

# DET HOTAGE NATTMORKRET (THE ENDANGERED DARK SKY)

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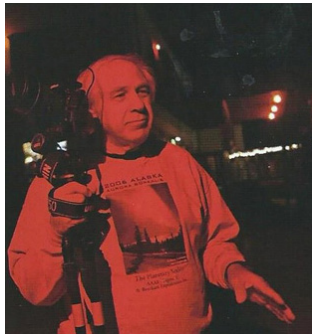
Translated by Betty och Kjell

F&F har besökt Borrego Springs i Kalifornien, som lockar stjärnskådnings-turister från hela världen.

Astronomer Dennis Mammana organizes Star Ready hikes in Borrego Springs, California. "All we are made of was created inside stars. Our roots are there. We must take care of them," he says.

A little more than 20 years ago the ground started to sway under the Los Angeles metropolis. The earthquake had caused a widespread power failure. That night when it got dark, frightened people called the authorities and reported that they saw a huge threatening silver cloud above the city. It was the first time they had seen the Milky Way.

According to the International Dark Sky Association, 80% of the population of the western world has never seen the Milky Way. The fact is that the starry sky becomes a more and more rare occurrence around the world. The light from street lamps, advertisements and cars make it impossible to see the stars even in a small town. The superfluous light, called light pollution, is a growing environmental problem as well.



Astronomer Dennis Mammana travels the world in search of the most spectacular night skies

People as well as animals risk being negatively affected by all artificial light sources at night. Christopher Kyba, of Germany's Research Center for Earth Science, has studied how nocturnal animals are affected by light pollution. According to him the night sky today is 100 and sometimes even 1000 times lighter than 200 years ago. He says that animals that live near cities or lighted areas find it more and more difficult to distinguish between day and night. Bats and other animals that hunt in the night and sleep in the day get their rhythm disturbed. Even birds become confused by the light. Research by Max Planck Institute for ornithology in Seewiesen, Germany shows that artificial light makes blue tits, great tits, blackbirds and robins start their dawn singing at an earlier time. Other studies show that the capacity for reproduction among fireflies is disturbed when they have to compete with electric lights.

The most well known example of the negative effects of the light pollution are sea turtles. Their eggs are hatched at night and even if it is pitch dark the young ones have been able to find their way to the sea supported by the wave foam that is reflected from the moon. Until now! Research at Florida Atlantic Uni-

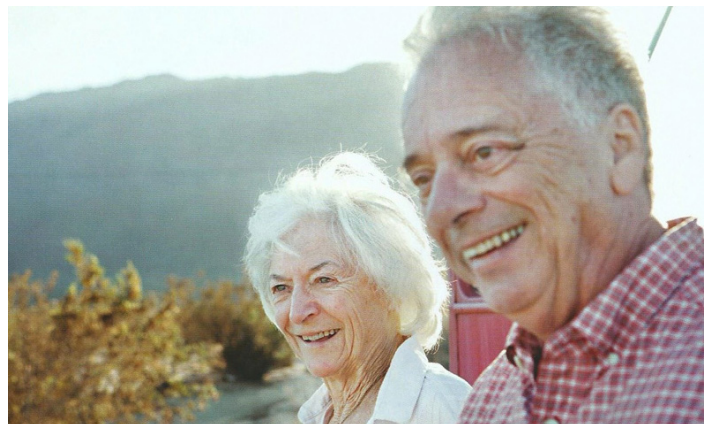
iversity in the United States and James Cook University in Australia, among others, shows that the bright lighting from hotel areas nearby lead the turtles into the wrong direction. Instead of crawling into the sea the small ones wander about and risk ending up as food for birds of prey.

Three hours drive from Los Angeles is the little desert town of Borrego Springs. The town is framed by mountains that force the rain to fall on the other side of them. That makes the climate in Borrego Springs sunny and warm the year around. The mountains also mean advantages at night. We arrived there on a starry night. About 50 people were listening to astronomer Dennis Mammana. It is star research festival. Astronomers, amateur astronomers and their families from different areas of the world came to Borrego Springs to talk about everything from eclipse of the sun to black holes. Everyone held a star map and Dennis Mammana showed different constellations. It was easy to understand why the inhabitants of Los Angeles described the Milky Way as a silver cloud. The belt of stars go across the sky and looks like a silver river. The more we watched it the more stars we saw. When we grew up we were taught that there were horses as well as bears in the sky. Many got frustrated when they didn't see them but the constellations require lots of fantasy. If you actually see a big bear up there something must be wrong with you, says Dennis Mammana. Both children and adults laughed. Dennis Mammana is used to being in front of a large audience regularly makes guided star tours to both tourists and amateur astronomers. It is not by chance that he is working in Borrego Springs. The conditions for star watching are perfect; the high mountains block the light pollution from Los Angeles, San Diego and other large cities nearby. The sunny weather gives the town more than 300 clear nights per year and the dry air improves the view even more.

Since 2009 the night sky in Borrego Springs is one of the few in the world that is protected by the International Dark Sky Association. That means that the sky must not be polluted

by unnecessary lighting. Both businesses and residents in Borrego Springs agree to use allowed (shielded) lamps that don't light up the night sky.

Dennis Mammana says that Borrego Springs attracted star tourists even before it was certified as an International Dark Sky Community. The town has been well known as an excellent place for star watching for many years. Now it also attracts people from other countries. Also, many of the animals in the area are dependant on the darkness. The vegetation consists of mostly sand and cactus and during the hot days mice and other animals hide under the ground. When it gets dark and cool they come out to hunt. Since the small animals are eaten by coyotes they are also awake in the night. The darkness works as an important protection for them.



Astronomer Dr. Jim Rickard and his wife Grace are active in preserving the night sky above Borrego Springs.

Some others who work actively to save Borrego Springs' night sky are the astronomer Jim Rickard and his wife Grace. They work to show that it is possible to light up as much as you want and are used to without disturbing the night sky. They regularly knock on doors to inform the neighbors exactly what kind of lamps are good to use. "It might be just putting a cover above the lamp. At the same time you should change the lamp into one with lower watts which will also save energy. We don't force anyone. We can just stimulate and inform people. We also distribute Night Sky Friendly certificates to all businesses who use right lighting. So far it has turned out very

well,” says Grace Rickard. She specifically mentions the RV park Holiday Homes as a good example. They originally had signs that were lighted up from below with lamps in the grass. Now the lighting is sitting on the top of the sign shining downwards.

In cities like Los Angeles and San Diego only a few stars can be seen. But in Borrego Springs there is no problem pointing out Cassiopeia, Orion and all other constellations every night. “Sometimes we forget that not everyone has that luxury. People coming from other places are shocked,” says Grace Rickard.

In the United States light pollution was seen as a problem years ago, even before the International Dark Sky Association was established in 1988.

Today more than 57 locations are protected by the International Dark Sky Association; Chile, New Zealand, France, Hungary, Namibia and South Korea are examples. 36 locations are in the United States. According to calculations by the International Energy Association, IEA, the American costs for light pollution are nearly ten billion dollars a year. In Sweden similar costs are estimated to be about two billion Swedish crowns.

The astronomer Marie Rådbo is one of the few Swedes who is concerned about light pollution. In Sweden urbanization has been rapid which has led to negative consequences. One hundred years ago 80% of Swedes lived in the country. Today 80% live in cities. Light pollution is still a rather unknown problem in Sweden. Marie Rådbo also thinks that knowledge of the star sky is lessening. “During some times of the year the planets are very bright. We have never known as much about the universe as we do now but have never had so many people who have never seen a full dark sky,” says Marie Rådbo. She lives in Gothenburg and says that she sometimes can see a few stars from her window. “Even in Stockholm you might be able to locate the Big Dipper sometimes. This does not mean that you have seen everything that the night sky has to offer. A full star sky takes your breath away. Everyone who sees it are amazed; others don’t know what they are missing.”

There is no lack of dark and lonely places in Sweden. Marie Rådbo is surprised that no one has profiled these areas as a star watchers’ paradise. In the mountains of Lappland, with hundreds of miles to the next town, the condi-

### **Five different kinds of protection criteria**

The International Dark Sky Association works to preserve and protect the star sky around the world. Anyone can apply to get his town, park or area certified as a Dark Sky location. To pass you have to comply with several different criteria, and this process often lasts for several years.

#### **International dark sky community**

A town where the residents and businesses work together to save the night sky by using smart lighting and actively work on educating the town.

#### **International dark sky park**

An official or private park with good lighting and a program for the visitors.

#### **International dark sky reserve**

A place with a dark area situated close to an inhabited region. In the inhabitant region there must be clear rules about how to save the darkness.

#### **International dark sky sanctuary**

The darkest of the dark. There are only two dark sky sanctuaries in the world, in Chile and New Mexico, USA.

#### **Dark sky development of distinction**

A way to bring attention to cities and towns working to save the natural night sky, but is not qualified as an International Dark Sky Community.

tions for star watching are even better than in Borrego Springs, which is surrounded by several big cities.

“Germany has concept hotels with names such as Bed and Telescope. It should be possible to have many hotels like that in Sweden. In Abisko Northern Lights tourism is popular. The tourists go home satisfied; even if they haven’t seen the Northern Lights they have seen fantastic star skies. They have never seen anything like it before. But we still haven’t done anything to protect our night sky,” says Marie Rådbo. But maybe things will be changing. Last year a motion was made in Parliament to limit unnecessary light. Some towns have started to investigate the possibilities of minimizing light pollutions. Marie Rådbo says that the problem is that nobody owns the sky. It is everybody’s responsibility. She wishes that light and light pollution were part of the education for architects and city planners.

Light designer Daniel Strömberg at ÅF Lighting agrees. He would like more cooperation between different professional groups. Studies show that lighting at night can be beneficial. Criminal activity is reduced in lighted areas. Research by the Norwegian Road Administration and the Transport Association show that fatal accidents at night are reduced by about 60% when the roads are well lighted. Daniel Strömberg says that areas can be well lighted when considering both people and the environment. An example is the Sölvesborg

bridge, a bridge for walking and bicycling that he and a colleague have constructed taking in to account the bird population.

“We have studied how they move and what they are sensitive to. Coloring and light level used are adjusted to them. We have also thought carefully about how the lamps are directed,” he says. “There are many examples of bad lighting but it is possible to use light to avoid light pollution. There are few people working competently with light. At the same time there is talk about smart towns, but it doesn’t seem especially smart to send light into the sky.”

In Borrego Springs they have a star watching festival. After a lecture the astronomers settle down in front of their telescopes. Coyotes howl in the distance and it is so dark that you can hardly see where to put your feet.

Dennis Mammana hopes that it will be as beautiful in the future but he admits that he is worried.

“The darkness is in danger. Every time the cities grow they send more light into the sky. I notice that the sky is getting lighter and most people think it doesn’t matter. I don’t know how to convince them but we have to try.”

— Dennis Mammana, Astronomer