

EXMOOR National Park Dark Skies Guide

Your guide to getting
the most from Europe's
first International
Dark Sky Reserve



EXMOOR
NATIONAL PARK

Did You Know?

Light from the sun takes eight minutes to reach Exmoor here on planet Earth.

If the sun was the same size as the dot on this letter 'i', then the next nearest star would be ten miles away.

If you could travel at the speed of light (186,000 miles per second) it would take 100,000 years to cross our galaxy, the Milky Way.

Here on Exmoor you are spinning at around 714 mph as the Earth turns. At the same time you are travelling at 67,000 mph as our planet orbits the sun.

Even on the clearest night on Exmoor, the human eye can only see about 3000 stars. There are an estimated 100,000,000,000 stars in our galaxy alone!

The atmosphere on Earth is proportionately thinner than the skin on an apple

**For
thousands**

of years, man

has looked upwards

at the night sky and

wondered at what he saw.

This wonder helped to define

our sense of who we are, our

myths and legends, our religious

beliefs and our sense of our place in a

wider cosmos. But the dark skies that

were the night time backdrop for the

vast majority of human history are for many of

us now a rare sight. Our night times are filled

with the orange glow of street lighting and we are

all more likely to be looking at the television than looking

at the stars. So why not take the time on Exmoor to look up and

rediscover your sense of wonder.

Three things to find for beginners.

There are almost limitless stars, planets, constellations, galaxies, meteors and other objects to discover - but here are three of the most easily recognised features to get you started.

The Moon

The moon, Earth's only natural satellite and the second brightest object in our sky after the sun is a mere 384,400 km away and has fascinated mankind since the dawn of time. Known as Luna to the Romans and Selene to the ancient Greeks, the moon was often considered a female force in contrast to the masculine sun. The gravitational pull of the moon draws the oceans' water towards it and influences our twice daily tides. Our months are based around the approx 28 day cycles of the moon's phases. The moon makes an ideal starting point for astronomy as even fairly basic binoculars will soon reveal the surface pockmarked by millions of years of meteorite impacts

Orion - The Hunter

Orion is perhaps the most easy constellation to recognise in the winter skies of the Northern Hemisphere and is visible above Exmoor between November and February. Named after a great hunter from Greek mythology, he is usually represented with a belt formed by the three prominent stars - Alnitak, Alnilam and Mintaka, along with a raised sword and a shield. Orion is very useful as an aid to finding other stars. For example, by extending the line of his belt south eastwards you can find Sirius, the brightest star in the night sky.

The Plough

Also known as the Big Dipper, due to its resemblance to a large ladle, the Plough has been recognised as a feature in the night sky by different cultures around the world for countless years and is referred to as The "Seven Stars" in the Bible and "The Bear" in Homer's Illiad. The Plough is not in itself an official constellation but rather the brightest seven stars of the constellation Ursa Major or Great Bear. Like Orion, the Plough, visible all year round in the Northern Hemisphere, is very useful for navigating the night sky.

Great Orion Nebula M42 taken by Paul Jeanes from his observatory in Washford "under the darkest skies."

EXMOOR

Europe's First International Dark Sky Reserve

Exmoor National Park is recognised as one of the finest landscapes in the UK. Its deep valleys, high cliffs, wide open moorlands and clear streams provide inspiration and enjoyment to both locals and visitors. What is less well known is that Exmoor is also an amazing place to marvel at the wonders of the night sky and one of the few places in England where low levels of light pollution allow us to experience night skies that have sadly disappeared from much of the country.

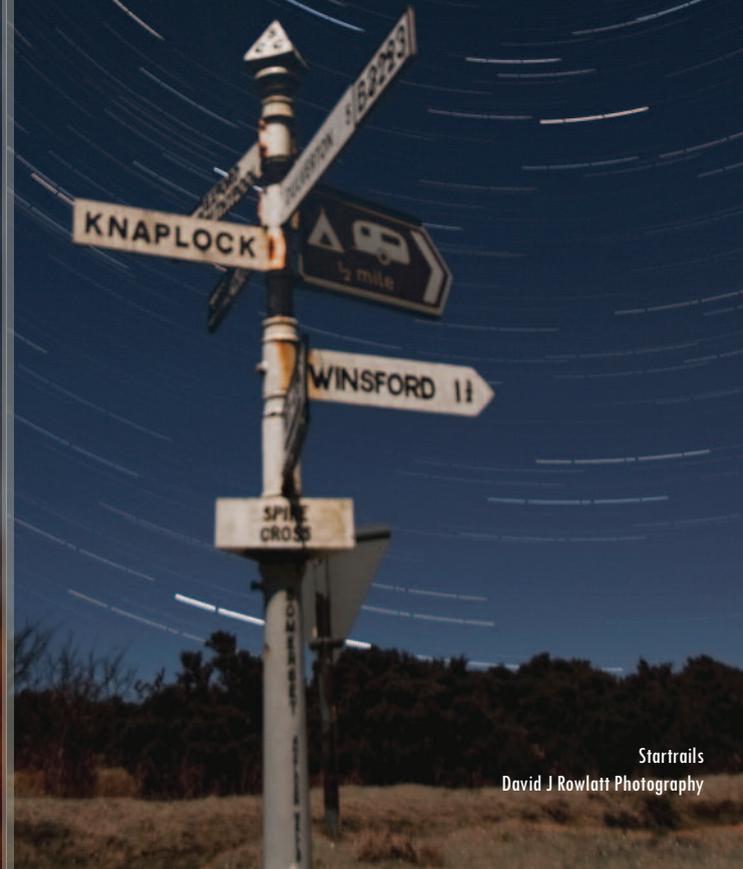
In recognition of our dark skies and the work we are doing to keep them that way and help people enjoy them, Exmoor National Park was designated Europe's first International Dark Sky Reserve in Autumn 2011 by the International Dark Sky Association.



Stag with Moon
mikesherwinphotography.co.uk

What is a Dark Sky Reserve?

Dark Sky Reserves are places that have exceptionally starry skies and have made a commitment to work to protect them. Exmoor National Park Authority, Devon and Somerset County Councils, landowners, businesses, individuals and communities within Exmoor have all worked together to reduce light pollution and are continuing to work together to keep our nights dark and full of stars.



Startrails
David J Rowlatt Photography

What is Light Pollution?

The term "light pollution" refers to the adverse effect of any artificial light on the environment. It is usually characterised by the orange "sky glow" that is produced above our towns and cities. This is caused by street lights and glare from lighting that spills beyond its intended lit area.

We all rely on artificial light to live our lives, but badly designed lighting wastes energy, can disrupt wildlife and prevents us from enjoying our night skies. Here on Exmoor we are working together to make sure that lighting is well designed, efficient and does not affect our wonderful dark skies.

Why is it Bad for Wildlife?

All animals have evolved without the influence of artificial light, and many of them are nocturnal so they are only active during the hours of darkness.

Birds when migrating and insects such as moths use the moon and stars to navigate in ways that we do not yet fully understand; artificial light may confuse them and make this much harder.

When insects are attracted to artificial lights it may change how easy it is for species such as bats to feed on them. This affects the natural ecological balance.

Artificial light may also affect animals by disrupting their ability to differentiate between the hours of day and night leading to birds singing during the night under streetlights.



Links

If you would like to find out more about astronomy, then there are some great resources on the internet, here are just a few:

- www.darksky.org/
- www.darkskydiscovery.org.uk
- www.bbc.co.uk/science/space/
- astronomy.swin.edu.au/cosmos/
- www.nasa.gov/
- fourmilab.ch/earthview/vplanet.html
- fourmilab.ch/yoursky
- www.esa.int

Why not visit one of our three National Park Centres where you will find Planispheres and a range of books to help you get started:

Dulverton National Park Centre
7-9 Fore Street, Dulverton, TA22 9EX
Tel 01398 323841

Dunster National Park Centre
Dunster Steep, TA24 6SE
Tel 01643 821835

Lynmouth National Park Centre
Lyndale Car Park, Lynmouth
Tel 01598 752509

Interactive maps and other information are also on the dark skies page of our website:

www.exmoor-nationalpark.gov.uk/dark-skies

Barn owl photo courtesy of the Exmoor Owl & Hawk Centre, Allerford

Cover photo: A weathered tree with the starry night sky over Exmoor National Park by Ben Birchall

Top Tips for Stargazing on Exmoor

Stargazing is easy - just go outside on a clear night and look up. Wherever you are there will be something to see. However there are some things that you can do that will help to make your experience really special. We have put together some simple tips to help you get the best out of your stargazing.

When to go

Stargazing on Exmoor is an all year-round activity, and any clear night will provide plenty to see. The darker months provide longer nights and the chance for younger astronomers to enjoy some pre-bedtime observing. March and April can be particularly good months for observing in the UK, and late summer and autumn often provide the best chance of seeing a shooting star.

Before you go:

- Check the time of sunset, and aim to start observing at least an hour and a half later - to allow the sky to become properly dark.
- As beautiful as the moon is - the best time for seeing the stars is when the moon is not in the sky, as moonlight can make it harder to see the dimmer stars.

What do you need to get started?

- **Your eyes:** It's a really good idea to get familiar with the night sky just using your naked eyes. If you are ready to invest in binoculars or telescopes then get in touch with your local astronomical club or society for expert advice.
- **A red torch:** Your eyes can take up to ten minutes to fully adjust to the dark and enable your "night vision" to allow you the best views of the stars. During this time avoid looking at any bright lights. Red lights, such as a rear bike lamp, are much better at preserving your night vision than white lights.
- **Starcharts:** There are many different resources available that will show you what you are looking at - as the position of the stars and planets is constantly changing with time and location. These include simple star maps, planispheres that allow you to set the date, and even smart phone apps.

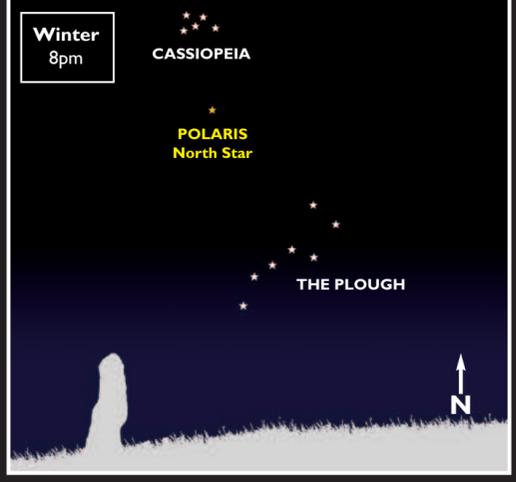
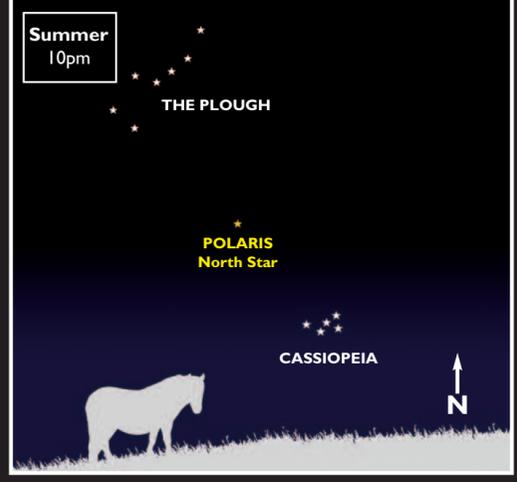
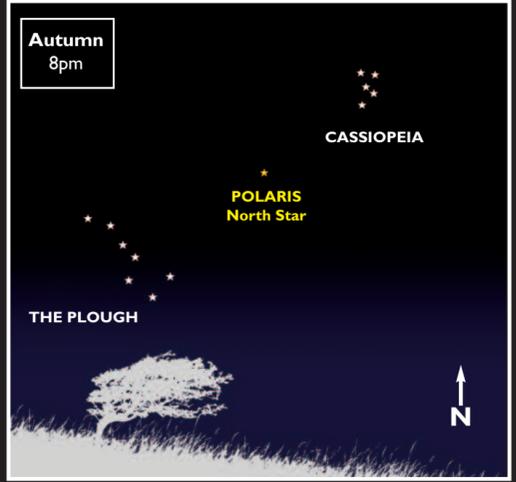
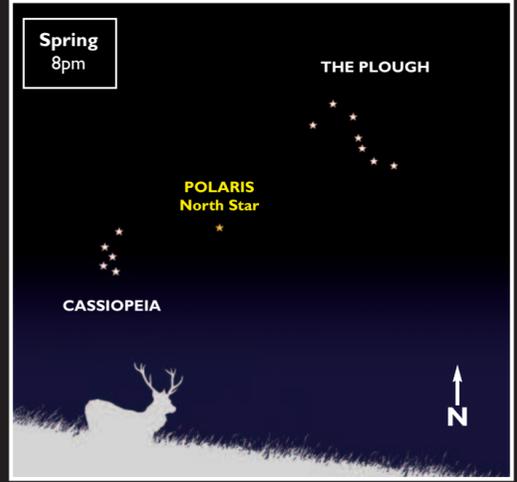
Use the starcharts on the right to get started. They show how the prominent features that you can see in the northern skies above Exmoor will look different throughout the year.

And don't forget that clear nights are often chilly - so wrap up warm and bring a hot drink.



An Exmoor stargazing event at Pinkery

Starcharts



How to use the Starcharts

Face the direction which you think is North and look up at the night sky, hold this page in front of you and find the starchart which relates to the present season.

The Plough (or Big Dipper), is the most easily recognised group of stars in the Northern sky, it is always above the horizon. The Plough is always the same shape but it appears to rotate throughout the year as the Earth progresses on its orbit.

No matter which way up it is you can always use The Plough to locate **Polaris** (which is also known as the North(ern) Star or Pole Star) which is the brightest star in the constellation Ursa Minor. Continue an imaginary line between the two stars, Merak and Dubhe that form the outer edge of the Plough's tip and travel five times that distance to locate the Pole Star. If you are facing North then the Pole Star should be directly in front of you.



Cassiopeia is easily recognised by its distinctive 'W' shape formed by five bright stars.

Dark skies above Westermill Farm near Exford by David J Southern

The night sky over Exmoor National Park by Ben Birchall

Where to go:

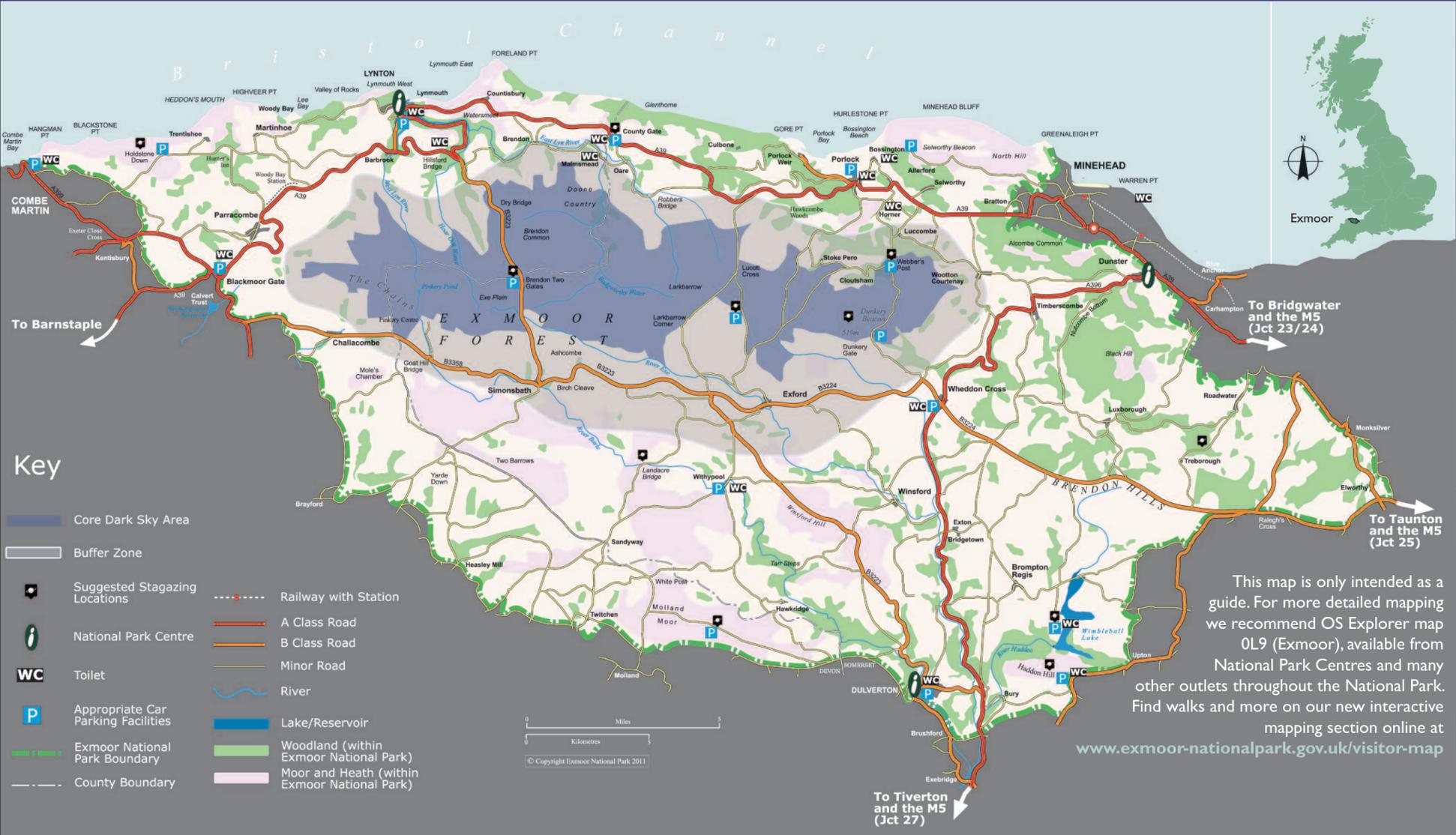
- Find a place that:
- Is away from the glare of direct lights
 - Is open to the public
 - Has good sight lines, without tall buildings or trees
 - Is safe, without hazards such as traffic or steep drops.

On the map you will find some places that we think are particularly good places on Exmoor to enjoy the night sky. Generally the further you are from illuminated built-up areas the darker the sky will be and the more stars you will be able to see.

In the centre of a city, where naked-eye observation is restricted by the effects of light pollution, as few as 200 stars may be visible. In a dark sky area like Exmoor, the dark adapted human eye would be able to see about 3000 stars!

What are Constellations and Asterisms?

Constellations, like Orion are groups of stars that appear to be distinctive or form patterns. They are useful in helping us find our way around the night sky and are often shown with imaginary lines that join stars and help to make their pattern clearer. Some constellations have been recognised since ancient times and many are associated with mythological figures. In 1925 the International Astronomical Union formalised the system of accepted constellations into the 88 that are now recognised. Some groups of stars such as The Plough are not official constellations but are still recognised as a group and are known as asterisms.



This map is only intended as a guide. For more detailed mapping we recommend OS Explorer map 0L9 (Exmoor), available from National Park Centres and many other outlets throughout the National Park. Find walks and more on our new interactive mapping section online at www.exmoor-nationalpark.gov.uk/visitor-map