Warrumbungle Dark Sky Park Report: 1 Oct. 2017 to 30 Sept. 2018

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General

Following the recognition of the Warrumbungle Dark Sky Park (WDSP) by the International Dark-Sky Association (IDA) and the subsequent public announcement on 4 July 2016, a Working Group was set up to coordinate the activities of the two major stakeholders in the Park: the NSW National Parks and Wildlife Service (NPWS), owners and operators of the Park, and the adjacent Siding Spring Observatory (SSO), owned and run by the Australian National University (ANU).

On 1 July, 2018, operations of the largest telescope at SSO – The Anglo-Australian Telescope (AAT) – were transferred from the Australian Federal Government to the Australian National University. This event marks a major milestone in the history of the AAT and SSO. As a result of this change, the old SSO DSC was disbanded, and a new SSO DSC established. The remit of the new committee is broadly similar to the old one, but has a greater focus on public education and outreach. The committee had its first meeting on 26 September, 2018.

The newly formed SSO Dark Sky Committee (DSC) has now taken over the activities of the Working Group, since the work of that group is now complete and the DSC committee has a much broader representation of interests than the Working Group. The SSO DSC includes representatives from SSO, and NPWS, an industry lighting expert, representatives from local, state, and federal governments, and a representative from the tourism industry. The committee is chaired by the SSO Director.

The members of the SSO DSC are:

A/Prof Chris Lidman (Director, Siding Spring Observatory, and committee chair)
Prof Fred Watson (Department of Industry Innovation and Science)
Zoe Holcombe (Australian National University, and committee secretary)
Dale Oliver (Warrumbungle Shire Council)
Brad Condon (Australian National University, and SSO Site Manager)
Nikki Allen (NSW Department of Planning and Environment)
John Whittall (NSW National Parks and Wildlife Service)
Marnie Ogg (Tourism representative)
Timothy Shotbolt (Representative from the Lighting Industry)
Millisa Kelly (Gilgandra Shire Council)
Matthew Cock (Coonamble Shire Council)
Jessica Holland (NSW Department of Planning and Environment)
Richard McDermid (Macquarie University)

Expansion and the Formal Opening of the Dark Sky Park

On 29 January, 2018, the boundaries of the Dark Sky Park were expanded to include Siding Spring Observatory.

On 29 September, 2018, the Dark Sky Park was formally launched by the NSW Chief Scientist and Local Mayors. The event was sponsored by NPWS and was attended by 150 people. The Australian Premiere of the film Saving the Dark was screened at the event.

Updated Orana Dark Sky Guidelines

In 2016, the Orana Dark Sky Guidelines were updated. A copy of the guidelines is provided as an annex of this report.

A $AUD100,000 grant was provided by the NSW Department of Planning to educate local businesses and communities of the updated guidelines. In June 2018, a report outlining the activities funded by the grant and detailing the work done with councils, business chambers, local communities, electricians, certifiers, and the general public was presented to the NSW Department of Planning and to other stakeholders.

The project report lists a large number of actions and activities that were undertaken as part of the grant. We do not list them here, as we cannot do justice to the breadth and number of activities. Instead, the report is provided as a second annex to this report.

The report noted four key areas where improvement is needed.

1. A gap in the knowledge of the guidelines particularly between newer and established generations in the Orana Region.

2. Apathy and inadequate support from councils, businesses and nationwide business operations

3. A lack of authoritative direction around the guidelines; who to go to, who polices them, where to get information, why the guidelines exist

4. Underutilization of the opportunities and benefits for sustainability, energy savings and dark sky tourism

Since the project report was written, Marnie Ogg, the author of the project report has:

- made five presentations
- conducted 5 tours at SSO over 20 days involving 100 guests
- organised the Riding the Lightwave Technology Conference at SSO– September 26-28

Since the report was written, the lights on the Newell highway have been made compliant.

Dark Sky Signage

Signage advertising the DSP has been erected on the grounds of the Coonabarabran High School and is visible from the main road entering town. Funds for this sign came from the $AUD100,000 grant that was provided by the NSW Department of Planning. The Coonabrabran Shire Council has agreed to provide funds to help maintain the sign, and provide additional signage. A photo of the current sign is shown below. A sign is also visible next to the SSO Visitor Centre.

National Park Visitation

Park visitor numbers have recovered to, and in fact now exceeded, the levels that occurred before the catastrophic fires that occurred in 2013. There is anecdotal evidence that part of the increase is due to the opening of the Dark Sky Park.

The new Visitor Centre at the WNP opened in 2018. The Centre contains a number of exhibits, including a new display featuring the Dark Sky Park.

Sky Quality

The night sky brightness at the 3.9-m Anglo-Australian Telescope (located within the WDSP) is constantly monitored. This is carried out with a Unihedron Sky Quality Meter (SQM-LR - serial port interface) mounted near the telescope. It points slightly south of the zenith and records data during the night once per minute. The results are presented at http://site.aao.gov.au/AATdatabase/met.html, which also includes meteorological data and sky camera images.

The AAT SQM output on clear, moonless nights with no planetary or Milky Way interference typically bottoms out at 22.0 mag/sq.arcsec. That reading is through the glass cover of its weatherproof housing, so 0.1 mag needs to be removed, which means that the true value is 21.9 mag/sq.arcsec.

Collaboration with Macquarie University

Since mid-2016, Macquarie University Physics and Astronomy Department in Sydney has been engaging with the Warrumbungle Dark Sky Park through undergraduate student projects around research, education, and outreach, under the supervision of Dr Richard McDermid. Four sets of students (working in pairs) have worked on these projects to date. There have been three main topics for these:

1) Comparison of an urban location (Macquarie University campus in the suburbs of Sydney) with the Warrumbungle Dark Sky Park. This involved installation of Unihedron Sky Quality Meters (SQMs) at Macquarie campus and Siding Spring Observatory, and creation of a simple web-page documenting the differences (http://web.science.mq.edu.au/~sqm/), and including a daily comparison of SQM readings between the two sites (http://web.science.mq.edu.au/~sqm/Comparison.html). This web presence and site comparison is currently being further developed as part of ongoing undergraduate projects, and will include some documentation of the sky quality at the two locations. The SQM data will be made publicly available via a simple web archive interface.

2) In collaboration with the Office of Environment and Heritgae (OEH), in 2017 a citizen science project was piloted, engaging schools in the Warrumbungle region

with the Warrumbungle Dark Sky Park. OEH provided $1,600 of support for hand-held SQMs to give to 4 local schools: Binnaway, Mendooran, and Baradine Central Schools, and Coonabarabran High. Macquarie University students and academics visited each school to give a presentation on the broad effects of light pollution, and to train the school students on how to use the SQMs and record the data. Data from students were collected via a simple web interface (kobotoolbox) that recorded SQM readings and GPS position. Around 200 measurements were captured in that time from around the schools.
In addition, a permanent SQM was installed at the Environmental Education Centre within the Warrumbungle National Park, and a hand held SQM was given to the Park visitor centre to allow e.g. campers to make their own measurements. Presentations and educational activities created by the Macquarie students were also provided to the Education Centre for use in their school enrichment programmes.

3) Co-organisation of the light pollution conference 'Riding the Light Wave of Technology' in September 2017. Macquarie undergraduate students have been instrumental in the local organization of this conference. Though Dr McDermid, Macquarie University has raised grant funding to support the involvement of international delegates and for the conference itself, as well as running public engagement in the Sydney metropolitan area (public talk, media coverage) around this event.

Media Relations

A video showcasing the Warrumbungle Dark Sky Park was developed by Destination NSW, a state government organization promoting tourism to county and outback NSW. In the video, Sstaff from the Observatory and the National Park describe the wonders of the Park and the importance of preserving dark skies.

A Dark Sky animation for the NSW Dept. of Education (DPE) featuring Prof. Fred Watson, co-sponsored by the DPE and NSW Dept. of Planning (DPP).

The DPE has also set up a dark sky planning web site with additional information on good lighting practices.

For the second year running, the Australian National Broadcaster (ABC) ran Star-gazing live from the Observatory. It was an opportunity to inform a large audience on the importance of dark skies and to promote the Dark Sky Park.

Community Outreach and Site Tours

The community-based organization 2357.org has

- created WDSP coffee cups, now sold in all cafes,
- labelled Coonabarabran shopping bags with DSP logos, and
- raised Dark Sky Park flags in Coonabarabran

Amanda Wherett, the SSO tours officer, conducts regular tours of SSO for the general public.

The following tours and events were themed around the educational message of reducing light pollution for astronomy, the benefit to the environment, energy savings associated to better lighting, and the significance and importance of the Warrumbungle Dark Sky Park.

- Cuberider SSO site tour 17th August 2017 - theme was Aboriginal astronomy and the DSP.
- Visit by Tourism Australia and Buzzfeed reporters - November 17th 2017.
- Planning and Assessment Commission site tour 22nd November 2017.
- Presentation on sustainability at Coonamble School, hosting 3 other schools around 100 students
- Presentation at Warrumbungle National Park Environmental Education Centre Science Week 2018 (14th -16th August, 2018), reaching 8 local schools and 300 students.
- A stall at the Dubbo Sustainability City Expo and Science Festival on Saturday 25th August 2018 (800 people)
- Attended the Economic Development and Tourism (EDT) advisory committee meeting 27th August 2018 - Dark Sky Park branding workshop with Warrumbungle Shire Council tourism office, Warrumbungle National Park, 2357 committee and local businesses.

Other Activities

The following activities did not naturally fall within the subsections listed above, but are included here for completeness.

- Destination NSW is developing a Strategic Business Plan for Outback NSW featuring the DSP.

- Warrumbungle Shire Council has featured the DSP in their Economic Development strategy.

- Siding Spring Observatory has been entered to the Tourism NSW Awards for their work associated to the product development around the DSP.

Annexes

- Orana Dark Sky Guidelines
- Project report on the Orana Dark Sky Guidelines