

The RASC Dark Sky Program by Robert Dick (dick@starlight-theatre.ca)

Most of us have favourite observing sites. Some may be our backyard, not because it is dark but rather it is close and comfortable. Or, it may be far from urban sky glow - nested in the mountains of the west, or on rolling hills in the east. They may be at our family cottage or on the property of a friendly farmer. These areas are subject to the whims of neighbours' lighting. **[SIDE BAR: LP Starts at Home]** But there may now be a way to protect these sites from the encroachment of light pollution.

The RASC has developed an extensive program to help protect astronomy observing sites and wildlife sanctuaries from excessive outdoor lighting. The keys to this Program are limiting artificial illumination and public outreach.



The Sky of an Urban Backyard. Even with the glare from a neighbour's light, we can identify the major constellations.

Stargazers and astronomers across Canada have been working to reduce light pollution for several decades but a significant change began only 10 years ago.

With the experience of a few individuals, an effective light pollution abatement plan began to develop and non-polluting lighting fixtures became readily available.

Dr. Tom Bolton nurtured the first lighting bylaw in Canada to protect the skies around the David Dunlop Observatory north of Toronto. Robert Dick and Arnie Weeks of the Ottawa developed a plan to promote the reduction of light pollution in seven municipalities in the National Capital Region. Instead of mall displays and talking to neighbours, they approached the Mayors and city officials directly with safety, security and cost savings as the key.

Peter Goering of the Muskoka Heritage Foundation knew of a small provincial park in his area north of Toronto with a unique landscape and flora. At that time, most park agencies focused on the daytime environment. Goering's approach was to make them aware of the importance of the nighttime environment. The result was the world's first permanent Dark Sky Preserve – the Torrance Barrens. Canada now leads the world with six Dark Sky Preserves. **[SIDE BAR: Canadian DSPs]**

With the help of Dr. Tony Bidwell (Professor Emeritus at Queens University) our understanding of night was given a name. The new science of Scotobiology was born – the study of biology that “requires” darkness. With this new focus, research results could be consolidated under a single heading showing the importance of night in maintaining balance in the ecosystem (www.ecologyofthenight.org).

Park Agencies readily adopted the responsibility for the nocturnal environment, but what could they do to protect their park while permitting safe access for the public? They needed a fusion between the requirements of wildlife and practical lighting strategies.



Shielded Door Light. A cardboard shield coated with outdoor paint lets us use a 15-w bulb to light our steps.

With the support of Parks Canada, Robert Dick developed the rationale for the protection of the night environment that drew on scotobiology and developed a lighting protocol to satisfy personal safety yet minimized the impact of this lighting on the natural environment. This does not seem to address the needs of astronomy, but think again.

There are very few astronomers in Canada (see table). So, it is difficult to rationalize tax dollars being spent for a small minority if the population.

More people are concerned about wildlife than the stars. So the most effective argument for reducing light pollution is the protection of the natural environment. This is the

significance of the RASC Light Pollution Abatement Program. Protecting an area for wildlife, made it inherently better for astronomy. This approach garners support from other more established environmental organizations to help promote the idea.

The RASC has developed two criteria for their new Dark Sky Program: dark sites in rural settings (Dark Sky Preserve or DSP) and acceptable sites in urban settings (Urban Star Park or USP).

Common to both areas are lighting restrictions and public outreach programs to promote the reduction of light pollution by citizens and local municipalities. The outreach program educates homeowners, business and municipal officials to protect the site into the future. If you have a favourite observing site in your area, speak to the manager and discuss what can be done for it to be included in the growing list of Dark Sky Preserves and Urban Star Parks.

682 words

Table: Approximate Interest in Astronomy

600	Professional astronomers (CASCA)
4,000	Amateur astronomers (RASC)
40,000	Readers SkyNews Magazine
400,000	People with slight interest in astronomy (?)
34,000,000	Population of Canada (2007)

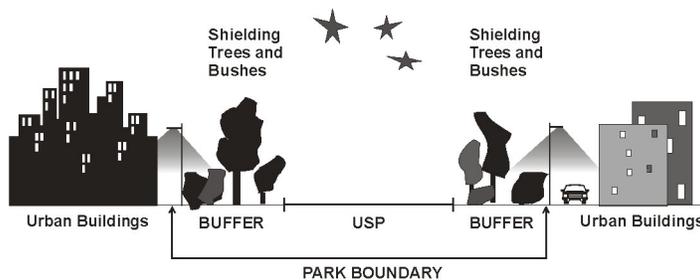
What makes a Good Dark Sky Preserve? People!

People create light pollution. And it is people who can help reduce it. People can identify potential Dark Sky Preserves (DSP) and Urban Star Parks (USP). And we would like people to visit these sites and enjoy the star filled skies.



A comparison between a sky of an urban site with shielded lighting and a really dark sky but with glare. Without glare, many stars can still be seen but under the darkest sky but with glare, few stars can be seen.

Not all dark sky parks are alike. They vary with sky brightness and accessibility, and the RASC feels these are both important. There are three key aspects of a DSP and an USP. First, it is important that park lighting does not detract from observing the sky. Second, we wish to promote the enjoyment of the night sky to the public. So, at least a portion of the park should be open to the public after dark when local astronomy groups can hold public star parties.



Graphic of an Urban Star Park. Boundary trees and bushes shield the USP from the glare of neighbouring lights.

And third, we would like visitors to take home an understanding of why we should protect our sky-based cultural heritage. This requires educating the public through some form of outreach program. In this way, we would like to see the DSP and USP Program become obsolete when we will again be able to see the Milky Way from our backyards and neighbourhood parks.

You can help establish a Dark Sky Preserve and Urban Star Park for your favourite area by speaking to the manager of the site. If it is already a nature preserve, you may find them happy to help. They may also embrace the idea that the public can enjoy the park after dark. Ask for a meeting so you can talk over the guidelines for DSPs and USPs from the RASC.

SIDEBARS

Light Pollution Starts at Home



Lighting in a Rural Hamlet. Even travelling to the country, you find glare. The light-dome of this hamlet is visible at a distance of 10 km. Common full cut-off fixtures can prevent this.

Look down your street late at night. If you live in a typical city, you will see streetlights, house lights, exterior store and business lighting amid darkened houses, and few if any people. Neighbours are in bed. Few people take advantage of this light.

Instead of turning on your all-night lights when you go to bed - keep them off. Light does not prevent crime. Security lighting puts private property on display for thieves and vandals. Indeed your light may simply highlight a new expensive car. A thief won't even need a flashlight and no one is awake to call the police when a crime occurs.



A simple curve of cardboard painted with durable outdoor paint can make this “no-see-um” light for a front door. You may also use the existing architecture to hide the light source from pedestrians or motorists.

Those new fluorescent bulbs that are being promoted for energy savings will work much better if their light is directed down onto your front door steps instead of into the eyes of visitors. A simple home craft for children (www.starlight-theatre.ca/LT-POLLUTION.HTM) can make these lights even more effective without adding glare to your streetscape. You will be surprised at how little light you actually need to make your property safe and secure.

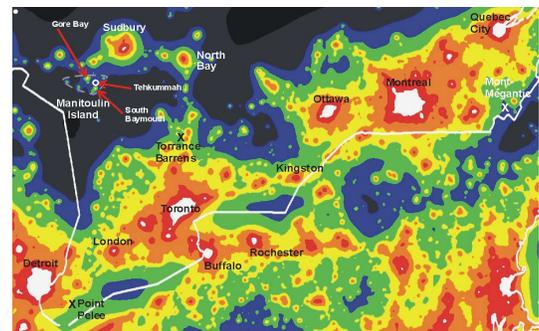
Canadian Dark Sky Preserves

The first seasonal Dark Sky Preserve (DSP) was established in the Lake Hudson Recreational Area near Clayton, Michigan. But in 1999, the first DSP in Canada and the first permanent DSP in the world was developed out of 1900 hectares the unique landscape of the Torrance Barrens north of Toronto. www.muskokaheritage.org/natural/torrancebarrens.asp).

Eastern Canada

Even a Google Earth image of the Torrance Barrens shows the glacier-scraped terrain to be unique. Its lack of surface soil restricts what vegetation can grow. Its dark skies are due to the lack of lighting within the Torrance Barrens Conservation Area and to the limited amount of light pollution from local towns.

Point Pelee is also a protected conservation area and a “Mecca” for birders – especially during migration



Four DSPs are labelled on this skyglow chart from P. Cinzano

season. Although its sky is not as dark as other DSPs, being relatively close to urban areas attracts visitors from one of the most densely populated areas of Canada. So, it is a great place for outreach programs that promote ecology and the reduction of light pollution.

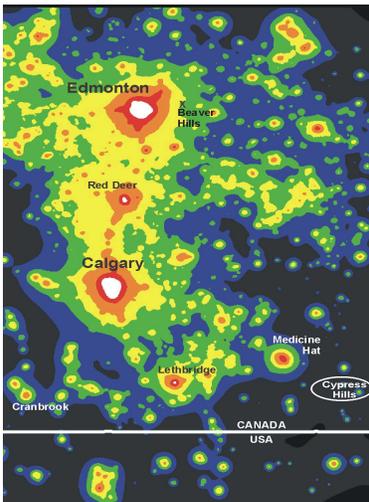


The unique dome design of the MMO is the centrepiece of the worlds largest DSP.

Mont-Mégantic is the largest DSP in the world (550,000 hectares) and was created to protect the dark skies surrounding the Mont-Mégantic Observatory [mmo.jpg] located over 100 km east of Montreal. The towns across the region have been re-lamping their streets to reduce the amount of roadway lighting that shines up into the sky.

And, business and homeowners are also shielding their outdoor lighting.

Western Canada



Two western DSPs are plotted on this skyglow chart (Cinzano). Although Skyglow may seem bad for Beaver Hills, it is still good for viewing the sky.

Three DSPs straddle the Rocky Mountains. Outside Abottsford BC is McDonald Park that is notable for its accessibility. Even though it is close to the city, the mountains shield the site from urban sky glow. Alberta is the home of the Cypress Hills and Beaver Hills DSPs. Cypress Hills Inter Provincial Park (39,000 hectares) is the home of the annual Saskatchewan Summer Star Party [homepage.usask.ca/~ges125/rasc/starparty.html]. Although the Beaver Hills site (157,200 hectares) [www.beaverhills.ab.ca/] is not as dark as Cypress Hills, it is much closer to,

by, city dwellers.