



PERCEPTION PLANNING
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Wairarapa Dark Sky Reserve

ISSUES AND OPTIONS REPORT

Prepared for South Wairarapa District Council

15 January 2020



Summary and Recommendations

- South Wairarapa District Council, along with Carterton and Masterton District Councils, is supporting an application by the Martinborough Dark Sky Society (MDSS) for the Wairarapa to be certified as an International Dark Sky Reserve by the International Dark Sky Association (IDA).
- An international dark sky reserve is an area of public or private land possessing an exceptional or distinguished quality of starry nights and nocturnal environment that is specifically protected for any one or more of the following: cultural, natural, educational, scientific or public purposes.
- There are 12 Dark Sky Reserves across the world. There is currently only one dark sky reserve in New Zealand located within the Mackenzie Valley, Aoraki. If the Wairarapa was to become a dark sky reserve, it would be the world's largest. There are also two dark sky Sanctuaries within New Zealand, being Stewart Island and Great Barrier Island¹.
- A Dark Sky Reserve certification has the potential to bring a number of positive benefits to the Wairarapa region including tourism (in particular winter tourism), cultural, environmental and educational benefits.
- Light pollution is the biggest threat to gaining certification, as light pollution hinders the ability for people to view the night sky. To qualify as a dark sky reserve, light pollution within the region must be controlled.
- The IDA has guidelines that a reserve must meet before it can gain certification. This includes restrictions on new lighting, requiring light shielding, limits on light levels/temperature and lighting times. There is therefore a need to control lighting within the district to a level that can satisfy the IDA guidelines.
- There are a number of options for the Wairarapa Councils to control light pollution within the District and these are outlined and assessed within Section 5 of this report.
- It is recommended that the Wairarapa Council's prepare a plan change to the Wairarapa Combined District Plan (WCDP) to amend the lighting controls contained within the plan. Amended provisions would ensure that new lighting

¹ A sanctuary differs from a Dark Sky Reserve in that it is typically situated in a very remote location with few (if any) nearby threats to the quality of its dark night skies.

complies with IDA guidelines within the dark sky reserve area, to reduced light pollution and adverse effects on the visibility, brightness and clarity of the night sky.

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1 Purpose

South Wairarapa District Council, along with Carterton and Masterton District Councils, are supporting an application by the Martinborough Dark Sky Society for the area of South Wairarapa and Carterton to be certified as an International Dark Sky Reserve.

Light pollution is the biggest threat to gaining certification, as light pollution hinders the ability for people to view the night sky. To qualify as an international dark sky reserve light pollution within the region must be controlled.

The purpose of this report is to provide;

- Background information on international dark sky reserves and the proposed Wairarapa Dark Sky reserve;
- Identify the resource management issues faced by the Councils associated with obtaining dark sky reserve certification; and
- Examine the options to address those issues available to the District Councils.

2 Background

2.1 What is a Dark Sky Reserve?

2.1.1 International Dark Sky Reserves

An international dark sky reserve is an area of public or private land possessing an exceptional or distinguished quality of starry nights and nocturnal environment that is specifically protected for cultural, natural, educational, scientific or public purposes².

The International Dark Sky Association (IDA) set up the International Dark Sky Places (IDSP) Program in 2001 to encourage communities, parks and protected areas around the world to preserve and protect dark sites through responsible lighting polices and public education.

There are 12 Dark Sky Reserves across the world with three in the southern hemisphere. There is currently only one dark sky reserve in New Zealand located within the Mackenzie Valley, Aoraki.

Dark Sky Reserves are not selected by the IDA but are nominated by a group and individuals from the community.

In order to be considered for dark sky reserve the area of land must be at least 700km² and consist of;

- a “core” area which meets minimum requirements for quality of sky and darkness;
- and

² <https://www.darksky.org>

- a “buffer” area which supports the core area’s dark sky values and receives similar benefits³.
- The ‘core’ and the ‘buffer’ collectively make up the ‘reserve.

Requirements for the quality of sky and darkness within the reserve include;

- Ability to see the milky way with the naked eye
- No artificial light sources within the vicinity that create significant glare

Light pollution is the biggest threat to the ability to view the night sky. Due to light pollution, the night sky over many of our urban environments can be brighter than a natural, starlit sky. This skyglow hides the stars from our sight and prevents us from experiencing a natural night, even in areas at a distance from urban development⁴.

The IDA provides a set of guidelines⁵ that must be achieved before dark sky reserve accreditation is gained. These guidelines include requirements for;

- A Lighting Management Plan (LMP) to ensure that a sufficient number of communities within the reserve area comply with the minimum lighting standards contained within the Lighting Management Plan Guidelines’. The Lighting Management Plan Guidelines outline minimum light shielding, light levels and timing, and guidance for illuminated signs.
- A program, either through education, economic incentives, permitting or regulation, to encourage all new outdoor lighting fixtures to conform to the relevant regulation or guidelines for night sky friendly lighting.
- Acknowledgement of the protected area by government or regulatory agencies. For example, the Councils demonstrating that dark skies are an important scientific, natural, cultural, and/or scenic resource value as shown by the inclusion of appropriate language in official documents for long term planning .

Councils therefore have a role in assisting the Dark Sky Society to achieve certification.

2.1.2 Wairarapa Dark Sky Reserve

The low light pollution levels in Wairarapa make it one of the best, easily accessible places in the world to view the night sky. This quality has been recognised by the Martinborough Dark Sky Society which has applied to the IDA for a large portion of Wairarapa to be formally recognised as an International Dark Sky Reserve.

³ <https://www.darksky.org/our-work/conservation/idsp/become-a-dark-sky-place/>

⁴ <https://www.darksky.org/light-pollution/measuring-light-pollution/>

⁵ International Dark Sky Reserve Program Guidelines June 2018 <https://www.darksky.org>

The International Dark Sky Reserve status would enable the Wairarapa to be actively marketed to domestic and international visitors looking to experience the night sky. The District Councils have recognised the large potential benefits associated with the dark sky reserve, and these are further identified within this report below.

The 'core' of the reserve is the Aorangi Forest Park and its surrounds.



Figure 1 - Proposed International Dark Sky Reserve - Source: Jarvis McDonald Group

A review of the current provisions of the Wairarapa Combined District Plan (WCDP) reveals that control lighting emissions within the district are not currently sufficiently specific to address the light emissions that impact on the view of the night sky, and do not meet the IDA guidelines. In particular, the provisions in the Plan do not control light shielding, light colour temperature, or identify areas within the Wairarapa where specific light emission controls are needed, or the times of day when light emissions require control.

The priority, in terms of the International Dark Sky Reserve accreditation process, is to ensure that light emissions/pollution from new lighting within the district can be controlled.

2.2 Benefits

Dark Sky Reserve certification has the potential to bring a number of positive benefits to the Wairarapa Region. These benefits are touched on below.

2.2.1 Tourism

Dark Sky Reserve certification has the ability to substantially boost tourism in the Wairarapa region and develop tourism over the quieter winter months.

Wairarapa is a well-established summer tourist destination, sought for wineries and cuisine. Tourist spending in Wairarapa during the 18/19 Summer averaged at 23 million, meanwhile average spending for 2019 winter averaged at 12 million. These statistics are almost identical to Aoraki before they became an internationally recognised Dark Sky Reserve. Once Aoraki became an accredited and established dark sky reserve winter tourism spending increased 41.8% (2010 vs 2019).⁶

Additionally, certification would protect the two existing dark sky tourism companies in Wairarapa (starfield and under the stars), as well as allowing other dark sky tourism companies establish themselves. The activity (stargazing) must take place at night which means that those visiting the area also need accommodation and are likely to partake in other tourist activities during the day-time, boosting tourist activity undertaken in the district.

2.2.2 Education

A dark sky reserve in Wairarapa will provide rare opportunity to educate tourists and locals of all ages about astronomy. For something that is above us every night so much of the population know so little about it. Currently 80% of the world cannot see the stars and live below light polluted skies⁷, a number that is only increasing as development and populations increase. Wairarapa has a unique opportunity to safeguard the night sky and educate people about historic uses for stars.

Local universities will be able to utilise the proposed dark sky reserve to support astrological related courses. Furthermore, local schools would be able to educate students about stargazing and the solar system.

2.2.3 Cultural benefits

Māori ancestors highly valued the night sky and possessed such great astronomical knowledge of their surrounding environment. Tātai Arorangi or astronomy was interwoven throughout Māori way of life and tohunga kōkorangi or master astronomers would observe the movements and positions of the stars, planets, comets and meteors and passed this knowledge through oral traditions like waiata, whakataukī, karakia and more.

The knowledge of the night sky was localised, the stars and planets were indicators of seasonal change, spawning migrational species and other environmental factors. The night sky highlights some important Māori values that have been detrimental to their livelihood and here are some key concepts (not limited) to Māori that signified the importance of the night sky; kaitiakitanga or guardianship, kōtahitanga or unity, whanaungatanga or sense of family connection, mātauranga and māramatanga or knowledge and insight, and many more.

⁶ <https://www.mbie.govt.nz/immigration-and-tourism/tourism-research-and-data/tourism-data-releases/monthly-regional-tourism-estimates/latest-update/monthly-tourism-spend-grouped-by-rto-and-product-category/>

⁷ Falchi, F., *et al* (2016) The new world atlas of artificial night sky brightness, *Science Advances* **2** (6)

The ability to view the night sky is integral to Māori in;

- Whakatere waka - Navigation
- Matariki - Pleiades
- Māramataka - Māori Lunar calendar
- Death

The night sky has been integral to the livelihood of Māori for hundreds of years, highlighting the great spiritual connection Māori have with the environment and without visible sky's this will challenge their livelihood.

2.2.4 Environment

The effects of light pollution on the environment has become increasingly researched and discussed over the past 10 years. As cities grow larger and brighter, night skies begin to become less visible. 56% of the country is unable to view the milky way. This figure is expected to significantly increase over the next 5-10 years based on the current rates of development across the country. Wairarapa has a rare opportunity to prevent further light pollution that is concurrent with population growth and development.

Plants and animals depend on Earth's daily cycle of light and dark rhythm to govern life-sustaining behaviours such as reproduction, nourishment, sleep and protection from predators. Scientific evidence suggests that artificial light at night has negative and deadly effects on many creatures including amphibians, birds, mammals, insects and plants⁸.

3 Statutory Framework

3.1 RMA

The purpose of the RMA is to promote the sustainable management of natural and physical resources. The principles of the Act are set out in sections 6, 7 and 8 as matters of national importance, other matters and the Treaty of Waitangi respectively. Differing levels of weight are given to these sections.

Section 6 identifies the following as matters of national importance. These matters must be recognised and provided for and include;

- (a) the preservation of the natural character of the coastal environment (including the coastal marine area), wetlands, and lakes and rivers and their margins, and the protection of them from inappropriate subdivision, use, and development

⁸ <https://www.darksky.org/light-pollution/wildlife/>

- (e) the relationship of Maori and their culture and traditions with their ancestral lands, water, sites, waahi tapu, and other taonga

Section 7 requires that the particular regard must be given to;

- (a) Kaitiakitanga;
- (aa) the ethic of stewardship;
- (b) The efficient use of natural and physical resources;
- (c) The maintenance and enhancement of amenity values;
- (d) Intrinsic values of ecosystems;
- (e) Maintenance and enhancement of the quality of the environment;

Section 8 requires that the principles of the Treaty of Waitangi (Te Tiriti o Waitangi) are taken into account.

3.2 NZCPS

The New Zealand Coastal Policy Statement (NZCPS) outlines how the purpose of the Act will be achieved in respect of the coastal environment.

Objective 2 of the NZCPS seeks to preserve that natural character of the coastal environment through recognising the characteristics and qualities that contribute to natural character. Objective 3 requires recognition for the role of tangata whenua as kaitiaki and provide for tangata whenua in involvement in the management of the coastal environment.

Policy 13 – Preservation of natural character – seeks to preserve the natural character of the coastal environment and to protect it from inappropriate use and development. Of particular relevance is that Policy 13(2)(e) recognises that natural character is not the same as natural features and landscape or amenity values and may include matters such as the natural darkness of the night sky.

3.3 Wellington Regional Policy Statement

The Wellington Regional Policy Statement (RPS) provides an overview of the resource management issues for the Wellington Region and policies and methods for the management of these issues.

The RPS contains objectives and policy to preserve and protect habitats and features, including natural character of the coastal environment (Objective 3, Policy 35). The RPS also contains objectives and policies that recognise the need for Council's to work with local iwi authorities for the benefit of the region.

3.4 Wairarapa Combined District Plan

The Wairarapa Combined District Plan (WCDP) applies across the three District Councils of the Wairarapa, namely Masterton, Carterton and South Wairarapa.

Lighting within each district is currently controlled by the provisions within the WCDP. The plan manages lighting through provisions within the 'general rules' of the Plan. These provisions apply to all outdoor lighting, regardless of activity / location across the districts.

The provisions relevant to the control of lighting within the districts are outlined below;

Chapter	Provision	Detail
Chapter 19: General Amenity Values	19.3.2 GAV1 Policies	(e) Manage the intensity, location and direction of artificial lighting to avoid light spill and glare onto adjoining sites and roads, and to protect the clarity and brightness of the night sky. Implemented through Method 19.3.4(a), 19.3.4(b) 19.3.4(c) and 19.3.4(g).
	19.3.4 Methods	(a) Performance standards for permitted activities to maintain general amenity values throughout the Wairarapa. (b) Assessment of environmental effects through the resource consent process for activities that do not comply with performance standards. (c) Conditions on resource consent to control adverse effects of activities. (g) Liaison with Road Controlling Authorities to promote the use of shields and other devices on streetlights to direct light downwards.
Chapter 21- General Rules	21.1.11 Glare and Artificial Light - Permitted Activity	(a) The emission of light (including glare) meets the following standard: (i) A maximum artificial light level of 8 lux (lumens per square metre) measured at 1.5m above ground level at the site boundary.
Chapter 22 - Assessment Criteria	22.1.17 Artificial Light	(i) The extent to which the light will adversely affect adjoining allotments. (ii) The impact of light direction on the safe and efficient operation of the road network. (iii) The extent to which the light(s) are necessary for reasons of security, public amenity, or safety.

		<p>(iv) The hours during which the lighting will operate.</p> <p>(v) Proposed methods to avoid, remedy or mitigate potential adverse effects including the height, orientation, angle, and shielding of the light source.</p>
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3.5 South Wairarapa District Council Annual Plan 2019/20

The South Wairarapa District Council Annual Plan for the 2019/20 year identifies in 'Projects/Issues' a plan change in partnership with the Martinborough Dark Sky Society to amend outdoor lighting permitted standards/rules within the District Plan to facilitate the development of a proposed Dark Sky Reserve within the Wairarapa⁹.

3.6 Carterton District Council Annual Plan 2019/20

The Carterton District Council Annual Plan supports the implementation of the Wairarapa Economic Development Strategy providing funding to contribute to projects.

3.7 Wairarapa Economic Development Strategy and Action Plan

The Wairarapa Economic Development Strategy and Action Plan identifies the 'Martinborough Dark Sky experience' as one of the four best 'multi-season, multi day regular returns' tourism opportunities in the district. The report identifies the opportunity for the Dark sky astronomy experience as an extension to Wellington tourism offer.

3.8 Draft South Wairarapa spatial plan

The purpose of the South Wairarapa Spatial Plan is to prepare the region for ongoing growth and to create a 'blueprint' for what the district will look like in time to come.

Within the South Wairarapa Spatial Plan Discussion Document¹⁰ - Shaping Move 1 recognises that the areas dark sky is internationally recognised and has the potential to become a large dark sky reserve. Proposed objectives seek to ensure the district's special qualities and character is 'nutured'¹¹ and guiding growth to achieve a tourism hub. The discussion document recognises the need to protect the dark sky reserve initiative from being compromised through inappropriate development.

⁹ South Wairarapa District Council Annual Plan for the 2019/20 year pg 14

¹⁰ South Wairarapa Spatial Plan – Our Future Focus 2050 – Discussion Document – How do you want South Wairarapa to look into the future.

The tourism hub is proposed to be a key role of the Wairarapa and includes wine, best food, dark sky reserve, gliding, bush, heritage, cultural initiatives, lake, wild coastline, trails with integrated education and employment.¹¹

One of the seven proposed special character projects for the region involves having the largest dark sky reserve in the world. While, one of the nine better connection projects is to promote joint educational initiative, including cultural astronomy/dark sky centre.¹¹

4 Consultation

This project is at its very initial stages, and as such there has been no consultation undertaken by the Council to the local community or interested stakeholder groups. The Council has however been open to its support of the Dark Sky Society's intention to gain International Dark Sky Reserve accreditation.

Discussion with the Martinborough Dark Sky Society have revealed that some initial discussions have been held with the Māori Standing Committee, Local Business Associations and Local Community Groups, however no formal consultation, or consultation plan has been established as yet.

It is recommended that consultation is started with the following groups as soon as possible.

- Local iwi;
- Māori Standing Committee;
- Department of Conservation (DOC);
- Minister for the Environment;
- Local Communities;
- Federated Farmers;
- Local Business Associations;
- Destination Wairarapa;
- Pukaha to Palliser
- Any other groups/individuals that may have a particular interest identified by the Dark Sky Society.

¹¹ South Wairarapa Spatial Plan Discussion Document. Retrieved from <http://www.swdc.govt.nz/sites/default/files/SouthWairarapaSpatialPlanDiscussionDocument.pdf>

It is recommended that consultation is undertaken by the Council in combination with the Dark Sky Society on a non-formal basis initially to get a feel for any concerns or queries that stakeholders may have. Any formal consultation (i.e by way of a Plan change process) can then be undertaken when required.

5 Issue and Outcomes

5.1 Issue

The information provided within this report above outlines the importance of the night sky within the Wairarapa and the benefits that would arise from the establishment of an international dark sky reserve.

There is also a clear direction from both higher order planning documents and from local strategic development documents to recognise that maintaining and enhancing the ability to view the night sky is important from both a resource management and regional economic development perspective. The night sky is identified within the NZCPS¹², and within the Councils' strategic documents and the District Plan as an important feature for the district that requires controls on activities to manage effects.

As outlined above one of the key criteria for achieving dark sky reserve status is that local authority needs to manage activities and any new outdoor lighting associated with those activities that has the potential cause light pollution that would undermine the dark sky qualities of the area.

The primary issue for the Wairarapa Councils to address is;

People need outdoor lighting to use buildings and spaces, however some lighting can cause adverse effects on the visibility, brightness and clarity of the night sky.

This issue recognises that outdoor lighting is important for way finding, identification of places, for public safety, and is essential to people's ability to use buildings and spaces.

This issue also identifies that lighting both individually and cumulatively can have an adverse effect on the ability to view the night sky.

5.2 Outcomes

To resolve the issue identified above the Wairarapa Councils need to be able to ensure that buildings and outdoor areas can be illuminated to provide legible, safe and functional facilities and spaces but in ways that minimise light pollution to levels that maintain the darkness of the night sky.

To address this issue the Councils needs to identify;

¹² Policy 13 – Preservation of Natural Character. Policy 13(2)(e) recognises the 'the natural darkness of the night sky' as a value of natural character.

- Light sources – the activities that cause lighting emissions; and
- Lighting type and characteristics – the types of lighting and characteristics (ie colour and temperature) of lighting that cause light pollution.

The Councils then need to consider the options for the management of these factors to avoid, mitigate and remedy light pollution within the District. Section 5 of this report ‘Options’ will identify the options available to the Councils to control lighting.

6 Options

6.1 Option 1 – Status Quo

This ‘do nothing/ maintain ‘status quo’ option would mean that lighting continues to be managed through the existing provisions in the WCDP.

Pros
No Plan change required.
No additional financial cost for implementation or compliance
Plan users (the general public, businesses, consultants and Council officers) are familiar with the Plan and how it works
Cons
Lighting control within the WCDP is primarily focused on the effects of lighting on the roading network and adjoining allotments rather than the night sky ¹³ .
The Plan has limited focus on managing lighting to protect the ability to view the night sky, The Plan limits lux levels of lighting. This is inefficient to manage light spill and light temperature that are the primary factors of light pollution. The provisions of the WCDP are currently unfit to resolve the issue.
Dark sky reserve accreditation would not be achieved for the District as it cannot confirm that the requirements to achieve accreditation can be met.

6.2 Option 2 – Bylaw

To control lighting within the district the Councils could develop a Bylaw/s under the Local Government Act 2002.

Under section 145 and s146 of the Local Government Act 2002, Councils can make bylaws for a number of purposes. These includes protecting the public from nuisance, for public

¹³ South Wairarapa Combined District Plan – 22.1.17 Artificial Light

health and safety reasons, offensive behaviour, and the management of infrastructure, reserves and recreational grounds.

Bylaws can be used as an alternative to setting rules in a district plan.

Pros
Bylaws have more limited rights of appeal and therefore provide greater certainty.
Bylaws would generally take less time than an RMA Plan change to develop and become operative.
Permit and penalty processes made under bylaws can be simpler than resource consent processes.
Cons
Given limited appeal rights there is less involvement in development of the provisions from the general public.
Bylaws are designed to control nuisance, being ‘ <i>a person, animal, thing, or circumstance causing unreasonable interference with the peace, comfort, or convenience of another person</i> ¹⁴ . Therefore the focus of a Bylaw must be on protection of public from nuisance. The issue that needs to be addressed in this case is managing lighting to avoid effects on the night sky, as opposed to effects on people’s comfort.
Outdoor lighting fixed to or associated with permanent buildings or activities, and are permanent (used regularly) and as such are not short-term and temporary activities which are more appropriately controlled by a bylaw.

6.3 Option 3 – Amendment to District Plan provisions - Plan Change

Lighting within the district is currently controlled by the provisions contained within the WCDP. This option would involve retaining the management of lighting within the WCDP but refining the provisions to better respond with the identified issue.

Amendments to the WDCP would need to be undertaken by way of a plan change by the Councils in accordance with the procedure set down within Schedule 1 of the RMA.

Pros

¹⁴ Auckland Council Property Maintenance and Nuisance Bylaw 2015

Lighting in the district is already managed by the WCDP. This is where the public expect to find the provisions that control lighting. Controlling lighting through provisions within the District Plan is common practise within New Zealand.
The RMA Schedule 1 process provides for public involvement in the development of the provisions by way of submissions and further submission. Submitters also have the opportunity to appeal a decision.
The Plan change can specifically address the identified issue. The scope of the plan change is therefore very isolated.
Provisions of the plan can be specifically proposed to address light pollutions and its effects on the ability to view the night sky. This approach is consistent with the other areas in New Zealand with a Dark Sky reserve, being the McKenzie District.
Plan amendments to better provide for associated Dark Sky Reserve activities (activities within the rural environment that are likely to be associated with dark sky tourism) can occur at a later stage and might be most efficiently considered as part of the broader District Plan Review process currently underway.
Cons
The plan change process can be costly and time consuming.

6.3.1 Option 3A - Plan change - Provisions applying to the whole of the Wairarapa

Option 3A involves the amendment of the WCDP lighting provisions that apply over the whole of the Wairarapa District regardless of location or zone.

This is consistent within the current approach taken within the operative WCDP. The current WCDP provisions contained within the 'General Rules' and objectives, polices and assessment criteria for artificial lighting are not location focused.

6.3.2 Option 3B - Plan change - Provisions apply only to certain areas

Option 3B involves amending the lighting provisions of the WCDP, but applying those provision only to certain areas, namely the dark sky reserve area. This would involve identifying a particular area/s where the lighting provisions are applied to resolve the identified issue.

Option 3A - Provision apply across the whole District	Option 3B - Provisions applying to certain areas
Plan users (the general public, businesses, consultants and Council officers) are familiar with the plan and how it works.	Applying provisions to certain areas would be a new approach to the control of lighting within the WCDP, but is possible through the use of planning and mapping mechanisms such as overlays. This approach is targeted to apply provisions

	only where additional lighting control is required.
The provisions of the Plan apply equally across the district and to all activities, reducing light pollution across the district as a whole.	The provision would be specific to area where it is identified that light pollution needs to be more tightly controlled, namely the identified dark sky reserve area over the South Wairarapa and Carterton.
Does not require identification and mapping of a 'overlay area' where lighting provisions would apply.	Would require identification and mapping of areas where provisions apply.
If a dark sky reserve accreditation is obtained for the South Wairarapa and Carterton, provisions that apply across the district may help to support the expansion of the 'dark sky reserve' in the future.	If amended lighting provisions are required to assist in the expansion of the dark sky reserve area within the future, a further plan change would be required.
The costs of implementation of the provisions (ie more expensive lighting) would be passed into all plan users, even those outside the intended dark sky reserve area of South Wairarapa and Carterton.	The costs of implementation of the provisions (ie more expensive lighting) are only passed on to those that are located within identified areas.

6.4 Option 4 - Non-Regulatory methods

Option 4 involves the use of non- regulatory methods to control lighting within the district. This could involve the use of methods such as;

- Education
- Lighting Design Guides provided by the Council or the Dark Sky Society

Pros
Financial costs for implementation are likely to be lower than the Councils using Bylaws or a Plan Change.
Educating people the story of the 'night sky' may make them more invested in the outcomes.
Can be used in conjunction with other 'options' outlined above.
Cons
Relies on the 'good will' of individuals for implementation.

There is no ability to 'take action' against those who do not comply.

7 Preferred Option

The tables in Section 6 above identify the pro's and con's of each option available to the Councils, to assist in assessing the options available and selecting a preferred option.

Section 5 of the report identifies the resource management issue that is required to be resolved by the Councils. Option 1 -Status Quo, will not resolve the identified issue and as such should be ruled out.

Option 2 - Bylaw provides a legitimate way of controlling lighting within the district, however one that is primarily designed to manage nuisance, not effects on the environment. In addition, this option would be a new approach to managing lighting within the district which may take some time for the community to get used to and understand. For these reasons, it is not recommended that Option 2 is pursued.

On the basis of the analysis above it is recommend that the Councils proceed with **Option 3** - Plan Change, in combination with **Option 4** - Non-regulatory methods.

The outcome of this recommendation would be an amendment to the provisions of the WCDP to respond to the resource management issue raised within Section 5 of this report. Changes to the WCDP would ensure that lighting for any new activities within the District is controlled, so that lighting will not contribute to light pollution or have adverse effects on the visibility, brightness or clarity of the night sky.

The nature and the area of application (ie Option 3A or Option 3B) of these provisions would be developed and assessed as part of the Plan change process.

For existing activities, non-regulatory methods such as education, undertaken by the Councils and the Dark Sky Society, would assists in highlighting to the public on the benefits of lighting that would comply with the WCDP provisions. It would be the intention of this process that the community would 'get on board' to voluntarily change lighting to reduce light pollution.

Disclaimer

We used a lot of different sources of information to write this report. Where we could we tried to make sure that third party information was accurate, but we couldn't audit all those external reports, websites, people or organisations. If the information we used turns out to be wrong, we can't accept any responsibility or liability if that affects our report or its conclusions. We might (but aren't required to) update our report if we find any additional information that was available when we wrote the report that affects its conclusions.

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