in 2006 (see Appendix B.1 for a full copy), which was agreed by the LPAs and applies to planning policy and applications. The AONB is a consultee on planning applications that are within the AONB or which are just outside the boundary but affect its setting (this is set out in the Planning Protocol, which was approved by the Partnership Board). We have also issued guidance and position statements on a variety of planning matters, including light pollution and good quality lighting fittings (Appendix B.1).

We refer to these, together with the Institution of Lighting Professionals (ILP) guidance<sup>7</sup> and the CfDS report<sup>8</sup> on lighting types, qualities and impacts, in our responses to planning applications.

The AONB also produces a five-year Management Plan. The first was published in 2004. The 2019–2024 Plan has recently been approved and adopted. Crucially, the AONB's Management Plan is approved by the Partnership Board, and adopted by the constituent local authorities: its policies therefore become the policies of the local authorities (i.e. the LPAs) in respect of their responsibilities within the AONB. The new Management Plan includes the fullest statement yet on our strategies for preserving the AONB's dark skies. The relevant chapter is included at Appendix H.1.

<sup>7</sup> Institution of Lighting Professionals, 2011. Guidance Notes on the Reduction of Obtrusive Light.

<sup>8</sup> Bob Mizon, Commission for Dark Skies, 2016. Lighting Types, Qualities and Impacts.



Type of lighting development	Responsibility for approving*	Consultees include (not exhaustive, depending on application)
Street lighting	Highways authorities: Wiltshire, Dorset, Somerset, Hampshire Highways England	Local planning authority. The AONB engages with the highway authorities on new policies.
Major housing and other developments	Local planning authorities	AONB; parish and town councils relevant to location; other organisations, as appropriate; relevant highway authority (if roads/transport routes affected)
General planning applications	Local planning authorities	AONB; parish and town councils relevant to location

▲ **Table F1:** Responsibilities for lighting within and around the AONB.

Unitary authorities <sup>9</sup>	
<b>WILTSHIRE</b>	
<b>DORSET</b> <sup>10</sup> (was Dorset County Council until 1st April 2019)	
County Councils	District Councils <sup>11</sup>
<b>HAMPSHIRE</b>	<b>NEW FOREST</b>
<b>SOMERSET</b>	<b>MENDIP</b>
	<b>SOUTH SOMERSET</b>

▲ **Table F2:** Local planning authorities covering the AONB.

There are therefore four highway authorities and seven (nine prior to April 2019) LPAs covering the AONB, with Highways England also having lighting responsibilities within the AONB. This can create inconsistencies in terms of lighting developments. LPAs can impose lighting conditions on developments, and in many cases prefer to include supporting policies in their Local Development Plan (LDP). There is therefore a ‘lag’ phase in getting policies in place that are consistent across the AONB, as the LDPs for the Local Authorities cover different time periods. This means there may be differing timescales within which specific lighting policies will be updated and / or refined.

Nonetheless, robust and tangible progress has been and is continuing to be made. The future strategy builds on the good levels of engagement achieved to date (see sub-section 3).

<sup>9</sup> Many parts of England have two tiers of local government: county councils, and district, borough or city councils. In other parts of the country, there is just a single unitary tier of local government which provides all local services. County councils are responsible for education, transport, planning, fire and public safety, social care, libraries, waste management, and trading standards. District councils are responsible for refuse collection, recycling, council tax collections, housing, and planning. Unitary authorities are responsible for all of these functions.

<sup>10</sup> Dorset Council became a unitary authority on 1 April 2019, taking on the functions previously undertaken by East and North Dorset.

<sup>11</sup> Prior to 1st April 2019, there were two other District Councils – East and North Dorset – which were relevant to the AONB. Their functions are now managed by Dorset Council.



## 2. CURRENT POLICIES AND CONFIRMED INITIATIVES

### 2.1 Public lighting (road and street lighting)

#### The national picture

- In the UK, road and street lighting may be provided by local authorities, ranging from the largest, such as counties and cities/towns, through a range of district authorities, down to parish councils at the most local level. Strategic routes, including motorways and trunk roads, are managed by Highways England on behalf of Central Government.
- Road lighting is not a general requirement on roads, but may be provided by appropriate Councils, typically under their powers as Highway Authorities<sup>12</sup>. Where it is provided, however, there is then a 'Duty of Care' within UK law requiring it to be fit for purpose. This is usually achieved by designing it to British Standards.
- Street lighting on new estates which is due to become 'adopted' and hence local authority-owned remains the responsibility of the developer until the road is formally adopted as a public highway. This may be some years after it is first installed. From the point of view of residents, however, it will still be operational and should be maintained to proper standards.
- Road lighting design standards are set within British Standard BS5489 which is linked to the European CEN Standard EN13201 (this is unlikely to change significantly post-Brexit). These Standards determine appropriate lighting types according to a broad split between traffic routes requiring luminance design and residential type roads requiring illuminance design techniques. Suitable light levels and uniformity standards are then set based on factors such as traffic flow and crime statistics.
- For both luminance and illuminance designs, the standards define appropriate light levels based on the Environmental Zone in which the lighting system is, or will be, situated. This provides fine-tuning of lighting designs linked to the scheme's location within the landscape.
- Environmental Zones are defined by an ILP Guidance Note '*Guidance on the Reduction of Obtrusive Light*' (2011), which itself is based on a European CIE document.
- The zoning classifications range through E0 where no new external lighting would be permitted to E4 (a city centre). (See Table F3 below).

<sup>12</sup> Typically, this is via the local county councils in rural areas and district, town or city councils in urban locations. However, in rural areas it is also possible for English parish councils to provide and maintain some street lighting. These few lamps are usually poorly documented and the counties have no central records. It is therefore possible for some lamps to be parish owned and maintained.



Environmental Zones			
Zone	Surrounding	Lighting Environment	Examples
E0	Protected	Dark	UNESCO Starlight Reserves, IDA Dark Sky Parks
E1	Natural	Intrinsically dark	National Parks, Areas of Outstanding Natural Beauty etc.
E2	Rural	Low district brightness	Village or relatively dark outer suburban locations
E3	Suburban	Medium district brightness	Small town centres or suburban locations
E4	Urban	High district brightness	Town/city centres with high levels of night-time activity

**Table F3:** The Institution of Lighting Professionals' recommendation to LPAs for the environmental zones to use for exterior lighting control within their development plans. Lighting should either meet or exceed the guidance.

Cranborne Chase, as an AONB, is automatically designated as an E1 Zone (Table F3). This status is highlighted in planning information and advice provided by the AONB to the various local authorities' planning teams and available directly to developers and others.

In terms of new street lighting or development proposals in this AONB, where the local night-time environment is exceptionally dark, this will be protected. An E0 requirement of 'no lighting permitted' will be applied in future, wherever practicable. This will be achieved via consultation with the local highway authority in the case of street lighting and LPAs for other developments. Suitable controls will be part of Planning Consents in the latter case (this was achieved for at least two developments in 2018).

All development involving external lighting and internal lighting which might also have an effect on the external environment must otherwise incorporate the requirements and controls required of an E1 Zone.

Most street lighting in the AONB and immediate surroundings is provided by the counties of Wiltshire and Dorset (Hampshire and Somerset do not have any street lighting in the AONB), via their status as highway authorities (see Section B and Appendix B.1 for more details of the local authorities and their planning structure).

Policies and specifications for road lighting obviously apply to each local authority's entire area, not just the AONB. However, policies and programmes relating to locations outside but close to the AONB boundary are very relevant. This is because they have the capacity to either reduce or increase the level of 'threat' to the AONB's dark night skies posed by the lighting of surrounding urban conurbations.

As the rest of this section demonstrates, the overall impact of local authority policies within and outside the AONB, both past and planned, is to reduce the impact of light pollution.

## 2.1.1 Street lighting in Cranborne Chase AONB: an overview

Highways Authority	Proportion of AONB	Number of street lamps	Number of lit signs and bollards
Wiltshire	61.75%	566	87
Dorset	29%	286	14
Hampshire	7%	0	0
Somerset	2%	0	0
Highways England	0.25%	3 x 4way	8

▲ **Table F4:** Overall street lighting data for the four highway authorities and Highways England operating within the AONB.

Extracts from the road lighting policies of the County authorities are reproduced below, with the full documents in Appendices F.1–4.



### 2.1.2 Part-night street light switch-off and dimming

All of the above local authorities operate or are in the process of implementing or extending policies of 'part-night' lighting. This involves the switching-off of many street lamps, typically between the hours of midnight and 05:30. This reduces energy (and carbon) consumption, and hence financial cost. In summer, the early sunrise means that streetlights do not come on again until sunset. In winter, lamps operate in the early morning, from 05.30 to sunrise, to avoid the potential dangers of travel to work and/or school in the dark.

In some cases, 'unwanted' lighting may be identified and switched-off completely, prior to eventual removal. In another option, lighting may be reduced in output by dimming the output of lamps via electronic controls, as an alternative to 'part-night' operation.

In both the part-night and dimming situations, regardless of the light control quality of the existing fittings, there is a significant improvement to the local lightscape after midnight. Lamps will still switch back on from 05.30 until dawn during the winter months.

With most streetlights operated by the councils being placed in urban areas outside the AONB, the main impact is on skyglow.

Where a dimming policy is used, light levels are reduced but not absent. However, much of the equipment suitable for dimming will be of a more modern type, including LEDs. These fittings are much more likely to have good to excellent light control, with little or no upward light. The overall effect will therefore be proportionately better.

### 2.1.3 Other road lighting management

Highways England<sup>13</sup> is responsible for Motorways and Trunk roads in England, on behalf of the UK Government. There are no motorways in the AONB. However, the A36 between Warminster and Salisbury cuts in and out of its northern edge, and the A303 trunk road runs through the northern section of Cranborne Chase, roughly north-east to west. On the A36, at its junction with the A303 at Wylde, a lighting scheme was installed as part of a junction improvement some years ago. This comprises a small installation of three masts each carrying '4No' luminaires, as outlined in section E and listed in Table F4.

<sup>13</sup> Highways England operates, maintains and improves England's motorways and major A roads.



## 2.1.4 Local authority street lighting policies and initiatives

### a. Wiltshire Council

#### Wiltshire: current street lighting policy

Wiltshire's current policy documentation relates to its 'part-night' operation, which was implemented in 2014. An extract from their 2014 policy is given below (the full document is in Appendix F.1).

*Wiltshire Council has over 40,000 streetlights. Most of these are on all night whether they are needed or not. The Council needs to save money and reduce its carbon footprint by reducing energy usage. Rising energy costs, carbon tax and budget restraints make it necessary to change the way we light our streets.*

#### **The Scheme**

*About half of the street lights will be converted to operate for part of the night. Generally, they will be off between midnight and 5.30 am.*

*Lights at junctions, pedestrian crossings and where required for safety will remain on all night.*

*Where suitable the lighting levels of some street lights will be dimmed so they operate at lower output when traffic flows and pedestrian movements are reduced.*

*Lighting where there are CCTV systems, in town centres, and in areas where crime is a problem will remain on and at normal lighting levels.*

*A few lights may be removed permanently where they are no longer required.*

*The operation of the scheme will be monitored and changes will be made as necessary in the event of problems.*

#### New: Conversion of street lighting assets to LED in Wiltshire

Policies specifically related to the AONB and light control / colour of fittings etc. have been the subject of ongoing debate. This has culminated in an approved programme to convert all Wiltshire streetlight assets to LED, beginning implementation in 2019. In particular, the installation of new lighting will occur in two ways:

1. A lighting equipment change to low wattage LED sources, as a result of recent Council decisions on energy saving. This has now been specifically linked to AONB requirements for IDA-compliant street lighting.
2. Any street lighting for new housing developments within the Wiltshire section of the AONB will follow the same strategy.

In the AONB, the design specification for conversion will require warm white LEDs of **2700 K CCT**, minimising lumen outputs, and having no light directed above the horizontal. Areas outside of the AONB will utilise LEDs of 3000 K CCT (apart from any other protected landscapes in Wiltshire, which will also utilise LEDs of 2700 K CCT). Operating times and dimming parameters will at first follow current policy with many lamps switched off from midnight to 05.30am and/or a 25% reduction from 8 pm to 6 am), but the Council will be considering whether to increase the level of dimming in some areas, including the AONB.

The programme is now finalised (Table F5), funding approval was given on 11 December 2018 and a detailed budget agreed in March 2019. County-wide, the programme represents a major investment of over £12 million. The Year 1 programme covers areas close to the AONB, including Salisbury, yielding benefits for skyglow and light intrusion (Table F5). The AONB will be included in the Year 2 programme.

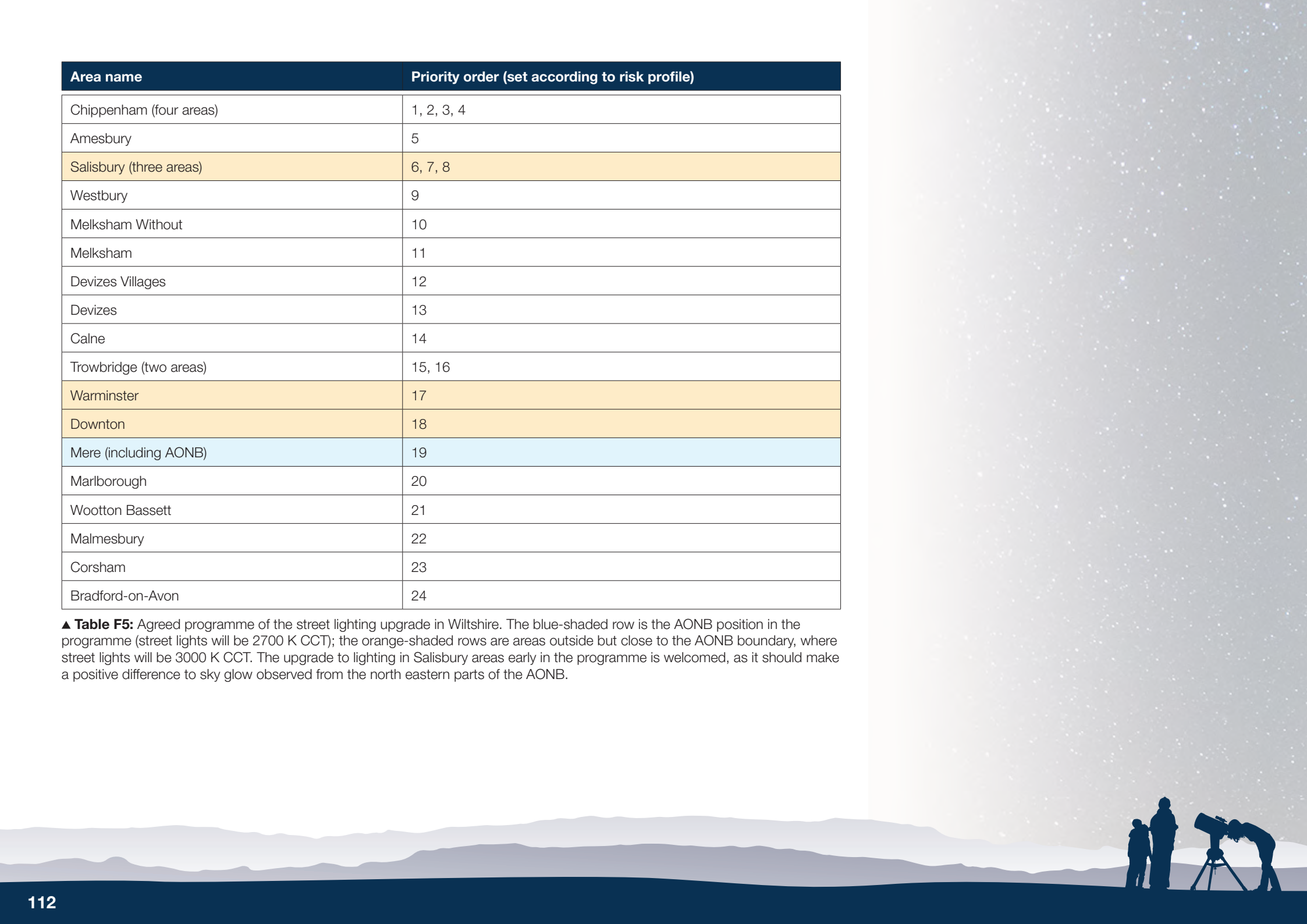
**The programme will represent a significant dark-sky / IDA-compliant initiative within the AONB/proposed IDSR boundary.**





Area name	Priority order (set according to risk profile)
Chippenham (four areas)	1, 2, 3, 4
Amesbury	5
Salisbury (three areas)	6, 7, 8
Westbury	9
Melksham Without	10
Melksham	11
Devizes Villages	12
Devizes	13
Calne	14
Trowbridge (two areas)	15, 16
Warminster	17
Downton	18
Mere (including AONB)	19
Marlborough	20
Wootton Bassett	21
Malmesbury	22
Corsham	23
Bradford-on-Avon	24

▲ **Table F5:** Agreed programme of the street lighting upgrade in Wiltshire. The blue-shaded row is the AONB position in the programme (street lights will be 2700 K CCT); the orange-shaded rows are areas outside but close to the AONB boundary, where street lights will be 3000 K CCT. The upgrade to lighting in Salisbury areas early in the programme is welcomed, as it should make a positive difference to sky glow observed from the north eastern parts of the AONB.



## b. Dorset Council

The Dorset policies and strategies<sup>14</sup> are currently the most comprehensive, covering Environmental Lighting Zone designations and the response to them in respect of light control. Shielded fittings with 0% upward light output are required for Zones E1 and E2 (Table F3). Dorset avoids the use of light sources with a high blue component, but for technical and economic reasons do use 'intermediate' 4000 K LED sources. At the time the policy was designed (2012), it would have been compliant with IDA criteria, although in some areas the upgrade would have been implemented after the IDA criteria were revised.

### Dorset: current street lighting policy

The following is extracted from the Dorset Street Lighting Policy 2011 (full policy at Appendix F.2).

#### 2.0 Street Lighting Objectives

*The aim of this policy is to assist in ensuring that the following Street Lighting Objectives, listed in no particular order, are met:*

*To improve the night-time safety of road users and members of the community.*

*To reduce crime and the fear of crime during the hours of darkness.*

*To provide public lighting that is cost effective, taking into account energy conservation and sustainability.*

*To minimise the adverse effect on the environment whilst still enhancing the night-time ambience.*

*To maintain the lighting asset so as to prevent premature structural failures*

*In conjunction with this policy the Street Lighting Specification, as included in the County Council's own Highway Guidance for Estate Roads, sets out the detailed requirements for developers to meet the standards of this Policy.*

*This document incorporates, wherever practicable, all relevant codes of practice and legislation, together with good industry practices and the national policies from the Institution of Lighting Engineers and UK Lighting Board.*

#### Lighting Provision

*There are a number of environmental factors that need to be considered when contemplating installing exterior highway lighting schemes. Firstly, whether there a real need to install lighting at all. If there is, then the energy usage and light pollution have to be taken into consideration (with sensitivity, if practicable, toward the daytime appearance of equipment).*

*For the purposes of determining whether or not lighting should be provided at a particular location, or on a particular length of highway,*

*The county is divided into an environmental zoning system.*

*This comprises four different categories which are also used to define the standards and type of lights to be used. These are listed below with a brief indication of the approach to lighting provision in each case:*

Dorset's street lighting specification (Dorset Specification for Street Lighting and Illuminated Traffic Signs/Bollards. PSL900A Rev3 – April 2016) included the following extract (also stated in the 2011 policy).

*Street lighting must comply with Dorset County Council's Street lighting and Illuminated Signs Policy - in particular the zoning system (the zone into which a development falls will be decided by the Engineer) the following is an extract from the policy:*

#### Environmental Zone 1

World Heritage site, Areas of Outstanding Natural Beauty, Sites of Special Scientific Importance and other Dark Areas - these are areas that currently have very low population densities and no, or intermittent, lighting.

Villages and settlements within this zone will generally only be provided with lighting when it is requested and funded by the Town or Parish Council, with support from the residents and interest groups. Such lighting will be limited to strategic locations such as telephone boxes, bus stops etc.

Apart from designated traffic routes all other lights may be operational for just part of the night, when levels of highway use are at their highest. Statutory and safety requirements may require that some lights remain in operation all night.

Lighting will generally only be installed outside of villages and settlements where there is a night-time safety issue that cannot be resolved by other means.

Careful design will ensure that, where possible, rural locations are not urbanised by the provision of a lighting scheme. Luminaires should be well controlled and restrict the upward light ratio to 0%.

<sup>14</sup> Dorset Street Lighting Policy 2011, and Dorset Street Lighting Specification 2016



### Recently completed initiative in Dorset

In 2017, Dorset County Council completed a programme, begun in 2012, to replace 75% of their street lighting stock to equipment compliant with their new lighting policy. In particular, the policy specified flat glass lanterns in rural areas of the AONB, and no lights in the AONB outside villages, other than on key roads and junctions.

This upgrade was followed by a policy change requiring part night streetlight operation across the County. This programme led to over 30,000 lights (Dorset-wide) in quiet residential areas being turned off between midnight (GMT) and 05:30 GMT. As well as reducing energy wastage and providing financial savings, this also has had an impact on light pollution and sky glow visible from the AONB.

The schedule opposite (Table F6) indicates the start date at which different areas either in or around the AONB changed to part-night operation. Some areas took a few years to complete, but the programme completed in 2017.

Electoral division <sup>15</sup>	Work started	Number of streetlights converted to part night operation
<b>Areas outside but close to AONB boundary</b>		
Christchurch	April 2012	5,030
Blandford	August 2012	984
Shaftesbury	October 2012	710
Ferndown, West Moors and Holt	January 2013	3,159
Verwood	May 2013	1,403
Wimborne Minster, Colehill and Stapehill	June 2013	1,491
<b>AONB</b>		
Northern rural area (includes the section of the AONB within Dorset)	January 2015	1,690 (of which 286 are in the AONB)

▲ **Table F6:** Programme start dates for conversion of streetlights to part night operation in Dorset.

<sup>15</sup> Administrative area used for County Council elections



### c. Hampshire County Council

Hampshire County Council's published documentation is in the form of a specification document (Street Lighting Design Guide and Department Standard Specification, 2010) for their current street lighting maintenance contract. It includes various tables showing the requirements and adaptations of British Standards at specific locations, together with details of approved lighting equipment. It allows for the use of white-light sources, specifying them in respect of Ra (colour rendering) values rather than CCT limits.

Although Hampshire operates no street lighting in the AONB, it is responsible for lighting in nearby Fordingbridge, with the potential to contribute to light pollution. Hampshire County Council does however operate a night light-dimming policy. Although the threat from sky glow remains, sky quality as evidenced by our SQM readings is already at IDA bronze level at the AONB boundary closest to Fordingbridge (c. 3 km distant from the town centre; see Section C, Fig. C7). With planned significant housing developments (currently in the early planning stages) in the town and in nearby Alderholt (which is in Dorset), it will be important to ensure Environmental Zone lighting guidance is adhered to.

The full Hampshire specification document is included at Appendix F.3

***“The dark skies in the AONB offered myself and others the chance to explore the stars somewhere fairly local to us. Hearing the additional benefits it would have on wildlife and to the local people it seems like a no-brainer.”***

Feedback from Dark Sky Pledge responses.



#### d. Somerset County Council

Somerset comprises the smallest area within the AONB and is at its most westerly edge. It also has no street lights within the AONB boundary. Frome is the nearest urban centre, situated approximately 5 km from the AONB.

Somerset's main published policy document covers its approach to reduction of street lighting in the County by switching to part-night operation for many lamps.

##### Somerset: current street lighting policy

Key statements are in the following extracts from the Somerset policy (the full document is at Appendix F.4, accessed from their website). Although light pollution is referenced, there is no specific AONB reference.

##### Reduction of street lighting in Somerset

We have consulted with a group of Parishes across Somerset to agree some test areas for the project, and will take the following approaches to reduce street lighting in Somerset:

*Part night lighting, which means switching off the lights in identified areas between 12 midnight and 5.30am*

*Light dimming, which means that we reduce light levels in identified areas by 50 percent*

*Converting lamps to LED, which provides more efficient direct lighting.*

##### Reduce light pollution

*Satellite data indicates that light pollution increased by 20% in Somerset between 1993 and 2000, showing that light pollution is on the rise. The impacts of light pollution in addition to wasting energy include:*

*Harming people's quality of life. For example, sleep disturbance when the light shines into homes*

*Interference with our view of the night sky*

*Impacts on the ecology and wildlife of an area, affecting the behavioural patterns of plants and animals.*



## 2.2 Planning applications

Section B and Appendix B.1 set out how the AONB operates within the planning system. The AONB is not a planning authority. It is a consultee of the seven (nine prior to April 2019) local LPAs, which are members of the AONB Partnership Board.

The AONB does not own any property itself. All properties, whether publicly or privately owned (most being the latter) are therefore non-AONB properties. All our efforts to achieve compliance are therefore of necessity focussed on engagement with the local planning authorities, other community organisations, residents, businesses, and farms.

We have completed an analysis of the way in which planning decisions were handled with regards to light pollution and dark-sky-friendly lighting, comparing two periods (July to December 2014 and January to June 2018). The analysis specifically compared the two periods in terms of the number of AONB responses which referred to the need to consider light pollution, and the number of LPA responses which placed a condition or information note on approval responses relating to light pollution, against the total applications approved. This was completed for all LPAs (Fig. F1), and individually for Wiltshire Council (Fig. F2) and East Dorset District Council (Fig. F3), which had the highest numbers of planning applications in the two periods (going forward, East Dorset's

planning responsibilities have been incorporated within the new Dorset Unitary Authority). Finally, an analysis was undertaken of the Councils that placed specific conditions on lighting in the 2018 period (Fig. F4). In each graph, the number of total applications is those approved in the respective periods; the total excludes rejected applications (because none were rejected on the basis of lighting considerations), withdrawn applications, and pre-applications.

The graphs in Figs. F3 and F4 indicate that in particular East Dorset has increased the extent to which it considers lighting aspects of planning development applications (we expect this to continue in the new Dorset Unitary Authority, which took on East Dorset District Council's functions on 1 April 2019). However, there was a difference in the number of applications decided between the two periods for each of the two LPAs (higher for Wiltshire and East Dorset in 2014 and 2018, respectively).

The overall message is one of:

- a. the increased attention of the AONB on control / elimination of light pollution in planning applications; and
- b. the increase in the number of LPA decisions that refer to light pollution considerations.

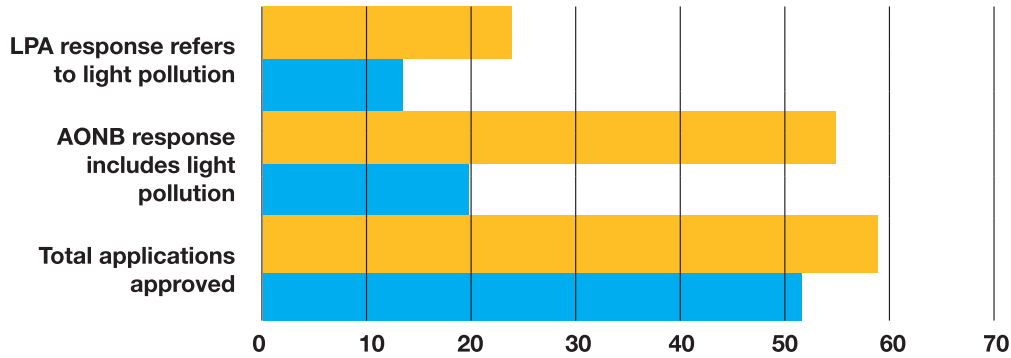
### *New housing development near Shaftesbury: working directly with developers*

The AONB is increasingly working directly with developers, at the stage when development proposals are being put together prior to seeking final planning approval. From experience, we are increasingly seeing this as an important way to influence the lighting (and other) aspects of planning applications, when they are first being designed. This is why we have produced good practice guidance on lighting for developers (Section B and Appendix B.1).

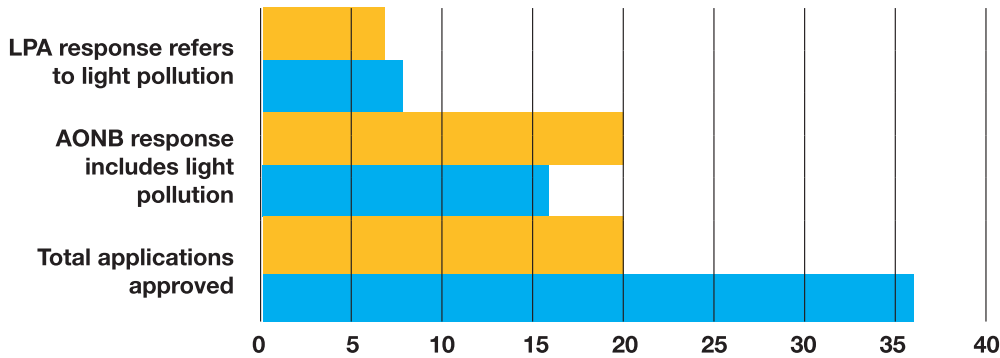
A very recent example is a development of 171 dwellings at Littledown near Shaftesbury in Dorset. This has now been approved by the planning authority. Early contact with the developer pre-planning approval meant that lighting aspects were agreed in advance, and are compliant with IDA criteria. Early contact with the developer pre-planning approval meant that lighting aspects were agreed in advance, and are compliant with IDA criteria. This illustrates the way in which we are increasingly engaging with and influencing decision takers and developers in considering good external lighting in new developments.

Extracts from the lighting plans associated with the development are attached as Appendix F.6.

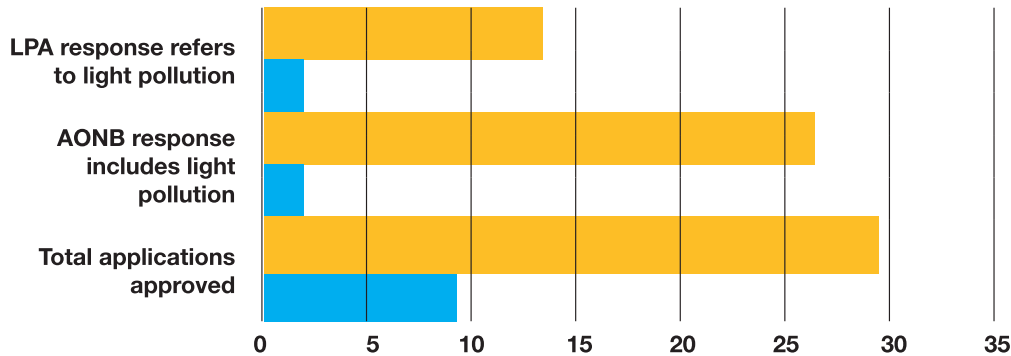




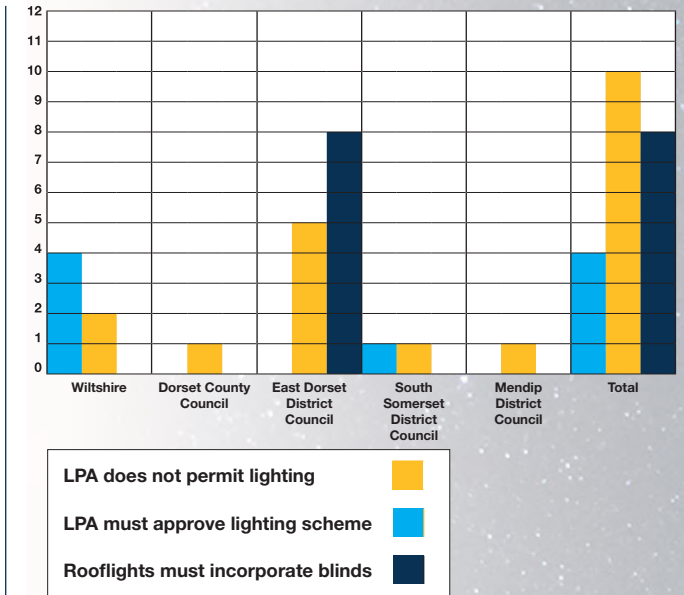
◀ **Fig. F1:** Comparisons of applications received from all nine LPAs in July to December 2014 and January to June 2018. The most notable difference in the two periods is the extent to which the AONB refers to light pollution, but the number of planning application decisions responding on the topic has increased. The horizontal axis in all graphs in Figs. 1 to 3 (vertical axis in Fig. 4)' refers to numbers of applications (not percentages).



◀ **Fig. F2:** Comparison of applications received from Wiltshire Council in July to December 2014 and January to June 2018.



◀ **Fig. F3:** Comparison of applications received from East Dorset District Council in July to December 2014 and January to June 2018.



▲ **Fig. F4:** Numbers of planning approvals which placed specific conditions on lighting in January to June 2018. There were only a small number of similar conditions imposed in the 2014 period, with most responses simply referring to a general need to mitigate light pollution.

January - June 2018 ■ July - December 2014 ■



There follow some examples of wording (Table F7) used in planning decisions issued by the various LPAs. These highlight the influence the AONB is having on planning decisions.

<p><b>East Dorset, January 2019: Mobile home for use as mess room.</b></p> <p>Any external lighting on the application site shall be installed so that the light from it is directed downwards and designed or shielded to prevent upward, sideways, and outward light spillage into the night sky.</p>	<p><b>Reason:</b> To prevent light pollution of the dark night sky in the Area of Outstanding Natural Beauty.</p>
<p><b>East Dorset, September 2018: home extension.</b></p> <p>No external lighting shall be installed other than that first submitted to and approved in writing by the local planning authority.</p>	<p><b>Reason:</b> To maintain the character of this part of the Area of Outstanding Natural Beauty.</p>
<p><b>East Dorset, March 2019: Change of agricultural land to equestrian stud business</b></p> <p>External lighting, and internal lighting within the stables, indoor arena and hay barn, shall be installed in accordance with the submitted Lighting Strategy Plans Ref. LS14335-3-1 and LS14335-1-4. Notwithstanding the details shown on the above plans the Luminaire A Column lights installed in the manege shall be limited to 5m. No additional external lighting, or internal lighting within the stables, indoor arena and hay barn, shall be installed without the express written permission of the Local Planning Authority. The indoor arena and manege shall not be lit outside the hours of 7.30am-7.30pm Monday to Saturday, and 9am-6pm on Sundays.</p>	<p><b>Reason:</b> To safeguard the Dark Night Skies of the Cranborne Chase AONB</p>
<p><b>Wiltshire, June 2017: Demolition and replacement house / stables.</b></p> <p>No external lighting shall be installed on site for the arena and replacement barns (stables)... until plans showing the type of light appliance, the height and position of fitting, illumination levels and light spillage... in accordance with the following guidance:</p> <ul style="list-style-type: none"> <li>i) Environmental Zone standards set out by the Institution of Lighting Engineers..., and</li> <li>ii) AONB Partnership Guidance: Position Statement on Light Pollution and Good Practice Note on External Lighting, have been submitted to and approved in writing by the Local Planning Authority. The approved lighting shall be installed and shall be maintained in accordance with the approved details and no additional external lighting shall be installed.</li> </ul>	<p><b>Reason:</b> In the interests of the amenities of the AONB and to minimise unnecessary light spillage above and outside the development site.</p>

▲ **Table F7:** Examples of wording used in LPA decisions.





# 3. OUR FUTURE STRATEGY

## 3.1. Strategy and Lightscape Management Plan

Our aim is that, through engagement with the LPAs, developers, and other relevant parties, we achieve the basic principles of our lighting strategy. These are that the fundamental elements of all lighting managed directly under the plan, and all education and liaison regarding recommendations and improvements to existing light sources and equipment within the AONB area are covered by the policies set out in Table F8.

<b>Policy A</b>	Within the overall E1 designation of the AONB, in areas akin to E0 environmental conditions and where no special needs are identified, no lighting shall be permitted on new development. Planning consent shall incorporate special controls to achieve this <sup>16</sup> .
<b>Policy B</b>	The overall principles behind any lighting within and/or close to the AONB, shall be: <ol style="list-style-type: none"> <li>a. Elimination of direct upward light.</li> <li>b. Illumination levels correctly matched to:                 <ol style="list-style-type: none"> <li>1. The needs of the task.</li> <li>2. The area to be lit, with spill light strictly controlled.</li> </ol> </li> <li>c. Minimising of light presence within the landscape.</li> </ol>
<b>Policy C</b>	<ol style="list-style-type: none"> <li>a. Lighting equipment containing light sources exceeding 500 Lm shall be fully shielded i.e. emit no direct light above the horizontal and shall be installed and maintained in the correct orientations to achieve and maintain this.</li> <li>b. Lighting equipment containing sources up to 500 Lm may be unshielded, but shielded versions will be preferred.</li> </ol>
<b>Policy D</b>	The targeted Correlated Colour Temperature (CCT) of light sources within the AONB shall be 3000 K, and preferably lower.
<b>Policy E</b>	PIR control shall be incorporated in all new domestic, industrial and commercial lighting equipment, either individually or via grouped-control.
<b>Policy F</b>	Street lighting systems shall follow the principles of Policies A to D, using flat-glass luminaires and light sources of 3000 K or less. Systems will not be installed unless there is a clear need.  Where provided, unless all-night operation is required on grounds of road safety or security, part-night operation combined with dimming, shall be the norm.
<b>Policy G</b>	<ol style="list-style-type: none"> <li>a. Sports lighting and other area floodlighting systems shall only be permitted when properly designed, installed and maintained in accordance with the requirements and principles of these policies. Limits on light spill beyond the site boundary shall be achieved and maintained.</li> <li>b. Sports lighting systems shall be subject to an appropriate curfew time, as determined by Planning Consent.</li> <li>c. Decorative lighting shall comply with these policies and the principles behind them, with any relaxation in respect of upward or spill light being offset by strictly limited operation times, set within the Planning Consent.</li> </ol>
<b>Policy H</b>	Policy objectives will be achieved on the basis of the AONB's: <ol style="list-style-type: none"> <li>a. Responses to planning application consultations and engagement with LPAs and others.</li> <li>b. Guidance, education and advice provided in publications, liaison and outreach activities.</li> </ol>

▲ **Table F8:** Basic principles of the lighting strategy set out in the Lightscape Management Plan.

<sup>16</sup> This process has been in operation since 2018 and has been applied to at least two locations so far.



This strategy is set against a history of the AONB's promotion of dark skies and the reduction of light pollution through its planning policy and guidance (Table F9). The AONB has worked with the LPAs, and with parish councils through their Neighbourhood Plans over several years on this issue. As the previous section of this LMP illustrates, this is bearing fruit in LPA consideration of the lighting aspects of planning decisions and approvals. Indeed, the intended dark-sky-compliant lighting aspects (in respect of the AONB and similar protected areas) of Wiltshire Council's recently announced major street lighting upgrade were influenced by ongoing discussions and direct engagement with the Council.

Thus, we have made good use of positive opportunities for long-term engagement and discussions with the planning decision-takers. The future strategy contained in this LMP therefore builds on this history of constructive engagement.

By operating the Lightscape Management Plan, we intend to:

- Avoid problems with new lighting proposals.
- Manage any existing problems and set out a clear framework for dealing with any which may develop.
- Promote good lighting design and use of high quality fittings, correctly installed and maintained.
- Educate and inform the public on the benefits of dark night skies and ways to achieve this.
- Implement initiatives to provide information and training for both planning decision makers, and those specifying and installing lighting equipment.
- Facilitate local initiatives for improvements to domestic and other lighting.
- Publicise the achievements of individuals and groups as an incentive for improving their local night-time environment.
- Promote these to the local media.
- Review the situation regularly to determine the effectiveness of policies, strategies and initiatives implemented in Cranborne Chase and from the wider dark skies community network in the UK (see Section H).
- Revise and adapt our processes and actions accordingly.

Table F10 sets out the key elements of our Lightscape Management Plan. It should be read alongside the Dark Night Skies chapter of the AONB's Management Plan 2019–2024 (see Appendix H.1) and the specific indicators we have set ourselves (Section H) in order to achieve the goals in this LMP.



Date	Document	Description
2004	AONB Management Plan: 2004 to 2009 <sup>17</sup>	Objective to 'support the protection of rural tranquillity, remoteness and dark night skies.'
2005	Planning Protocol	LPAs agreed that the AONB would be a consultee on planning policy and decisions.
2007	Dark Skies and Light Pollution Study: Final Report	Report commissioned by the AONB from ENTEC UK Ltd.
2008	Position Statement 1: Light Pollution	AONB's position on criteria for external lighting.
2009	AONB Management Plan: 2009 to 2014	Expanded on the previous Management Plan through explicit reference to light pollution.
2012 to 2013	Dark night sky training and networking with other dark sky reserves	Undertaken in order to gain information and advice for future dark sky policy development.
2014	AONB Management Plan: 2014 to 2019	Set out the AONB's intention to apply to be an IDSR.
2014	AONB Annual Planning Seminar: Reaching for the Stars	The annual AONB seminar for LPA planners and transport teams focussed on dark skies as its main topic.
2016	CPRE 'night blight' report	The AONB contributed financially to the data gathering.
2016	Good Practice Note 7: Good External Lighting	The AONB's more specific guidance on good lighting for different requirements.
2016	Lighting Types, qualities and Impacts	A report by Bob Mizon, CfDS, on best practice relating to external lighting, and to which we refer in our responses to planning applications.
2016	AONB Annual Planning Seminar: Landscapes in Planning	This annual seminar included an update on dark skies.
2018	Good Practice Note 7a: Recommendations for Dark-sky Compliant Lighting on New Builds and Refurbishments – a Developers' Guide	A guide for developers on types of compliant lighting.
2018	AONB Annual Planning Seminar: Achieving Community Benefits from Dark Skies	This year's annual seminar focussed on the various benefits – from wildlife and human health to tourism – of preserving and actively promoting dark night skies.
2019	AONB Management Plan: 2019 to 2024	Includes a chapter and annex dedicated to objectives relating to dark skies and preventing light pollution.
2019	Good Practice Note 7b: Examples of dark-sky type compliant lighting units for use on new builds and refurbishments, in and around the AONB area	A guide for developers giving examples of specific compliant light fittings.

▲ **Table F9:** AONB and dark night skies – a planning documentation and policy timeline.

<sup>17</sup> AONB Management Plans are agreed and adopted by the partner LPA(s)



## Lightscape Management Strategy: Key Elements and Analysis of Matters to be Handled

<p><b>Street lighting</b></p>	<p>We will continue to work with the local highways and planning authorities to promote IDA-compliant street lighting in any new developments or street light replacement schemes. The Wiltshire LED replacement scheme is a major programme, and will deliver compliant lighting within the AONB area over the next two years.</p>
<p><b>Industrial, commercial and private areas (e.g. parking and schools)</b></p>	<p>New lighting will continue to be managed within the planning process. In its responses to planning applications, the AONB will continue to make clear that all new lighting proposals and planning applications must be accompanied by adequate designs and lighting calculations, which always include aspects such as task lighting levels, appropriate spill lighting calculations, upward light control and lighting impact assessments.</p> <p>We will always require that design targets and calculations are based on the E1 Zone status of the AONB. This should also apply, where appropriate, to new lighting in areas immediately outside the AONB, given such developments have the potential to impact on the setting of the AONB's interior.</p> <p>The AONB's Good Practice Notes for developers will continue to be used to provide advice and to encourage best practice.</p>
<p><b>Sports lighting (may also be associated with schools)</b></p>	<p>Where new projects are submitted, in or adjacent to the AONB, these will be encouraged to fully comply with the AONB guidance and local planning requirements with full design criteria, calculations and spill light controls incorporated in a professional design. Such new lighting should always be the subject of careful scrutiny with the appropriate Councils, and compliant with AONB guidance. This will be the subject of ongoing engagement with LPA staff via the AONB.</p>
<p><b>Military and similar installations</b></p>	<p>Some Government (military) sites exist within the Cranborne Chase AONB. They have some exemptions from AONB guidance and regular planning controls. The sites have special security needs which ultimately determine what lighting may be required. The largest site is Blandford Camp, and the CPRE 'Night Blight' map (Section C) clearly illustrates the effect on light pollution. The Camp is in the buffer zone of the proposed IDSR.</p> <p><b>The AONB has an ongoing relationship with Blandford Camp and will be engaging further with them on this issue.</b></p>



▲ **Fig. F5:** Bob Mizon and Andy Best, Site Manager of Wimborne First School, in 2018, discussing lighting plans for a new school building.

▲ **Table F10:** Lightscape Management Plan – key elements (Table F10 continues on the following pages).



## Domestic lighting

### **Existing domestic lighting**

Existing domestic lighting is not subject to any planning controls in normal circumstances<sup>18</sup> (even were the AONB an LPA), and we therefore have no direct control. The aim is (and this has been the case for some years) for potential problems to be identified and resolved at the planning stage. In all lighting matters, protecting dark skies will continue to be a major concern in the AONB and in our discussion on planning applications with the LPAs.

### **Proposed new domestic lighting: planning opportunities and AONB policy**

Where external lighting is proposed on new housing within the AONB, developers are already being advised to use fully shielded porch lights, even where below 500 Lm, and are being encouraged to use fully shielded floodlights on other high output fittings. We are in discussion with developers of major housing developments to include compliant external lighting on houses in the initial build. This will help prevent post-development installation of non-compliant lighting by individual householders.

An AONB Good Practice Note (Table F9) on external lighting was published in 2016. This was primarily an explanation of the AONB's lighting needs based on its aim of minimising light pollution. In early 2018, a supplement was produced (which supports the LMP Policies B and C; Table F8), showing examples of external fittings with the necessary light control as a visual guide for developers.

Building on the above, a second Good Practice Note, giving named examples of good fitting types and potential suppliers, has recently been prepared. This is available to developers for use in planning lighting fittings and giving specific examples of dark-sky-friendly units. It follows the principles indicated by the IDA's publication of equipment types available in the USA that comply with its light control principles.

### **Education and engagement**

The primary approach for promoting compliant domestic lighting must be one of education. There are no statutory controls available directly and the best approach will continue to be via community involvement through local councils or groups and via education within local schools.

*Emphasis will be placed on:*

- The environmental benefits of protecting the night sky.
- Avoiding waste of light and ensuring the correct amount of light is provided where needed around premises.
- Energy (and hence money) saving (including carbon reduction).
- Explaining that good lighting ("right light, right place, right time") does not compromise, and in fact can enhance, safety and security.
- Encouraging the standard use of fittings incorporating PIR control as a way of achieving the above goals

**In this context, the AONB will set up a dark-sky-friendly accreditation initiative. This would involve setting criteria for different kinds of development and existing premises – from major new housing developments, to street lighting schemes, to schools, to parish communities, and to farms and tourist businesses. Where the criteria are met, we would award 'dark-sky-friendly' status, which the business or group or business can then display and use to promote their activities (see Section H for fuller description of the proposed scheme).**

<sup>18</sup> External lighting may be considered a nuisance within the Clean Neighbourhoods and Environment Act 2003. As such there may be cause for Environmental Health officers to assess and require remedial action by a householder, with the possible sanction of Court enforceability. However, as for some industry and transport needs along with sports lighting, the Act permits some exemptions. The difficulty with the Clean Neighbourhoods and Environment Act is that it is there to deal with problems retrospectively, following complaints by the public. It is important to note, however, that domestic lighting is, unless a right has specifically been removed by the LPA, a 'permitted development right'.



## Farm lighting

### ***Farming: an essential feature of the AONB's landscape and community***

As a working rural landscape, the presence of many farmsteads, both small and large, is an inherent feature of the AONB, by day and night. Farming covers 86% of the AONB's landscape, and forestry a further 10%. Although farm lighting embodies aspects of industrial / commercial floodlighting and domestic lighting, it is considered a sufficiently important aspect of the AONB lightscape to merit special attention. This is particularly given the importance of farming to the enhancement of the AONB landscape.

### ***Farming activity: lighting needs and potential issues***

Typical of this area and the UK, farms and smallholdings are commonly of 'mixed' type, meaning they encompass livestock and arable farming, both of which involve 24-hour activity and/or lighting in some circumstances and at certain times of year (e.g. in the lambing season from January to April, or when harvesting is undertaken after dark, due to crop maturity and weather conditions). Farms are also concerned about rural crime, and may install lighting in an effort to minimise risks of theft.

### ***Engagement with the farming community***

Cranborne Chase AONB operates a Farm Cluster initiative, in which groups of farmers work together to promote environmentally friendly initiatives. We have recently begun to engage with farmers in these clusters about dark-sky-friendly lighting. We have discussed with the National Farmers Union representatives and Rural Crime Officers of Wiltshire and Dorset police authorities the advantages to farmers and landowners of having dark-sky-friendly lighting on holdings. Their main priorities are financial savings and security, and they acknowledge how dark-sky-friendly lighting can assist in these issues. We will continue discussions with farmers in the future, alongside police officers, at their regular meetings. We will also aim to initiate and maintain a programme for education and advice to farmers and smallholders about good lighting practice including:

- Correct choice and installation of new fully shielded fittings, with PIR switches.
- Reducing elevation of existing fittings and developing shielding methods wherever possible, when upgrade or replacement cannot be achieved in the short-term.
- Promoting PIR switching where not installed.

**We have produced a short leaflet specifically aimed at farmers' requirements and issues.**

**We will also promote a part-funding scheme (within a fixed budget) to support farmers in replacing or upgrading their lighting (the AONB Partnership Board agreed this at their meeting in December 2018).**



## 3.2. Parish and town councils

Parish and Town Councils are a very important part of our efforts to promote good lighting. Not only are their residents generally very supportive of preserving the dark night skies for all to enjoy, the Councils are also decision-takers and influencers at local level.

Some Parish Councils have prepared or are currently preparing their Neighbourhood Development Plans (NDPs). Seven parish councils have to date formulated NDPs, though some require approval via a local referendum. The seven parishes are Bourton, Broad Chalke, Fontmell Magna, Hindon, Motcombe, Pimperne and Tisbury. We are encouraging them to include wording relating to dark skies and minimising light pollution, and have developed some standard wording to propose to Councils to include in new NDPs being produced. A typical example is from the Motcombe NDP – Fig. F6 – and policies related to dark skies are included in other parish NDPs.

This level of engagement at local policy decision-taking level reflects the strong commitment to minimising light pollution that we see from individual residents and parish councils across the AONB. This gives us great confidence about the improvements we will be able to support by working with parishes and local people.

### Dark Skies

**3.32** The Cranborne Chase AONB is hoping to gain Dark Sky Reserve status, recognising that over 90% of the area is amongst the least light polluted in England, meaning that residents and visitors can witness the majestic arc of the Milky Way on a clear night. The impact of light pollution from the nearby towns of Shaftesbury and Gillingham can be clearly seen on the interactive maps produced by the CPRE, with light pollution also noticeable from the village. Although some lighting can be necessary for safety and security reasons – and the household survey showed that a small minority would like to see more street lighting – most light pollution can be reduced through careful design of windows and choice of illumination methods. For example, lights using motion-sensors and timers, down-lighters or 'wall washers' generally have less impact, and light spill from large glazed areas can be reduced through the use of overhangs. By including a policy in this Plan, the impact of lighting should be considered at an early stage and unnecessary light pollution avoided, to everyone's benefit.

#### Policy MOT7b Dark Skies

Development should be designed to conserve and enhance the intrinsic quality of the dark night skies. Lighting which is proposed to be installed should meet or exceed the level of protection appropriate to Environmental Zone 1 (as defined by the Institution of Lighting Professionals), with the addition that external lighting should not exceed a correlated colour temperature (CCT) of 3000K...

▲ **Fig. F6:** Extract from Motcombe Parish Council Neighbourhood Plan.



### 3.3. 'Active' domestic lighting

During the domestic roadside surveys, we received anecdotal evidence from some residents that their villages (even locations with significant numbers of exterior domestic lights) were usually very dark at night. Coincidentally, discussions with others involved in dark sky surveys elsewhere in the UK indicated that this is also the case in other areas.

As a result of this, evening checks were undertaken in some of our survey villages to assess how much lighting was actually in use. The process was to find a suitable safe observation point and identify domestic properties with visible exterior lighting.

Village	Date / time	Houses counted	Lights on	Lights off	% off
<b>Broad Chalke</b>	19/3/19 (21.30pm)	13	4	9	69.23
<b>Cann Common</b>	20/3/19 (21.20pm)	26	1	25	96.15
<b>Tollard Royal</b>	20/3/19 (21.50pm)	21	2	19	90.47
<b>Farnham</b>	20/3/19 (21.30pm)	62	4	58	93.54
<b>Kilmington Common<sup>19</sup></b>	22/3/19 (22.00pm)	37	8	29	78.37
<b>Totals / overall %</b>		159	19	140	88.05

▲ **Table F11:** Actual domestic lighting in operation.

As some roads were narrow and without footpaths, night-time road safety requirements limited available observation points. Therefore, the viewable area samples were sometimes small, as in Broad Chalke, Cann Common and Tollard Royal. In Farnham and Kilmington Common however, most available properties were sampled. Overall, the figures are considered representative of the actual night-time situation in the villages.

From the evidence of these results, it appears likely that the presence of domestic fittings is no guarantee that they are used on anything like a continuous basis. Even where PIRs are not in evidence, it seems that the householders themselves are minimising use of external lighting. This may contribute to the good quality of SQM readings, alongside the other factors explained in Section C, and gives support to our policy promoting wider use of PIR control on existing fittings, together with adding this as a planning requirement for new developments.

<sup>19</sup> Floodlights and festoon lights on outside Social Club,(before closing time).

### 3.4. Domestic lighting: current assessment as basis for future upgrading / improvement decisions

Where fittings do not comply with IDA requirements, ways to remedy this form part of the AONB's commitment to achieving compliance within a ten-year timeframe.

#### 3.4.1. Investigation design

To assess the problems, and as a basis for future improvements, some simple investigations of typical small fittings were undertaken (Figs. F7 to F11; a description of the results follows the Figures). This was undertaken in order to set a baseline for our future work to improve light fittings to compliant levels. We considered a typical, widely used 'heritage' design fitting, but the principles would broadly apply to more contemporary styles. Generally, all were originally developed to take normal GLS (General Lighting Service) domestic tungsten lamps, typically 60 W (800 Lm). Newer variants have been produced to take tungsten-halogen and compact fluorescent lamps (CFL), but generally allow the source to be fully visible. Even where householders have replaced 60 W tungsten lamps with CFL, the problem of light source visibility has not been resolved. Figures F7 to F11





show a series of experiments set up to establish the effects of a variety of LED sources in upward and downward-pointing lampholders.



▲ Fig. F7: Typical pendant 'Heritage' style.



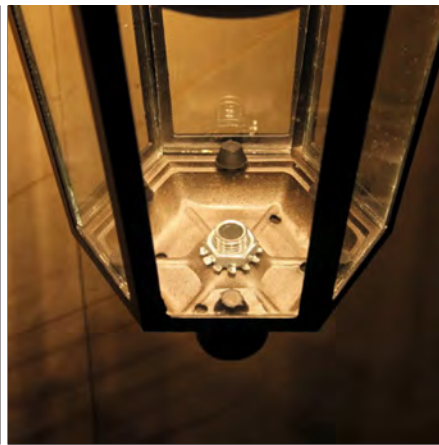
▲ Fig. F8: GU10 'Downlighter' lamp in ES - GU10 Adapter.



▲ Fig. F9: GU10 downlight holder fixed in canopy.



▲ Fig. F10: Luminaire experiment. Domestic GU10 downlighter unit replacing original lampholder.



▲ Fig. F11: Reflections from glazing and luminaire base.

### 3.4.2. Investigation results

Currently the top-fixed / pendant style fittings seem to offer better options for dark-sky-compliant upgrades over the bottom-fixed 'coach' style. Fig. F7 shows a 400 Lm LED variation on a GLS lamp, but the globe diffuser clearly emits direct upward light, apart from any inter-reflections.

Using a simple adapter and fitting a 425Lm GU10 lamp results in much better light control (Fig. F8). The fitting adapter in Fig. F10 moves the smaller lamp down to a similar position to a GLS or CFL equivalent. It looks more utilitarian, however, and there is some doubt about the long-term electrical safety compliance of such adapters.

Figures F9 and F11 show a combined outdoor luminaire and indoor downlighter experiment. The glazing angles however still produce some secondary reflected uplight.

Downwards was clearly best. Although there was still a small upward light element, and only proper photometric tests would determine the exact component, it is considered that such fittings provide the best practical retro-fit light control solution.

With the alternative of a non-replaceable LED COB light source being fitted within the canopy, the same effectively 'fully shielded' situation would apply, again with some element of minor internal and base reflections.



With any replaceable light source, the use of warm white 3000 K lamps would remain essential. The Dark Skies LED COB would also need to be 3000 K (all of the lit images are shown with 3000 K LED lamps).

Until recently, few dark-sky-compliant domestic fittings have been readily available in the UK, compared with the many lantern types available via supermarkets or electrical wholesalers. A list of potentially-compliant fittings has now been compiled however, as AONB Good Practice Note 7b (see Appendix B1). This will provide a first step in promoting improvements for local communities and individual members of the public, as well as developers.

The cost of full replacement of exterior fittings will be high, involving both new fittings and installation by electricians. The replacement of old lamps with shielded options therefore seems to be the best and most economical solution for many existing domestic situations and this will be pursued.

Where new fittings are being installed, either by individuals, or via housing development, AONB guidance and management will be required as common practice.

Appendix F.5 provides further detail of this preliminary investigation.

## 4. SUMMARY OF ACTIONS REQUIRED

We realise our proposal to establish a large core area of the proposed IDSR means we have set ourselves a significant task in achieving 90% and 100% compliance with IDA requirements for the core in 5 and 10 years respectively, after a period of provisional status to achieve 67% compliance. However, we believe the work undertaken and progress made so far has given us realistic experience and put us in a strong, if challenging, position to achieve these targets.

Section H (Future Plans and Commitments) sets out the targets and specific indicators we will establish to ensure we meet the full range of IDA objectives for an IDSR. Table F12 below highlights those targets and plans specific to meeting the targets for compliance with light fitting compliance.

When combined with the Wiltshire street light upgrade, we consider these will enable us to achieve the necessary compliance levels within the stipulated timeframes.

1.	Actively discuss and promote our policies for preserving dark night skies and reducing light pollution (Table F8) with the local planning authorities.
2.	Work with local authorities with the aim of achieving full compliance with dark sky policies (Table F8) in planning decisions, wherever possible.
3.	Promote and extend a dark-sky-friendly accreditation scheme with parishes, villages, farms, schools and businesses. Criteria will include dark-sky-friendly compliant lighting (Section H). We will provide information on suitable retro-fit and upgrade schemes that achieve compliance, including PIR.
4.	Provide part-funding to farms and agricultural businesses to upgrade and improve lighting.
5.	Work with farmers, including through the National Farmers' Union local representatives and the Police Rural Crime Team, to provide education on information about good, dark-sky-friendly lighting and how it benefits security (a key concern of the farming community).
6.	Continue to provide education and information for residents about good lighting practice, including developing practicable and economical alternatives.

▲ **Table F12:** Actions to meet the IDA requirements for light fittings and reducing light pollution.



# SECTION G

## WORKING WITH THE LOCAL COMMUNITY: OUTREACH AND EVENTS



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## SECTION G

# WORKING WITH THE LOCAL COMMUNITY: OUTREACH AND EVENTS

## SECTION SUMMARY

- People are at the heart of Cranborne Chase and its dark night skies.
- The AONB has been actively promoting the importance of dark night skies since 2004.
- We have run stargazing and dark night skies events for the local community in every year since 2014, and our first ever Star Fest in 2019.
- We have provided dark night skies seminars for community workers and planning professionals.
- We organised an astrophotography workshop, as an introduction on how to take wonderful night sky images.
- We have engaged with schools, parish and town councils, to explain the benefits of IDSR status and reducing light pollution.
- We have promoted our dark skies bid using a dedicated website (which went live in 2017), social media (Facebook, Twitter and Instagram), and a specially designed information leaflet.
- In February 2019 we invited local tourism businesses to attend astrotourism workshops.
- We have received letters of support (Appendix G.1).
- We have received over 800 responses to date supporting our Dark Sky Pledge.

**Relevant to IDA criteria:** E(A), E(D), M(F), M(G)

**Related appendices:** G.1 Letters of support; G.2 The AONB's top ten stargazing sites

*"We all need more galactic gateways.  
Fingers crossed for a successful bid."*

Feedback from Dark Sky Pledge responses.

Our communities, residents, visitors, farmers and local businesses are what gives the AONB its character, as much as its landscape and dark night skies. Their support and encouragement is fundamental to our IDSR application. This is not just because demonstration of support is a requirement of an IDSR application – though that is obviously important – but because the people who live and work in the AONB are emotionally invested in its landscape and culture. We have been constantly heartened and inspired by the encouragement and support we have received from many different quarters.

We have been engaging with people about dark night skies for several years, dating from even before we considered applying to be an IDSR (Table G1). These activities have involved a range of opportunities to marvel at the night sky, to educate and provide information about dark-sky-friendly lighting and the problems associated with light pollution, as well as recreational activities. This activity relies on the help of our brilliant and enthusiastic volunteers, as the AONB is not specifically funded to provide recreational opportunities.



Looking forward, we will continue to deliver stargazing events, promote good lighting practice – through engaging with parishes and businesses, schools, farmers, other residents and visitors – and deliver a dark-sky-friendly award scheme to support all those keen to work with us on reducing light pollution and preserving our dark skies. Section H gives more detail on our future communication plans.

▼ **Table G1:** A timeline of AONB commitments and activities promoting dark night skies and our IDSR application, from 2004 to 2019.

When	What	Who
April 2004	AONB publishes its Management Plan 2004–2009, including an objective to ‘ <i>support the protection of rural tranquillity, remoteness and dark night skies</i> ’.	Local planning authorities, planning teams, developers, parish councils, residents, community groups
June 2007	AONB publishes Dark Skies and Light Pollution Study commissioned from Entec UK Ltd. (see Section C).	AONB team, local planning authorities, residents and visitors
April 2008	AONB issues <b>Position Statement Number 1: Light Pollution</b> (see Annex B.1).	Local planning authorities, planning teams, developers, parish councils
April 2009	AONB publishes its Management Plan 2009–2014, which recognised the ‘dark night skies and tranquillity’ of Cranborne Chase AONB, as well as the continuing threats from development pressures.	Local planning authorities, planning teams, developers, parish councils, residents, community groups
2012 to 2013	The campaign ramps up! <ul style="list-style-type: none"> <li>• <b>AONB Director takes first dark sky meter readings.</b></li> <li>• Networking with other dark sky reserves (Brecon Beacons and Exmoor) and groups (British Astronomical Association, Commission for Dark Skies).</li> <li>• Meetings, presentations and discussions.</li> </ul>	Other dark sky reserves and places in the UK, astronomical associations, public, parishes, local authorities, community groups
January 2014	AONB Partnership Board receives a <b>presentation from Bob Mizon on dark night skies, and a planetarium show.</b>	AONB Partnership Board members (local authorities, conservation groups and associations)
April 2014	AONB Management Plan 2014–2019 promotes dark night skies and gives a formal statement of the AONB’s intention to apply to be an IDSR. The Plan stated: <i>‘We want to ensure the dark starry skies of much of the AONB continue to exist and are appreciated. Security lights, floodlights and some street lighting can break into the darkness, lighting up the surrounding area. Some of this light is necessary in order to keep people safe. However, inappropriate lighting can waste energy and reduce landscape quality.’</i>	Local planning authorities, planning teams, developers, parish councils, residents, community groups
May 2014	AONB Partnership Board has detailed discussion of dark night skies.	AONB Partnership Board members (local authorities, conservation groups and associations)
November 2014	AONB Planning Seminar (an annual day-long session run by the AONB for planning teams and other professional and community staff) was this year dedicated to the wonders of the AONB’s night sky. The seminar was on the theme of <b>‘Reaching for the Stars’</b> , and covered dark night skies, the planning aspects of reducing light pollution, and discussing our plans to apply to be an IDSR.	Local planning authorities, planning teams, parish councils, community groups



When	What	Who
Autumn 2014	Beginning of <b>systematic programme of dark sky meter readings</b> , engaging closely with the Wessex Astronomical Society.	Local astronomers and volunteers
Autumn 2015 to spring 2016	Five <b>stargazing evenings</b> , with presentations on dark night skies from Bob Mizon, and from the AONB on our IDSR bid.	Local residents and visitors
January 2016	AONB issues <b>Good Practice Note Number 7: Good External Lighting</b> (see Annex B.1).	Local planning authorities, planning teams, developers, parish councils
May 2016	AONB Annual Planning Seminar included presentations on <b>dark night skies and the benefits for tourism</b> .	Local authority planning staff, landscape consultants, countryside staff (including CPRE), parish councillors
Autumn 2016 to spring 2017	Three <b>stargazing evenings</b> , with presentations on dark night skies from Bob Mizon, and the AONB on our IDSR bid.	Local residents and visitors
March 2017	<b>Public meeting to discuss dark night skies</b> in Tisbury.	Local residents
March 2017	The AONB's <b>Annual Forum</b> ended with a presentation from Bob Mizon on dark night skies, followed by an evening of stargazing.	Over 80 people attended – members of the public and community representatives
March 2017	The AONB's top ten stargazing locations agreed with landowners and promoted to the public and visitors.	Local residents, visitors, and astronomy groups
March 2017	<b>Launch of Chasing Stars website</b> , dedicated to our bid and to sharing information about the glories of the night sky, stargazing, and good lighting practice.	Local residents, visitors, astronomers, parishes, farmers, schools...and more
August 2017	Larmer Tree Gardens <b>End of the Road Festival</b> – information on dark night skies and mobile planetarium.	Local residents and visitors
Autumn 2017 to Spring 2018	Six <b>stargazing evenings</b> , with presentations on dark night skies from Bob Mizon, and from the AONB on our IDSR bid.	Local residents and visitors
January to March 2018	<b>'Space Detectives' workshops</b> commissioned by the AONB held in schools, including virtual reality sessions: 'Our place in space', 'Blast off', 'The life of stars' and 'In the night sky'.	Five schools and one scouting group, with between two and five workshops provided for each
March 2018	<b>Astrophotography evening workshop</b> , run by a professional astrophotographer.	Photography and night sky enthusiasts interested in learning about how to take images of the night sky
March 2018	The annual AONB Planning Seminar included presentations on dark night skies. The seminar was called: <b>'Dark Night Skies – Achieving Community Benefits'</b> . Attendees included Dr. Martin Morgan-Taylor, Duncan Wise, and Dr. Sean Beer from Bournemouth University.	Local authority planning staff, landscape consultants, countryside staff, parish councillors, academic staff
April 2018	AONB issues <b>Good Practice Note 7a: Recommendations for Dark-sky Compliant Lighting on New Builds and Refurbishments – a Developers' Guide</b> (see Annex B.1).	Local planning authorities, planning teams, developers, parish councils



When	What	Who
June 2018	First publication of our Chasing Stars with Cranborne Chase fold-out <b>information leaflet</b> , packed with facts and hints.	Shared widely across the AONB
August 2018	Larmer Tree Gardens <b>End of the Road Festival</b> – information on dark night skies and mobile planetarium.	Local residents and visitors, both adults and children
Autumn 2018 to Spring 2019	Four <b>stargazing evenings</b> , with presentations on dark night skies from Bob Mizon, and from the AONB on our IDSR bid.	Local residents and visitors
December 2018	AONB Partnership Board agreed the <b>sustainable development grant fund</b> should be focused on contributing to farmers and landowners wishing to upgrade their external lighting to compliant fittings.	Farmers and landowners (not yet publicised, but agreed as budget commitment)
November 2018 to March 2019	Four <b>stargazing evenings</b> , with presentations on dark night skies from Bob Mizon, and from the AONB on our IDSR bid.	Local residents and visitors
February 2019	<b>Our first ever weekend-long Star Fest.</b>	Local residents and visitors, schools, guiding and scouting groups
February 2019	<b>Astrotourism workshops</b> , run by Richard Darn of Dark Skies UK, aimed at local tourist businesses interested in promoting the AONB as a 'dark sky' destination.	Tourism businesses
March and April 2019	<b>'Space Detectives' workshops</b> commissioned and held in schools, including virtual reality sessions.	Two schools (with two workshop sessions each)
April 2019	The AONB's <b>2019–2024 Management Plan</b> includes a chapter dedicated to Dark Night Skies, which is attached as a separate Appendix to this application (H.1), and a detailed presentation of our commitment to dark night skies.	Local planning authorities, planning teams, developers, parish councils, residents, community groups
April 2019	A meeting was held with the <b>National Farmers' Union (NFU) representatives for Wiltshire and Dorset</b> , and included a specific and positive discussion about how best to approach farmers to discuss good practice lighting.	National Farmers' Union – local representatives.
May 2019	AONB finalises <b>Good Practice Note 7b: Recommendations for Dark-Sky Compliant Lighting on New Builds and Refurbishments – a Developers' Guide</b> (see Annex B.1).	Local planning authorities, planning teams, developers, parish councils



## Chasing stars with the local community

As Table G1 shows, we have been working for many years to enthuse people about the wonders of our dark night skies, and to get across the message of why good quality, dark-sky-friendly lighting is so important. We have engaged with local residents and visitors, local and national astronomical associations, planning and landscape professionals, parish councils, academic staff, schools, guide and scout groups, farmers, tourist businesses, teams from other dark sky reserves, tourism businesses, local community groups and conservation organisations. We have been hugely fortunate in having the support of Bob Mizon of the Commission for Dark Skies and his colleagues from the Wessex Astronomical Society, who have helped us with events, stargazing and talks.

### **“Keep looking up!”**

Feedback from Dark Sky Pledge responses

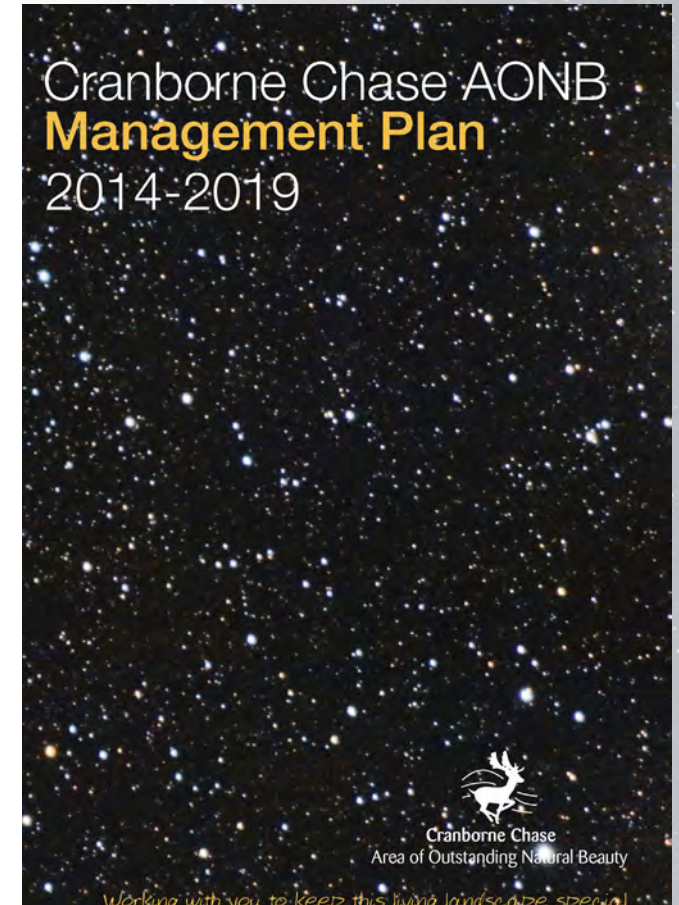
## Management and planning meetings and documents

### *AONB Management Plans*

The AONB is required to produce a Management Plan every five years (since 2004–2009). You can find more information on our Management Plans in Appendix B.1, but here we would like to stress these are not just formal documents. They are also an opportunity to promote our vision – for our landscape and our dark skies, our communities, residents and visitors – more widely.

***Low winter sun  
Elongated shadows  
Darkness falls  
Momentary blackness  
Until the first star rises  
Announcing  
The night’s sparkling constellation***

▲ Words by Ali Pretty, compiled from community workshop feedback, and quoted from the 2014–2019 Management Plan chapter on Living Landscapes



▲ Fig. G1: The AONB’s 2014–2019 Management Plan cover had a starry theme. It included the first formal statement of our intention to apply to be an IDSR.



## *Planning seminars and meetings*

The AONB holds an annual planning seminar. The aim is to reach out to planning professionals and local community groups to discuss issues of mutual interest and concern about our beautiful landscape, and how best to protect and enjoy it. Our starry night skies have featured regularly as an important theme. The 2014 seminar, called *Reaching for the Stars*, was dedicated to the dark skies of Cranborne Chase and the planning aspects of light pollution. The lighting consultant for Wiltshire Council attended this meeting and was inspired by what he heard and discussed – we like to think that may have played a part in influencing the major Wiltshire street lighting upgrade to be implemented over the next two years.

Our planning seminar in 2016 also included presentations and discussions about dark night skies, and the 2018 seminar – *Dark Night Skies – Achieving Community Benefits* – was themed around the topic once again, this time focussing on the benefits that reducing light pollution and promoting dark night skies can bring to the local community and its businesses. This gave us the opportunity to engage with professionals such as Dr. Martin Morgan-Taylor of the De Montfort University in Leicester, Duncan Wise from Northumberland National Park, and Dr. Sean Beer, Senior Lecturer in Tourism at Bournemouth University.

A public meeting – the Annual Forum – held in March 2017, was attended by over 80 members of the public. Bob Mizon gave a presentation on light pollution and dark night skies, followed by a much-enjoyed evening of stargazing.

## *The AONB Partnership Board*

The Partnership Board comprises an independent chair, and representatives from our constituent local authorities. It also includes representation from local and regional groups with an interest in our landscape, such as the National Farmers' Union, the Forestry Commission, the National Trust, Natural England, and other environmental groups. As such, it provides an important opportunity to engage with key stakeholders on issues that are important to the AONB, and we have presented to them regularly on our IDSR application. In 2014, Partnership Board members were treated to a presentation from Bob Mizon on dark night skies followed by a planetarium show. In November 2018, the Board showed its commitment by agreeing that a grant fund earmarked for sustainable development initiatives should be used to contribute to the costs of lighting upgrades by farmers and landowners.

## *Planning guidance*

The AONB has issued guidance on light pollution – in 2008, 2016, 2018, and 2019 – which is used to inform planning teams in the local authority, and also developers. In particular, the most recent guidance provides specific models as examples for developers of dark-sky-friendly light fittings. We produced this in order to make it easier for developers to source compliant lighting.



## Local astronomy groups

We work very closely with Wessex Astronomical Society, and are hugely grateful to them for their support, both for our events, and for our bid to be an IDSR. The Society recently awarded the AONB's Director and Dark Sky Advisor honorary membership, in recognition of this close working and ongoing relationship.



*Examples of WAS's support for us include:*

- Presenting and demonstrating at our stargazing evenings.
- Taking part in the Star Fest in February, including solar observing, mobile planetarium, and demonstrating Stellarium.
- Co-presenting at school assemblies and talks.
- Travelling the AONB taking SQM readings.
- Sharing astrophotographs with us.

We also have contact with and are grateful for the support of other local astronomy groups. They have written us letters of support for the IDSR application (Annex G.1), and we have visited Fordingbridge Astronomers, Martin Down astronomers, and the Sutton Very local group to share our plans. When arranging stargazing and other astronomy-themed events, we have over the years developed contacts with several different astronomy experts, and it is a delight to work with them. Their enthusiasm is infectious!

***"I hope one day everyone can enjoy the stunning beauty of a star filled sky. Where even easily recognisable constellations are hard to see amongst the stars that are rendered invisible by light pollution."***

Feedback from Dark Sky pledge responses.

## Stargazing – from 2015 and beyond

Our evening stargazing events have always proved hugely popular. There have been 18 stargazing events since 2015, in collaboration with Wessex Astronomical Society (WAS), plus an astrophotography workshop, with over 500 attendees over the entire series to date.



▲ **Fig. G2:** A typical flyer / poster for our stargazing evenings. Children go free, and the charge is a bargain £5 (including refreshments) for adults, as we want to encourage people to get involved.

Run at various locations around the AONB, we begin the evenings with a talk about our dark skies and, more recently, our IDSR application and why we think it is important. Then, Bob Mizon gives a



presentation demonstrating Stellarium, the interactive online astronomy programme, to reveal what is in the night sky, how to find the stars and planets, and the stories our ancestors wove around them in the constellations. Weather permitting, we then go outside for some stargazing.

However, cloudy skies and rain don't put us or visitors off – when the weather is poor for astronomy, we stay inside and the astronomers demonstrate their scopes, and there is the chance to get hands on with Stellarium and discuss the stars and night sky.

We will continue the programme of astronomy events in 2019/20 and future years (see Section H: Future Plans and Indicators). We are already being invited by local groups to arrange stargazing evenings in addition to those we arrange ourselves, so the word is spreading!

Stargazing events held by the AONB	
<b>2015</b>	November 9th, <b>Sixpenny Handley</b> December 10th, <b>Larmer Tree Gardens</b>
<b>2016</b>	February 8th, <b>Kingston Deverill</b> March 9th, <b>Charlton</b> , nr. Shaftesbury March 31st, <b>Ansty</b> October 21st, <b>Sixpenny Handley</b> December 13th, <b>Sixpenny Handley</b>
<b>2017</b>	January 31st, <b>Ansty</b> October 20th, <b>Charlton</b> , nr. Shaftesbury November 13th, <b>Semley</b> December 9th, <b>Sixpenny Handley</b>
<b>2018</b>	January 18th, <b>Bishopstone</b> February 15th, <b>Ansty</b> February 19th, <b>Sixpenny Handley</b> : photography workshop March 15th, <b>Sutton Veny</b> November 13th, <b>Ansty</b> December 13th, <b>Charlton</b> , nr. Shaftesbury
<b>2019</b>	January 29th, <b>Sixpenny Handley</b> February 22nd to 24th, <b>StarFest at Sixpenny Handley</b> March 22nd, <b>Brewham</b> (invited by local group)

Bob Mizon, with the mobile planetarium, and the AONB were also invited in 2017 and 2018 to attend a local music festival – the **End of the Road Festival**. Held in Larmer Tree Gardens in the heart of the AONB, this festival has a capacity of 16,000. While we may not have reached every one of those 16,000 people, there was certainly a great attendance at the planetarium sessions, and the chance to talk to adults and children about the stars, constellations and light pollution.

### *Star Fest February 2019*

In February 2019, we presented our first ever weekend-long Star Fest. Held in the heart of Cranborne Chase, in Sixpenny Handley, the clouds may have rolled over at night, but there were plenty of activities during the day and evening to keep everyone entertained. Jo Richardson of Space Detectives engaged youngsters and adults alike with her virtual reality space-themed workshops, including 'Aboard the International Space Station' and 'So You Want to be an Astronaut'; Bob Mizon showed the wonders of the night sky in his mobile planetarium; professional storyteller Lizzie Bryant wove magical stories of the stars, using the wonderful constellation shield she had created especially for the weekend; and photographer Paul Howell offered tips and advice on astrophotography, as well as displaying his beautiful images. There was also sun observing using solar scopes, galaxy-themed face painting,



children's activities, and lots of information on our bid to be an IDSR, good (and bad) lighting, and how to reduce light pollution. We will be arranging similar events in the future at least every two years.

### *Our top ten stargazing locations*

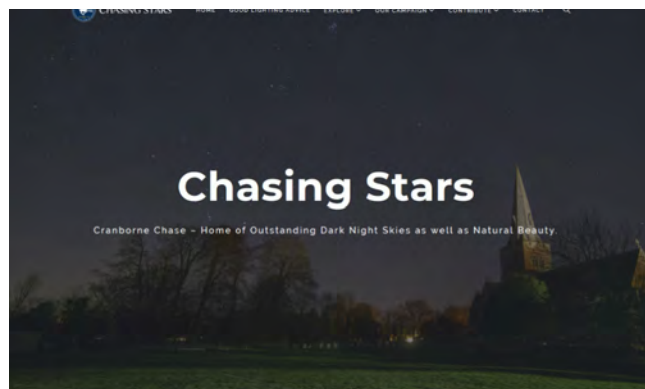
As well as organising events, we want residents and visitors to get outside and do their own marvelling at the night sky. To this end, we have identified ten different stargazing sites across the AONB. In each case, we have agreed access with the relevant landowners. Some of our events are run at the sites, but they are open to all to access at any time and enjoy star-filled skies. The full list of sites is described in Appendix G.2.

In promoting the sites, we explore not only their value for stargazing, but also their links to the long and rich cultural history of Cranborne Chase. We want to actively promote our dark night skies in the context of their place within the Chase's wide and varied landscape. This history ranges from King Alfred massing his troops against the Vikings, to prehistoric ceremonial landscapes, to ancient cattle droveways, to stately homes of England. UFOs even feature (tongue-in-cheek!) at Cley Hill, a top site for Britain's UFO spotters.

### *Chasing Stars online – website and social media*

Social media and the internet are hugely important tools when fostering interest in astronomy and dark night skies. A stunning photograph of the night sky can be as powerful as several paragraphs of text in grabbing attention and communicating why starry dark skies are both beautiful and achievable. When setting up the Chasing Stars website in 2017 – <http://www.chasingstars.org.uk> – we therefore designed a website that was visually compelling as well as being dedicated to promoting information about dark night skies and minimising light pollution:

The website aims to enthuse people to go out and do some astronomy, and provides information about dark-sky-friendly and compliant lighting, and why minimising light pollution provides so many different benefits.



▲ Fig. G3: The homepage of the Chasing Stars website.

As well as maintaining the website, we also have been cultivating social media (the AONB has Facebook, Instagram and Twitter profiles) to get our message across (Fig. G4 gives a few examples).

We have also actively sought out opportunities to use the local media (print and radio). Both the AONB Director for several years and, more recently, the Dark Sky Advisor have given interviews on local radio or in the local magazines, and Fig. G5 gives a flavour of these. As an example, the recent press interest in the CPRE's Orion survey resulted in calls from the local BBC radio station, giving us the opportunity to explain why it is so important to combat light pollution so more people can get to see truly dark skies. As we start to work more closely with other dark sky areas – for instance in supporting a 'Big Dipper' campaign in October 2018 – we anticipate further opportunities to get the messages across.

**Cranborne Chase AONB** @CranborneChase · Mar 13

Photo of amazing dark skies above Knowlton Church thanks to @PictorImages - local businesses can join an astrotourism workshop on 19,20,21 March to learn how to benefit from the stargazing market @EnglishHeritage @CranborneChase @RichDarn1 DM us or go to [chasingstars.org.uk](http://chasingstars.org.uk)

You Retweeted

**Cranborne Chase LT** @LandscapeTrust · Feb 22

At StarFest tonight at Sixpenny Handley & all weekend, see [chasingstars.org.uk](http://chasingstars.org.uk) with @CranborneChase

**Cranborne Chase AONB** @CranborneChase · 8 Oct 2018

Have you heard robins singing at night? And is urban light pollution behind it? Find out more in our first Dark Skies blog: [bit.ly/2BZOvDr](http://bit.ly/2BZOvDr) @Wiltswildlife @DorsetWildlife

**Cranborne Chase AONB** @CranborneChase · 29 Oct 2018

"Bye-bye dark sky" - here's an interesting read from the Natural History Museum in London. It's about the impacts of light pollution, and some things you can do about it: [bit.ly/2JoQWRr](http://bit.ly/2JoQWRr). If you take steps to make your...

**Bye-bye dark sky: is light pollution costing us more than just the n...**  
 What is light pollution and what impact is it having on British wildlife and ourselves?  
[nhm.ac.uk](http://nhm.ac.uk)

cranborne.chaseaonb  
King Alfred's Tower

local businesses in the area to take advantage of the stargazing market go to [www.chasingstars.org.uk](http://www.chasingstars.org.uk) for details, thanks to Paul @pictorimages for the amazing photos  
 #tuesdaymotivation #englishlandscape #nationaltrustsouthwest #someset #wiltshirelife #wiltshire #visitwiltshire #southwesttourism #folly

2w

ntstourhead Wow! What a spectacular shot! Thanks for sharing. Would Paul @pictorimages mind if we share and credit?

2w 1 like Reply

View replies (3)

Liked by metallipaul and 32 others

MARCH 12

Add a comment...

▲ Fig. G4: Examples from our Facebook, Twitter and Instagram feeds.





# Starry, starry night

**Star Fest is coming to Sixpenny Handley**

By Sarah Carridge

On a clear night, the dark skies are out of this world. They are filled with shining stars, constellations, and a growing popularity in stargazing. The South Downs National Park, with its Dark Sky Parks, is becoming a hub for stargazers. Star Fest is a festival that celebrates that night sky is coming to Sixpenny Handley between February 22 and 24. It is a planetarium experience for all ages, featuring a steellarium and stargazing with the...



## Why dark night skies are essential

The Cranborne Chase Area of Outstanding Natural Beauty (AONB) is currently applying to become a prestigious International Dark Sky Reserve. If this is successful, it would be the 13<sup>th</sup> such area in the world. It is the enormity of the sky that is so amazing in the Cranborne Chase AONB, said Carolee Wrayman, CCAONB board member when opening a special seminar, hosted by the Cranborne Chase AONB in Dorset Village Hall on 20 March, which focussed on the various benefits of dark night skies. These include improvements to human health, better conditions for wildlife as well as turning the area into a magnet for tourists, thus creating benefits for local businesses. Speakers at the seminar included Duncan Wise from the Northumberland National Park Authority and the lead officer on the joint collaboration with Kielder Water & Forest Park which secured International Dark Sky Park (Gold Tier) status. Duncan Wise said, "It's a game changer for rural tourism in Northumberland." Visitors making a beeline to attractions in the region are up 83% and the park has seen a huge spike in tourism in the previously quieter winter months. According to Duncan, wasted light in the UK costs an estimated £1bn. "The good news is that light pollution is reversible," he notes. Improving lighting isn't a case of turning everything off, but "ensuring that all outdoor lights are not too bright - avoid glaring blue-white LED lights and go for warmer white LEDs - and that they are fully shielded - so they shine downwards and avoid upward glare." Malcolm Happiness, a lighting expert, told the audience to confine lighting to the areas where it is needed, switch off when appropriate, control the light by a timer or detector and provide enough for the task but don't over-light. He said that lighting pointing across yards and sports fields can be among the worst polluters. Linda Nunn, director of the AONB, said the Cranborne Chase AONB is one of the darkest places in England and while the bid to become a Dark Sky Reserve is going well, "the road to Reserve status is going well, the compliance of domestic and business external lighting is currently low and something we are trying to address."

# Starry, Starry Night

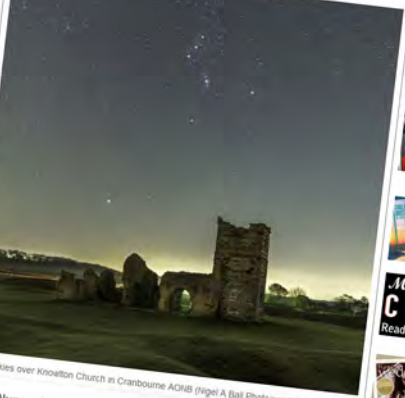
Linda Nunn, director of Cranborne AONB tells us about their bid to make this area of Dorset an International Dark Sky Reserve and the benefits it would have for stargazers and the local economy

PHOTO: Nigel A Ball



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## Cranborne AONB's bid to become an International Dark Sky Reserve



Linda Nunn, director of Cranborne AONB tells us about their bid to make this area of Dorset an International Dark Sky Reserve and the benefits it would have for stargazers and the local economy



Get regular updates directly to your inbox

What is a Dark Sky Reserve?

An area that has an exceptional quality of starry nights and nocturnal environment that is protected for its scientific, natural, educational, cultural, heritage and public enjoyment. Accreditation for this is awarded by the International Dark-Sky Association (IDA) based in the USA ([darksky.org](http://darksky.org)).

What Dark Sky Reserves are there in the UK?

Dark Night Sky Reserves, the highest level of award given, are Brecon Beacons National Park (NP) and Snowdonia NP in Wales and Exmoor NP and Forest Park, Northumberland NP and Kielder Water & Forest Park and some Dark Sky Communities.

Why is Cranborne AONB seeking Dark Sky status?

As 50% of this Area of Outstanding Natural Beauty (AONB) is above us, seeking for International Dark Sky Reserve status would conserve and enhance what we have. The Philips Dark Skies map shows a very dark area in central, southern England - it almost perfectly 'fits' the shape of Cranborne Chase (AONB). Bob Milzon MBE, who heads up the British Astronomical Association's Commission for Dark Skies, lives in Wimborne right on the edge of the AONB. He is helping us with our bid.

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▲ Fig. G5: A few examples of articles in the local media promoting our messages about dark skies and reducing light pollution.



**“A fantastic and timely ambition for this stunning AONB to have. thank you.”**

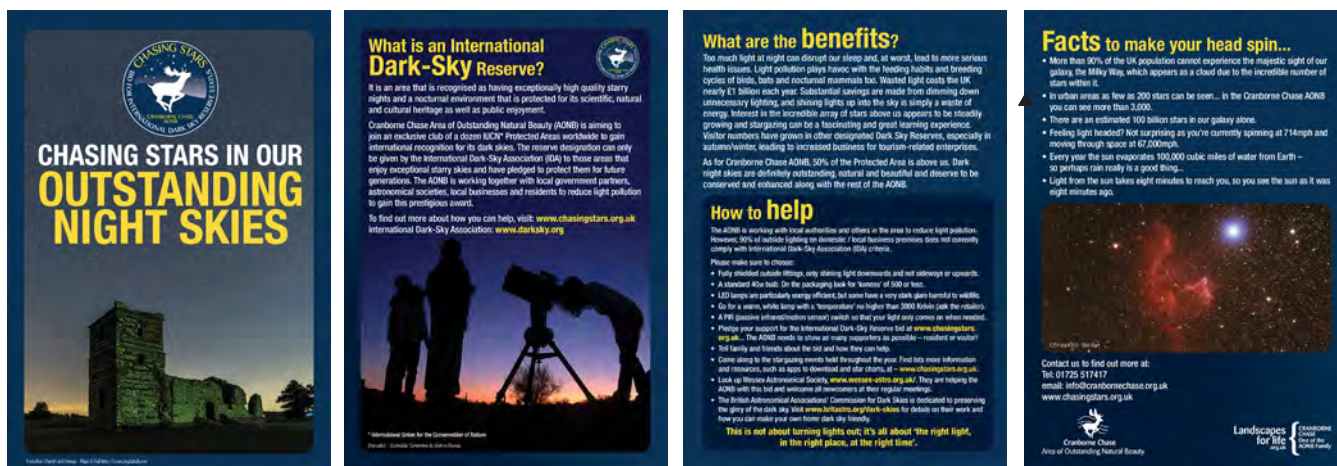
**“A precious resource – I’ve cycled across Cranborne Chase at night, and it was a rare and magical experience to have my way lit only by the moon for so long.”**

**“Thanks to the stargazing event I learnt a lot about what we have in the AONB, and of course astronomy. Will look out for future events like this one!”**

Feedback from Dark Sky Pledge responses

Print media is also important. To provide a simple way of promoting the messages we’d been talking about for several years, early in 2018 we pulled it all together in a leaflet packed with information (Fig. G6). This has proved very popular with parish councils and other groups.

We use it to explain why we are applying to be an IDSR, and promote our stargazing sites, some tips on stargazing and astronomy-related facts.



▲ Fig. G6: The AONB's Chasing Stars in our Outstanding Night Skies leaflet, produced in 2018.

## Engaging with our partners in the local community

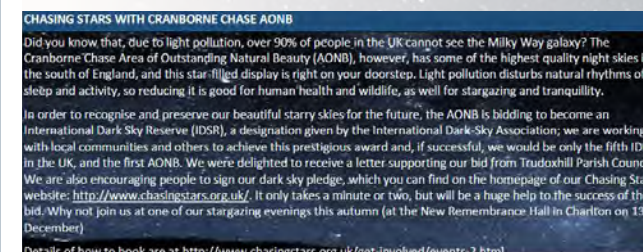
### Parish and town councils

There are 117 parish and town councils in or adjacent to the AONB (this number includes those that straddle or lie on the outer edge of the AONB boundary). Appendix B.1 explains how they fit into the local planning and administrative structures. We place great importance on active engagement with them. As an AONB, they are important in our activities and responsibilities, and we engage with them on many issues, from

supporting them as they develop Neighbourhood Development Plans, to talking to them about planning applications, to inviting them to events, and much more. This



◀ Fig. G7: Examples of Parish websites promoting dark skies and Cranborne Chase AONB's bid to be an IDSR



long-standing relationship means that they are always interested in discussing dark skies, and it has been encouraging how engaged they are. This year, as a follow up to this longer term engagement, the Dark Sky Advisor wrote to all parish and town councils, explaining progress with the application to be an IDSR, and offering to attend meetings and/or contribute to their local newsletters. She has since attended some meetings, and letters of support are included in Appendix G.1.

Parish meetings have been interesting and yielded informed questions – especially around the impact of IDSR status on planning applications (on which parish councils are consulted). It is clear that they and their residents hugely value their dark night skies. This is backed up anecdotally by comments received while doing the roadside survey of external lighting. When asked what we were doing, the response was variations on either or both of: *“I love our dark skies”*, and *“I always turn off my lights at night, so I can see the stars”*.

Several parish councils have included information about light pollution and dark skies on their websites (Fig. G7).

## Schools

As one attendee at a parish council said to us recently: *“Children are the future, and play a key role in influencing their parents.”* We agree, and have promoted dark skies and the messages about light pollution to all ages. Jo Richardson of Space Detectives (<http://spacedetectives.com/>) gave an AONB-funded series of interactive space / astronomy workshops in six schools / scout groups in 2018, and two more schools in 2019. With her exciting use of virtual reality, she engaged with the pupils about space and astronomy. Workshop topics included: ‘Our place in space’, ‘Blast off’, ‘The life of stars’ and ‘In the night sky’. Space Detectives also works on behalf of the National STEM<sup>20</sup> Learning Centre as an ESERO-UK<sup>21</sup> Space Ambassador for the South West of the UK.

Bob Mizon has also supported us for several years in schools across the AONB, often with the AONB team, and at events with his mobile planetarium. Bob is a master storyteller, spinning tales of the constellations for children and adults, and engaging them with the facts of the stars above our heads (or within his planetarium).

20 STEM is the acronym for Science, Technology, Engineering and Maths. The National STEM Learning Centre is based in York.

21 ESERO is the European Space Education Research Office



▲ Fig. G8: Hindon School enjoys some ‘space-themed’ virtual reality with Jo Richardson of Space Detectives, in 2018 (© Julie Harding).

At the Star Fest, we asked people to write down their answer to: **“What do dark skies mean for you?”**

Here’s a taster of some of the things they said:

**“Wildlife needs the night”**

**“The chance to wish upon a star”**

**“Beauty, peace and stillness”**

**“Thousands of stars”**

**“Mysterious skies that will last forever”**

**“To remind us how BIG the universe really is”**





## Local tourism businesses

As an AONB, one of our secondary objectives includes taking account of ‘...the economic and social needs of local communities’. A second objective is to ‘...meet the demand for recreation as far as this is consistent with the conservation and enhancement of natural beauty and the needs of agriculture, forestry and other uses.’

With this in mind, and with evidence from other dark sky areas that IDA accreditation has enhanced astrotourism into other areas of the UK, we decided to provide some training for local businesses. This is something we want to promote, irrespective of the outcome of our IDSR application.

In March 2019, we therefore held three workshops for local tourism businesses, led by Richard Darn of Dark Skies UK. The workshops – *Star Tips for Profit* – focussed on how businesses can operate and promote themselves as dark sky friendly tourist businesses.

Held in three locations to capture as wide an area as possible, each workshop covered:

- Why dark skies are important, and the problem of light pollution.
- What the various dark sky designations mean.
- What astrotourism is and how businesses are benefitting.
- How to make a business dark sky friendly.
- What equipment to provide.
- Useful apps and aids to observing.
- A crash course in stargazing.

***“Running a B&B we get lots of guests from the cities, and they all comment on how beautiful the night skies are. Many sit in the garden into the small hours looking at the stars!”***

Feedback from Dark Sky Pledge responses



**Star Tips for Profit** ★  
**Astrotourism workshops for local businesses**  
**19, 20 and 21 March 2019**

 Do you run a tourism business in or near Cranborne Chase AONB?  
**What is astrotourism? How could it benefit your business?**

The business workshops will be led by astrotourism expert Richard Darn. The workshop will be repeated on three consecutive evenings (7–9 pm):

- **Tuesday 19 March 2019:** Chalke Valley Stores (The Hub), High Road, **Broad Chalke**, Wiltshire SP5 5EH
- **Wednesday 20 March 2019:** Royal Chase Hotel, Shaftesbury, Dorset SP7 8DB
- **Thursday 21 March:** Hall & Woodhouse Visitor Centre, Bournemouth Road, **Blandford** DT11 9LS

**Find out more:** Cost £7.50 (cheque or cash on the day). No need to book. Register your interest by emailing [info@cranbornechase.org.uk](mailto:info@cranbornechase.org.uk) or phoning 01725 517417—or just turn up: all welcome!

▲ **Fig. G9:** Flyer advertising the astrotourism workshops.

## Farmers

With 86% of the AONB being dedicated to farming, and a further 10% to forestry, the rural land industry is clearly an important target audience for our messages about dark skies and reducing light pollution. Farming is incredibly important to the AONB's landscape. We are fortunate to have built up excellent relationships with many farmers across our area through our Farm Conservation Project, led by the AONB's Farmland Advisor. Under this initiative, which started as the South West Farmland Bird Project in 2009, groups of neighbouring farmers work collaboratively in 'clusters' to discuss and carry out environmental work at a larger scale than is possible when focussing on individual farms. An increasing number of farms are now participating in this scheme.

We have recently begun to discuss dark skies and dark sky friendly lighting with farmers through these clusters, and they are showing interest. Many farmers have now diversified, adding bed and breakfast / guest house accommodation or camping activities to the rest of their business. We can therefore also talk to them in the context of astrotourism. We will be taking this forward through 2019.

We have also recently made approaches through a local branch of the National Farmers' Union, in April 2019, building on the excellent engagement enjoyed for over ten years.

See Sections F and H for more information on how we plan to engage with the farming community.

### 'Dark Sky Friendly' award scheme

We are going to launch a dark sky friendly award scheme in 2019, aimed at recognising different categories – farms, tourism businesses, parishes, villages, and schools – who achieve certain minimum criteria. See Section H for a fuller description of the proposed scheme.

### *What next?*

Over the last few years, we have been promoting our dark skies messages through our established network of relationships across the AONB. If we are successful in our IDSR application, and even if we are not, the story will not end there. Section H sets out our overall plans and targets for the next ten years. Here are highlights of those relating to continuing our public engagement strategy:

- We will launch a dark sky friendly award scheme in 2019. The scheme will be open to parishes, villages, schools, farms, and businesses, and will include the nomination of Dark Sky Champions. We have set ourselves targets for how many of these will be awarded per year (see Section H).
- Astrotourism workshops will be held for tourism businesses at least every other year.
- We will hold at least four stargazing evenings per year (usually more), and a Star Fest at least every other year.
- We will continue to offer and provide talks, workshops and other events for schools (at least four per year).
- We will participate in national media campaigns, and initiate local news about dark skies.
- We will step up our discussions about light pollution, security lighting and dark night skies with the farming community.
- We want to have an operational Observatory within the AONB by 2024.

Section H sets out the specific targets we have set ourselves, as well as the potential risks to achieving them, and the action we will take to mitigate those risks.





**Our first ever Star Fest, 22 to 24 February 2019.**

▲ **Fig. G10:** Clockwise from top left: Star-themed face painting; arm painting; touring the ISS in virtual reality while dad looks on; Chewie investigates our proposed dark sky reserve plans; sunshine meant the chance to use a solar scope; tales of the stars with storyteller Lizzie Bryant and her shield of constellations.



# **SECTION H** SAFEGUARDING OUR DARK SKIES: FUTURE PLANS AND COMMITMENTS

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## SECTION H

# SAFEGUARDING OUR DARK SKIES: FUTURE PLANS AND COMMITMENTS

## SECTION SUMMARY

The AONB has included its future plans for safeguarding its dark skies in its 2019 to 2024 Management Plan. This plan is approved by the Secretary of State for the Environment, Food and Rural Affairs and adopted by the constituent local authorities.

Achieving IDSR status is a key aim of the Plan, because of the enhanced opportunity to engage the local community, parish councils and LPA partners. It also helps safeguard the AONB's dark night skies for future generations.

We have established a set of key indicators for monitoring our progress in taking forward dark sky objectives over the next ten years, aligned with our Management Plan and the IDA's own requirements.

The AONB will establish a Dark Sky Friendly accreditation scheme for local tourism and allied businesses.

We aim to establish an Observatory in the AONB within the five-year timeframe of the Plan.

**Relevant to IDA criteria:** M(C), M(D), M(F), M(G), M(I), M(J), M(K), M(L)

**Related appendices:** H.1 Extract from the AONB Management Plan 2019 to 2024: Dark Night Skies;  
H.2 Starry, Starry Nights Project Plan.

*"It [Cranborne Chase] is an area I love and visit and where one can truly see the night sky."*

Feedback from Dark Sky Pledge responses.



## Our dark sky objectives, policies, indicators and risk analysis

The AONB's previous Management Plan, for 2014 to 2019, included our commitment to applying for IDSR status. The new Management Plan, covering the period from 2019 to 2024, now includes a set of objectives related to dark skies, and policies designed to achieve them (Appendix H.1). In formally adopting the Plan, our partner local authorities have taken on board and accepted these objectives and policies as their own in operating their planning policies across Cranborne Chase AONB.

These objectives build on our achievements to date (the bullet points below are quoted from our most recent Management Plan):

- A Light Pollution Position Statement endorsed by AONB Partnership in 2008.
- An objective to seek International Dark Sky Reserve (IDSR) status was adopted by Partnership local authorities in the 2014-19 AONB Management Plan.
- The prevention and avoidance of light pollution has been consistently inputted to national and local planning policy consultations and detailed development management advice since 2008.
- The first specialist, dark night skies and good

lighting AONB Planning Seminar was held in 2014, another in 2018 whilst an AONB Annual Forum was held in association with the coordinator for the BAA's Commission for Dark Skies (CfDS).

- Good Lighting Guides were provided by the AONB and CfDS in 2016, plus a Developers' Guide to Good Lighting in 2018.
- Partnerships have been established with the British Astronomical Association (BAA) and Wessex Astronomical Society to record sky darkness, facilitate events, and promote good lighting practice. The Head of the British Astronomical Association's Commission for Dark Skies is giving wide ranging expert advice and support.
- 10 public stargazing sites have been negotiated with landowners and promoted through this 'Chasing Stars' initiative.
- Sky Quality Meter (SQM) readings have been taken throughout the AONB since 2015 and on a more systematic square kilometre grid basis during 2017 to map the darkest areas of the AONB.
- Numerous public stargazing evenings have been held together with 'Space Detectives' workshops delivered to schools.
- Some LPAs now regularly place conditions on planning approvals that ensure new lighting complies with this AONB's guidance, which

echoes CfDS and International Dark-Sky Association (IDA) best practice.

- A dedicated Dark Sky Advisor post from August 2018 will focus on the task of attaining Reserve status.

In preparing this application, we have taken the process a stage further by preparing a set of measurable indicators which we can use to monitor our progress towards achieving the objectives. We have also mapped the objectives and policies against the IDA's eligibility criteria and minimum requirements for IDSR status, as well as the requirements for longer-term achievements. We have ensured the indicators are as SMART – specific, measurable, achievable, relevant, timely – as possible, so they can be used to demonstrate progress in a quantifiable way.

## Landscape Partnership Scheme

The AONB has very recently (end March 2019) been successful in securing approval and funding for a Landscape Partnership Scheme (LPS)<sup>22</sup>. The Heritage Fund has awarded a grant of £1,676,000. Together with secured match funding and match-

<sup>22</sup> A Heritage Lottery Fund (HLF) grant programme for the conservation and enjoyment of areas of distinctive landscape character. The Landscape Partnership programme seeks to conserve the landscape heritage – both natural and cultural – in distinctive landscapes, at the same time delivering benefits for people within and beyond the areas covered by the scheme, in particular in terms of the way people understand, perceive and relate to the landscapes they live or work in, or visit. In so doing, LPSs create a holistic and balanced approach to the management of landscape heritage at a landscape scale, and help people to connect with it, thereby leading to continued activity and a lasting legacy.



in-kind, this equates to a total input of £2,675,000 over five years. A sum of £6,800 of this is targeted at dark sky related initiatives supporting volunteers to become Dark Sky Champions, and to act in determining their own local stargazing sites, and promote messages about dark sky friendly lighting (see Appendix H.2: 'Starry, Starry Nights Project Plan'). There will also be input from local astronomy groups, and astrotourism and education experts. The LPS does not cover the whole AONB, but the dark sky related plans will work alongside and support the whole-AONB plans set out in this IDSR application. The LPS plans include astrotourism training for businesses, school workshops and input to uniformed groups (e.g. scouts and guides) in achieving astronomy-related badges. Table H4 (Summary activity plan for years 1 to 10) includes some of these LPS plans alongside the whole-AONB plans.

These objectives and policies have been mapped to the IDA criteria, and our own project outputs and indicators identified, as follows, together with risks and risk mitigation, and an outline activity plan. We will be using this programme of targets to ensure we meet the IDA's targets. We will review and adjust these as part of the annual reporting process each year. The plans set out here relate to five and ten year targets (other than the LPS plans, which are part of a separately funded initiative).

Objective		Policies	
<b>DNS A</b>	International Dark-Sky Reserve (IDSR) status is secured for the AONB during 2019	<b>DNS1</b>	Actively promote the benefits of IDSR status to all partners and communities to elicit appropriate action and support for the application to IDA.
<b>DNS B</b>	The IDSR status is retained through evidencing annual reductions in light pollution across the AONB	<b>DNS2</b>	Work with all LPA partners to: <ul style="list-style-type: none"> <li>retain IDSR status through continuous improvements to lighting/retrofitting schemes</li> <li>embed good practice lighting guidance within their Local/Development Plans</li> <li>place good practice lighting conditions on all planning permissions</li> <li>submit an annual report of activities to maintain the IDSR status</li> </ul>
		<b>DNS3</b>	Support parish councils in promoting good practice lighting to their residents and businesses, offering Dark Sky Friendly Parish Award
		<b>DNS4</b>	Investigate the potential for sponsorship/provision of low cost good practice outside light fittings within the AONB
<b>DNS C</b>	The multiple benefits of dark night skies are understood, valued and enjoyed by all	<b>DNS5</b>	Work with other UK 'Dark Sky Places' and related organisations to improve awareness and understanding across the country of the need to reduce light pollution
<b>DNS D</b>	The AONB, tourism and related businesses jointly promote, and benefit from, the AONB as a prime destination for stargazing holidays	<b>DNS6</b>	Develop a Dark-Sky Friendly Accreditation Scheme for local tourism and allied businesses
<b>DNSE</b>	An AONB observatory offers regular stargazing activities together with educational and study opportunities for residents, visitors and schools	<b>DNS7</b>	Determine a potential location, design criteria and funding requirements necessary to establish an AONB Observatory within the timeframe of this Plan

▲ **Table H1:** Extract of the AONB's Management Plan 2019 to 2024, listing dark skies objectives and policies (see Appendix H.1 for the full Chapter).



▼ **Table H2:** The AONB's identified project outputs and indicators, mapped against the Management Plan Objectives and Policies, and the IDA criteria. These plans have been formulated to enable us to meet five and ten year targets, and will be reviewed annually.

AONB Management Plan Objective	AONB Management Plan Policy	IDA eligibility criteria (E) and minimum (M) requirements	Project output	Indicator	Year 1	Year 2	Year 3	Year 4	Year 5	Years 6 to 10	Total (if relevant)
Secure and maintain IDSR status	Promote benefits of IDSR status	M(H), M(M)	IDSR application submitted and status achieved and maintained.	Status reconfirmed each year	Submitted	Yes	Yes	Yes	Yes	Yes	
				Annual report submitted to IDSR by 1 October every year	Yes	Yes	Yes	Yes	Yes	Yes	
Annual reductions in light pollution	Work with local planning authorities to achieve good lighting conditions	E(C), E(E), M(A), M(B), M(C), M(D), M(E), M(F), M(K), M(L)	Good practice lighting conditions and guidance are a standard feature of planning application decisions.	% of planning application decisions related to external lighting that reference AONB and other guidance (e.g. IoLP, CfDS).	30%	50%	60%	75%	90%	100%	100%
				% of planning application decisions that specify good practice lighting conditions on planning permissions require planning authority approval	30%	50%	60%	75%	90%	100%	100%
			Sky quality measured annually by local astronomers and trained Dark Sky Champions. At least one third of field monitoring squares measured each year, on a rolling programme	Number of field monitoring squares measured each year	At least 44 squares	At least 44 squares	At least 44 squares	At least 44 squares	At least 44 squares	At least 44 squares	At least 44 squares
	Offer Dark Sky Friendly Parish Award	M(B), M(F)	There is an annual increase in number of Dark Sky Friendly Parishes and villages	Number of DSF parish and village awards added each year	Scheme promoted	1	2	3	3	15	24
			Each designated Dark Sky Friendly Parish and village has at least one Dark Sky Champion	Number of DSF champions added each year.	Scheme promoted	1	2	3	3	15	24
			There is an annual increase in number of Dark Sky Friendly Farms and Schools	Number of DSF schools and farms added each year.	Scheme promoted	1	2	3	3	15	24
Sponsorship of low cost dark sky friendly light fittings	M(F)	Sustainable Development funding contribution (or alternative sought) to lighting improvements made by farms and businesses	Numbers of farms/businesses receiving funding each year.	Funding agreed; available from Year 1	5	5	5	5	10	30	





AONB Management Plan Objective	AONB Management Plan Policy	IDA eligibility criteria (E) and minimum (M) requirements	Project output	Indicator	Year 1	Year 2	Year 3	Year 4	Year 5	Years 6 to 10	Total (if relevant)	
The benefits of dark night skies are understood, valued and enjoyed by all.	Work with other UK 'Dark Sky Places' and related organisations to improve awareness and understanding across the country of the need to reduce light pollution.	E(A), E(B), M(G), M(J)	Participate in and/or initiate national (and local) level campaigns, including collaboration with the newly formed Dark Sky Alliance.	Number of national campaigns involved in each year	1	1	1	1	1	5	10	
				Number of local press releases/media campaigns each year	5	5	5	5	5	25	50	
			Hold public stargazing events, including stargazing evenings and weekends, and events for schools and other groups.	Number of stargazing events per year.	4	4	4	4	4	4	20	40
				Number of major 'StarFest' events (Dark Sky/Astronomy-related festival)	1		1			1	2	5
				Number of school talks and events	4	4	4	4	4	4	20	40
The AONB and tourism businesses promote and benefit from the AONB as a prime destination for stargazing holidays.	Develop a Dark-Sky Friendly Accreditation Scheme for local tourism and allied businesses.	E(D), M(G), M(I)	There is an annual increase in businesses with Dark Sky Friendly status, with support from the AONB in providing training and information. There is an increase in the quantity of astrotourism-related business, as reported via a monitoring scheme.	Number of DSF tourism businesses added each year	Scheme promoted	5	5	5	5	10	30	
				Number of training workshops provided for tourism businesses	3		3		3	6	12	
				Tourism and allied businesses report annual increased astrotourism-related business (from Year 1 baseline)	Monitoring process established	5%	5%	5%	5%	10%	20%	
An AONB observatory is constructed	Determine location and design within lifetime of plan	E(D), M(G)	The observatory, after construction, will offer regular stargazing activities	Observatory built and operational by year 5.					Completed	Activities begin		



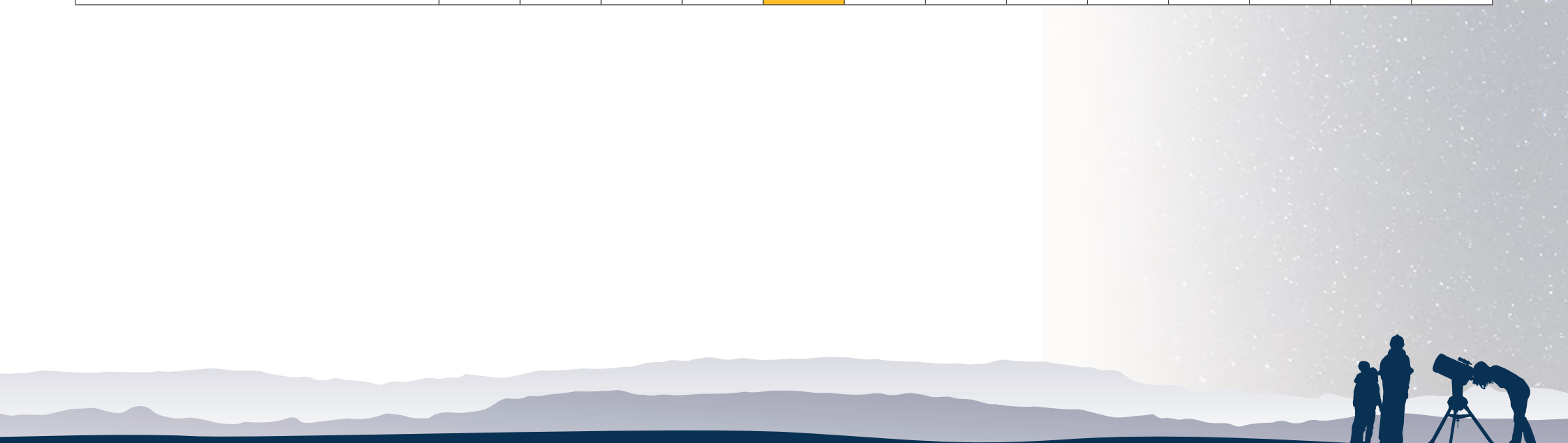
▼ **Table H3:** Main risks to achieving objectives, their likelihood and potential severity, and how the AONB would mitigate against the consequences of any risks realise (L, low; M, medium; H, high).

Risk	How likely	Severity	Consequence	Action
Local planning authority partners are not able to engage fully with ongoing efforts to reduce light pollution, because of other pressures and resource constraints	L	H	Improvements to external lighting in the AONB's core and periphery are slower to introduce, and IDA five and ten targets not met.	All local planning authority partners have shown increasing engagement with the AONB's dark skies initiative, and have endorsed the application for the AONB to be an IDSR as policy. The AONB will continue to invest time in discussions with the LPAs, and promoting dark sky friendly initiatives in policies and planning applications.
Lack of interest from parish communities	L	H	Effectiveness of ongoing programme work is reduced	Parish councils and local communities have been very engaged in the dark sky work. The AONB will continue to support them with advice, encouragement and support, through the dark sky friendly award scheme and in supporting events and training.
Lack of interest in astrotourism opportunities from tourism and related businesses	L	H	The positive effects of promoting the IDSR as an astrotourism destination are reduced.	Tourism businesses have already shown interest in the initiative, via initial training workshops organised. The AONB will continue to provide training and support, and will also establish a monitoring process to try and capture business gains as a result of the initiative.
Lack of attendance at events by residents and visitors.	L	H	Engagement with the local community and visitors is reduced.	Stargazing events over several years have continued to be well attended, especially given the support of Wessex Astronomical Society and the AONB's input. This will continue to be promoted.
Farms and schools do not engage with the initiative	L	H	Opportunities to engage with the wider community are reduced.	Talks and events for schools will continue to be offered, and have always been popular. We will continue early work to engage farmers. The well-established Farm Clusters provide a good basis for doing so.
A suitable location and funding for the observatory is not identified within the timescale of five years.	M	M	An opportunity to focus engagement and education is lost or delayed.	Work to identify a location and funding will begin as soon as possible, engaging in discussions with others such as local astronomy groups and landowners, as well as local residents and other groups.



▼ **Table H4:** Summary activity plan for years 1 to 10. Cells coloured blue are commitments relating to this Dark Sky Reserve application and cover the whole AONB. Cells coloured orange represent dark sky-related plans in the newly approved Landscape Partnership Scheme, which covers a part of the AONB.

Activity	2019				2020	2021	2022	2023	2024	2025	2026	2027	2028
	Q1	Q2	Q3	Q4									
Apply for IDSR status			Blue										
Launch Dark Sky Friendly Award schemes				Blue									
Dark sky events, including StarFest and planetarium shows.				Blue	Blue	Blue	Blue	Blue	Blue	Blue	Blue	Blue	Blue
SQM readings				Blue	Blue	Blue	Blue	Blue	Blue	Blue	Blue	Blue	Blue
Dark Sky Friendly Champion Training					Blue	Blue	Blue		Grey	Blue			
Training for tourism businesses	Blue				Orange	Blue		Blue	Grey	Blue		Blue	
Observatory commissioned and established									Blue				
School astro workshops and working with local uniformed groups.					Orange								



## Cranborne Chase AONB: Dark Sky Friendly award scheme

We will be launching a ‘Dark Sky Friendly’ award scheme later in 2019, aimed at rewarding initiatives to reduce light pollution taken by parishes, villages, tourism businesses, schools and farms. The aim is both to engage and harness the existing enthusiasm of the local community, and to continue to promote ongoing improvements to lighting across the AONB.

The table below sets out our proposed criteria for the various categories. Potential applicants will be recommended to first contact the AONB for an initial discussion, which will be an opportunity to go through the criteria and identify how we can support their efforts. We will actively encourage and support applications, and will provide advice and recommendations for action. Once a potential applicant is happy that the criteria are met, then they will complete an application form (to be prepared when the scheme is launched). A member of the AONB team will then arrange a visit to the site, and a decision will be made. If it is considered criteria are not sufficiently met, the AONB will provide advice on necessary steps – we want to support as many applicants as possible in achieving the designation. Hopefully, early discussions during the application process will mean applicants meet the criteria by the time of application. We have also decided to divide the Dark Sky Friendly Scheme for parishes and villages into Bronze, Silver and Gold Awards. This is to provide an accessible award scheme where multiple households are involved, while still encouraging a rigorous minimum level of compliance. We may consider additionally creating a Platinum category, for those who meet the IDA’s 2018 guidelines relating to all lights being fully shielded, even those below 500 lumens.

Successful applicants will be able to display a Cranborne Chase Dark Sky Friendly logo on their promotional literature and websites.

Who	Award	Eligibility	Qualifying criteria
Parish	Dark Sky Friendly Parish <ul style="list-style-type: none"> <li>Bronze</li> <li>Silver</li> <li>Gold</li> </ul>	Parishes either wholly or partially within Cranborne Chase AONB	<ul style="list-style-type: none"> <li><b>Bronze award:</b> External light fittings on 65% to 79% of domestic properties are either fully-shielded (i.e. no light above horizontal) and/or 500 lumens output or below, and on a motion-activated switch with maximum illumination of five minutes.</li> <li><b>Silver award:</b> External light fittings on 80% to 94% of domestic properties are either fully-shielded (i.e. no light above horizontal) and/or 500 lumens output or below, and on a motion-activated switch with maximum illumination of five minutes.</li> <li><b>Gold award:</b> External light fittings on 95% to 100% of domestic properties are either fully-shielded (i.e. no light above horizontal) and/or 500 lumens output or below, and on a motion-activated switch with maximum illumination of five minutes.</li> <li>Neighbourhood or parish plan includes specific commitment to valuing and promoting dark skies.</li> <li>Evidence that IDA-compliant lighting considered in responses when reviewing planning applications.</li> <li>Evidence of active engagement with non-domestic property owners (e.g. farms, schools, businesses) in the parish to encourage dark-sky-friendly lighting.</li> <li>Nomination of volunteer Parish Dark Sky Champion(s). The AONB will support this role with training and guidance.</li> </ul>



Who	Award	Eligibility	Qualifying criteria
<b>Village</b>	Dark Sky Friendly Village Bronze Silver Gold	Villages within Cranborne Chase AONB	<ul style="list-style-type: none"> <li>• <b>Bronze award:</b> External light fittings on 65% to 79% of domestic properties are either fully-shielded (i.e. no light above horizontal) and/or 500 lumens output or below, and on a motion-activated switch with maximum illumination of five minutes.</li> <li>• <b>Silver award:</b> External light fittings on 80% to 94% of domestic properties are either fully-shielded (i.e. no light above horizontal) and/or 500 lumens output or below, and on a motion-activated switch with maximum illumination of five minutes.</li> <li>• <b>Gold award:</b> External light fittings on 95% to 100% of domestic properties are either fully-shielded (i.e. no light above horizontal) and/or 500 lumens output or below, and on a motion-activated switch with maximum illumination of five minutes.</li> <li>• Village plan includes specific commitment to valuing and promoting dark skies.</li> <li>• Evidence of active engagement with non-domestic property owners (e.g. farms, schools, businesses) in the village to encourage dark-sky-friendly lighting.</li> <li>• Nomination of volunteer Village Dark Sky Champion(s). The AONB will support this role with training and guidance.</li> </ul>
<b>Tourism businesses</b>	Dark Sky Friendly Business	Tourism businesses either located in or operating in Cranborne Chase AONB	<ul style="list-style-type: none"> <li>• Evidence that light pollution on or near the property has been minimised, by ensuring all external light fittings are either fully-shielded (i.e. no light above horizontal) and/or 500 lumens output or below and/or on a motion-activated switch with maximum illumination of five minutes.</li> <li>• Information is provided to guests about stargazing in the area, including events, leaflets, and promoting stargazing on own social media and websites.</li> <li>• Providing for stargazing guests by, for example, making provision for late breakfasts and late returns in the night after astronomy activities, and making equipment available for loan, such as wellingtons, binoculars, star charts, astronomy guide books, and torches.</li> </ul>
<b>School</b>	Dark Sky Friendly School	Schools based in, or in the setting of Cranborne Chase AONB	<ul style="list-style-type: none"> <li>• Evidence that light pollution within the school grounds has been minimised, by ensuring all external light fittings are either fully-shielded (i.e. no light above horizontal) and/or 500 lumens output or below and/or on a motion-activated switch with maximum illumination of five minutes (subject to any health and safety or security considerations, to be agreed with the AONB).</li> <li>• Actively promote stargazing events and/or host a talk or presentation or astronomy/space-themed event at least once per year.</li> <li>• Evidence that pupils are engaged in understanding issues concerned with light pollution and how to reduce it (e.g. through an assembly or classroom activity).</li> </ul>
<b>Farms</b>	Dark Sky Friendly Farm	Farms based in, or in the setting of Cranborne Chase AONB	<ul style="list-style-type: none"> <li>• Evidence that light pollution within the farm grounds has been minimised, by ensuring all external light fittings are either fully-shielded (i.e. no light above horizontal) and/or 500 lumens output or below and/or on a motion-activated switch with maximum illumination of five minutes (subject to any health and safety or security considerations, to be agreed with the AONB).</li> </ul>



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