



Aotearoa

GREAT BARRIER ISLAND

greatbarrier.co.nz

**INTERNATIONAL DARK
SKY SANCTUARY**

Annual report 2018

1. INTRODUCTION

In the first full year's operation, the Sanctuary has continued the enthusiastic commitment that marked the application phase of this project. This report briefly summarises the highlights under the following sections: Governance, Regulatory and Compliance, Outreach, Promotion and marketing, Community and Commercial Activities, IDA Liaison, and Night Sky Quality—Measuring the Darkness. Overall, the Dark Sky Advisory Group (DAG) believes the year has been a resounding success. The Dark Sky Advisory Group (DAG) has settled into its role as overseer and promoter of the initiative to the Local Board, the Governing Council and the local community. Auckland Council is moving towards full adoption of the formal regulatory framework necessary for long-term on-island protection of the Sanctuary, and has actively engaged with the committee to produce interim advisory notices for all landowners of the island. The island's promotion as a Sanctuary has continued with wide-ranging national and international publicity. Local business initiatives are offering some exciting additions to the island's commercial prospects while promoting the conservation ethos of the Sanctuary. And the continuing data collection exercise confirms the pristine qualities of the skies above Great Barrier.

2. GOVERNANCE

In 2017 the Aotea Great Barrier Local Board established a representative advisory committee, the Dark Sky Advisory Group, to manage the day-to-day issues arising from the Sanctuary status, to advise the Local Board and to listen to and reflect wider community views of the Sanctuary. This committee has now met three times, and has dealt with long-term regulatory and strategic planning questions, outreach programme development, local signage, and general matters. The group consists of the original Dark Sky Project Team, representatives of the Local Board, representatives of local manawhenua—the local and regional Maori people, local astronomy enthusiasts, and members of the general public. Meetings are publicly advertised, open, and managed by open debate and consensus.

- 3.** The Aotea Great Barrier Local Board has been unstinting in its support and encouragement. The board undertook the application and has continued to provide guidance, support, encouragement and the political umbrella which has made the project possible. Neither the Sanctuary nor this year's activities would have been possible without this commitment.

4. REGULATORY AND COMPLIANCE

The current political and legal structure of Auckland Council, the overarching regional authority, is quite recent. It involved the merger of several independent statutory bodies into a unified regional authority. As one of the smallest of those authorities Great Barrier will be among the last to be brought under the planning ordinances of the unitary city. The final legal structure to protect the Sanctuary will come with the inclusion of the island's current planning regulations into the Greater Auckland Unitary Plan. This is necessarily a slow process, and the Dark Sky issues are only a small part of this process. The Council has begun the mandatory consultation stage, and the Advisory Group has received commitments from planners that the Sanctuary requirements will be given full weight in the consolidated Unitary Plan. This is expected to formalise the current situation and make explicit the current general and aspirational levels of protection. The Advisory Group

includes members with planning expertise, and we will be fully involved in submissions during the consultative process. As an interim measure the Council has produced an advisory notice which has been sent to every landowner on Great Barrier, copies of which will be included in the Resource and Building Consent application packs for the island. A low-res copy of this Advisory accompanies this report (Appendix D). The Advisory is an adaptation of the IDA's notices and includes Bob Crelin's updated visual, for which the Council received copyright approval. We note our appreciation for Bob Crelin's generosity in this regard.

5. Compliance is not seen as a particularly urgent problem for the island. A very small number of sites were originally identified as being potential sources of light pollution. The owners of each of these has been approached informally. The most significant site of 'dramatic' lighting was the Department of Conservation storage yard at Okiwi. The technical solution will be to install timers and motion sensors to the lights so that they will not operate outside a 10—10:30pm curfew. This is scheduled to occur in the next maintenance round for the site. The need has been pre-empted by the decision to simply leave the lights turned off unless they are needed. The two clubs and Tryphena and Claris have prominent lighting at the car parking areas (both clubs) and the tennis courts (Tryphena). The light designs for Tryphena Club appear to meet the approved lighting types in respect of shading and shielding. The approach to Tryphena club has been taking steps to ensure the tennis court lights are turned off when the courts are not being used. This is a relatively minor issue. There are safety issues at both clubs as there is a lot of public movement across these spaces. Again informal approaches have been made. The Claris Club committee has agreed to work towards a long-term technical solution as soon as possible- by shading and redirecting the existing lights. The formal solution is not seen as critical. The clubs are now aware of the problem; they both have a curfew in that they are only open for 3 nights a week, and are rarely ever open beyond 11:00 at night. No lights operate outside that time. Local businesses have been generally cooperative. Tipi and Bob's motel is upgrading their security lighting to ensure it meets that IDA standards. The Mulberry Grove Shop is regularly reminded of its advertising light, and just as regularly turns the light off. The owner is planning to install a timer set at 10:30pm in his maintenance schedule. The local Irish Bar has a de facto curfew when it closes at around 10:00 to 11:00pm each night. The Advisory Group accepts that the bar has heightened security and safety concerns, but the de facto curfew ensures that the amount of localised light pollution is very low. In all cases the compliance involves existing-use rights which have considerable protection under New Zealand law. Consequently, informal and cooperative efforts are considered the best option at this stage.
6. The Dark Sky Advisory Group has determined to take a long term strategic approach to maintaining its status. Currently, the Group chair is reviewing the city planning lighting strategies for areas north of the current urban boundary of mainland Auckland. No substantial development is anticipated in this area for the next 20 to 30 years. However, the Group has decided that the island's Local Board needs to establish itself and the Sanctuary technically as 'interested parties' in any planning decisions which allow increased population density in areas that could impact the northern coast of the island through any extension of

Auckland's light dome. The Group's representative has met with Auckland Transport officers and has had a useful briefing on initiatives which the city is taking to reduce light pollution. Street lighting throughout New Zealand is moving to LED technologies. At present the NZ Transport Authority has set 4000K as a national standard of light colour for street lighting. On the positive side, Auckland Transport is implementing digital timing controls and setting new standards for shading and shielding to reduce light spill. While the immediate risk to Great Barrier is nil, the Advisory Group is taking a proactive long-term position and preparing position papers for both the Local Board and Auckland Council. The Group is taking several initiatives independently on this matter, but has also established links with the wider Dark Sky community in New Zealand and we are participating in information exchange with the long-established members of this community.

7. OUTREACH

The Dark Sky Advisory Group set itself a broad range of outreach goals for the year: increasing the general skill level and understanding on the island, bedding in the widespread community support and enthusiasm, and promoting the island in the greater Auckland and international arenas. Auckland City adopted a Dark Sky theme for its Annual Report 2017-2018, a tacit recognition of the importance of dark skies to the largest urban area in the country. (Appendix C). The 'flagship' of this outreach programme on the island was a month-long Dark Sky festival, the Matariki Festival.

- 8.** Matariki is the Maori name for the Pleiades constellation, and the date in late June when the constellation rises in the eastern morning sky before sunrise is taken traditionally as the Maori New Year. This year the entire month of July was devoted to a range of 'sky' activities aimed at a variety of audiences: children, astronomers, artists, the wider island community, off-island photographers, and visitors. The Festival included the following activities: a dawn ceremony at the northern Kawa marae marking the start of the Festival, a month-long island-wide photographic exhibition including nightscape and astro-photographic work, rocket-making for children of all ages, a school's opening ceremony, public lectures on Asteroids (Alan Gilmore), Pathfinder Stars (Nalayini and Gareth Davies), Measuring the Darkness (Nalayini Davies), Life cycles of stars (Grant Christie), Radio Astronomy (Tim Natusch), An Introduction to Astronomy Course (Grant Christie), a family film night, Basic Night Photography course (Mark Russell), Moondance—Interpretive Dance (Ann Way), Mars of Medlands sky viewing (the Good Heavens team), and the festival rounded out with a 'formal' event, the Starlight Ball at the Tryphena Club. A planned sundial making class for children of all ages was cancelled as the sun failed to cooperate. Total attendance at events was over 400, which is quite extraordinary from a total island population of under 1,000. The event attracted off-island and international visitors, and the event web-site attracted over 27,000 views. The island has gained permanent assets from the festival as most photographers have donated their prints to the community for promotion of the Sanctuary and the island. The Maori language television programme, Te Karere, also featured two articles on the island Sanctuary and the initiatives being undertaken by the manawhenua (the local and regional Maori iwi).

9. The Astronomy group has been less active in a formal sense this year; its core membership has been fully committed to the committee work or some private astronomical ventures, but we have managed to arrange visits from John Hearnshaw, emeritus professor of Astronomy from the University of Canterbury, and Emily Lakdawala. We have had a small number of basic practical astronomy sessions and training sessions for use of the club's telescope.
10. The Dark Sky team, Richard and Gendie Somerville-Ryan, Nalayini Davies, and Izzy Fordham gave a presentation on the path to achieving Sanctuary status at the Tekapo Conference. Gendie and Richard have also given presentations on island to the Probus club of Whangaparaoa. And Richard and the two leaders of the commercial sky watching initiative, Good Heavens, have made presentations to the Hauraki Gulf Forum—a statutory regional environmental authority. Nalayini Davies produces a star chart for a monthly page in the local newspaper, the Barrier Bulletin. Given the island's small population base, it is likely that the level of 'Dark Sky' and Astronomy-related publicity has reached saturation point.
11. The IDA Dark Sky Sanctuary signage has been installed at Claris Airport, and is being installed at the other principal points of entry to the island. The Dark Sky initiative is one of the major brand themes promoted by the local visitor organisation, Destination Great Barrier, and is a dominant theme at the airport's small visitor information area.

12. PROMOTION AND MARKETING

The island has continued to receive excellent national and international coverage of the Sanctuary status and the initiatives being undertaken on the island. See Appendix B for a summary of media links 2017-2018. The Matariki Festival was widely covered in the local media, with heavy internet interest, attracting some 27,000 views on Eventfinda. The Sanctuary gained mainstream coverage when it was featured in a 10 page article in Singapore Air's in-flight Silver Kris magazine, achieving the added boost from a cover-page photograph. The organising committee arranged for the purchase of licences for a variety of Night Sky photographs featuring Barrier landmarks. These have been widely used for a range of island promotion and publicity. In part this coverage reflects the media experience and activities of the project team; in part it reflects international responses to an attractive idea and an attractive place.

13. COMMUNITY AND COMMERCIAL

The local community has responded quickly and creatively to the Sanctuary status. Within months of the award, and after the sponsored Introduction to Astronomy Classes held in 2017, four community groups set out to establish commercial night-sky related activities. The most active of these is Good Heavens, a small company of two entrepreneurs who are now running personalised and customised guided sky observation sessions. A second enterprise, Star Treks, has just launched, focussing on guided tramps through the island's bush reserves. This is developed around providing trampers the opportunity of experiencing the native forests at night with options of fully catered stop-overs at one of the Department of Conservation's huts. The third initiative is being developed around the

stories of the local manawhenua, the indigenous Maori hapu-the local maori communities. The proposed model will be to provide star watching opportunities structured around the indigenous stories and the foundation stories of the island's original people. It is expected that this initiative will be operating in 2019. The Christian Camp and Retreat at Orama has been active in Astronomy and night photography sessions both as additional offerings to their residents and visitors and as special events organised around a Dark Sky or astrophotographic theme with world-renowned photography Mark Gee. Another alumnus of the Introduction to Astronomy programme held in 2017 has started to offer star-watching experiences to guests of the camp. The camp has been assisted by off-island astronomers donating their time and expertise to building the skill base in the local community.

14. IDA LIAISON

The island was fortunate to be able to host a visit from John Barentine during the year. Unfortunately the weather was dreadful for the visit, so we were not able to demonstrate the observation quality of our night skies, but the trip provided ample proof of the lack of any significant light pollution from the island. The visit established a useful point of personal liaison between the island and the IDA.

15. NIGHT SKY QUALITY...MEASURING THE DARKNESS

A custom-designed sky quality monitoring programme has been instituted from April 2017. Findings to-date confirm the pristine quality of the night skies of Aotea/Great Barrier Island with no change to its night sky brightness at around 21.6-21.7 mpsas. Although light pollution is non-existent in Aotea/Great Barrier Island, a variety of astronomical factors together with weather and atmospheric conditions impact its sky quality. See Appendix A for a detailed technical report.

16. CONCLUSION

The Dark Sky Advisory Group can point to a range of achievements at the end of this reporting year. The level of political and financial support it has received from the governing authority has been outstanding. Personal links across the astronomical and Dark Sky community have been important. The island has a tradition of working on its own. Going forward we intend to establish closer liaison with related organisations across New Zealand and internationally at an organisational level.

15 September 2018

Richard B Somerville-Ryan
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