APPENDIX 4: Theme 2 A Healthy and Resilient Environment

Lighting Impacts of Development on the Sunshine Coast

OSCAR, September 2025

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1. Introduction

This appendix reflects a combination of submissions from Leigh Warneminde (CaNSCC), Lesley Dimmock and OSCAR Executive members in relation to the Sunshine Coast Regional Council's (SCRC) proposed changes to its Planning Scheme (PS).

As population and building height density increase, so too do the negative impacts of night lighting. Artificial lighting adversely affects humans, flora, and fauna. Despite measures to mitigate lighting effects, increased density unavoidably brings increased sky glow due to the accompanying increased number of lights. This increase highlights the need for light mitigation measures to be as robust and enforceable as possible. By adopting strong, enforceable lighting controls, the Sunshine Coast can reduce the ecological and human health impacts of light pollution while strengthening its sustainability credentials.

This submission will contain the following parts:

1. Strengthening the lighting provisions in regard to sea turtles
2. The addition of migratory shorebirds as a priority species
3. Strengthening the lighting provisions in regard to liveability associated with development
4. Recommendation summary

2. Sea Turtles

OSCAR welcomes the inclusion of measures in the Biodiversity, Waterways and Wetlands Overlay Code and its Overlay Mapping to further improve the protection of the priority species, sea turtles, including their habitat and negative impacts from sky glow. To ensure this Overlay is robust and effective in its implementation, OSCAR recommends further improvements to both the code and the mapping in order to address the following concerns.

a) Compliance considerations DA approval, during construction and ongoing

OSCAR recommends ongoing compliance measures to protect sea turtles and their nesting habitat.

i. Lighting during the construction phase

Only lighting post construction is considered in the proposed PS, yet there can be significant impacts from all construction lights, in sea turtle nesting sensitive areas.

OSCAR recommends including provisions to reduce/prevent the lighting during the construction phase of development. See **PO15** modifications/ suggestions.

ii. Ineffective wording

"**Visible from the beach"** is subjective wording, particularly during the assessment process, and can lead to avoidance. Examples of current avoidance are:

- any developer can say his/her development won't be visible from the beach when in fact on completion, it is visible from the beach, *e.g. the Talinga St 7 storey building at Buddina overlooking the beach*.
- any tree (or many trees) in front of a 2 storey dwelling can "die" tomorrow and remove any shielding effect it had provided, *e.g. Pacific Bvd Buddina BA202.*

OSCAR recommends alternative or enhanced expressions to reflect the research basis that has been undertaken by SCRC officers in determining sea turtle sensitive areas impacted by light. See **AS15.3** modifications/ suggestions.

"**Managed**" is subjective; it is therefore legally unenforceable and thus, compliance is, by default, avoidable. See **PO19** modifications/ suggestions.

iii. External lighting as they apply within the sea turtle nesting sensitive areas

- **AS15.2** modifications proposed have been noted in the table below to align with R1.5, noting external lighting must not be located on the roof of the building, including on any rooftop deck or terrace.
- **AS18** modifications proposed to rectify the omission of timers to manage external lights out.
- **AS15.4** modifications proposed to rectify the omission of shielding over landscape lights.

iv. **PO16** modifications proposed to rectify the reference is to the foreshore reserve vs the foreshore.

v. **AS19.3** modifications proposed to add clarity.

vi. **AS20.1** modifications proposed to add clarity.

b) Mapping improvements

Foreshore reserves vary in width, from very narrow eg 15-30 metres, to wider reserve land of up to 150 metres. Some foreshore reserves have also been subject to human modifications so do not represent natural tidal marks.

The Highest Astronomical Tide (HAT) is set, then reviewed every 19-20 years and represents a consistent point for measurements. Measuring distances from the HAT provides consistency for developers and residents, supported by a climate-resilient reference point for the changing sea level conditions (of which Pumicestone Passage is one concerning example).

OSCAR acknowledges the proposed mapping uses advanced digital assessment of anticipated lighting impacts, west of the first row of houses adjacent to the foreshore reserve. However, this measure is inconsistent for protecting the nesting habitat on the beach and/or first dune, as the mapping does not recognise the varying widths and vegetation density of the foreshore reserve areas and development proximity to the beach. Reviewing the mapping based on the 1st house approach, identifies sites at distances of between 100m and 225m from the HAT (tidal marker) for code compliance. These differences, between the narrow and wide foreshore reserve land and its vegetation systems, also result in significant variances in filtering artificial light at night along the beachfront – a primary concern for endangered loggerhead sea turtle nesting habitat. For example:

- The mapping at Buddina, to the west boundary of the 1st house is ~100-125m and to the narrow foreshore reserve appears to vary between 15 to 30 metres wide
- The mapping at Warana, to the west boundary of the 1st house is ~200-220m and to the much broader foreshore reserve appears to vary between 120 to 150 metres wide.

Base mapping measured from the HAT, not the foreshore reserve boundary, would better mitigate light impacts, particularly in areas with narrow reserves.

Amending the mapping of the sea turtle nesting sensitive areas to, at least, 250m west of HAT would provide consistency across all areas. Further, determining the areas subject to proposed increases in building heights and zoning, would provide additional protection. Suggested examples are below:

(a) all LDR and LMDR zoned land with building heights up to 3 storeys and within 250 metres of the HAT;

(b) all other zoned land with building heights greater than 3 storeys and within 500 metres of the HAT.

3. Shorebirds

The Strategic Planning Branch has confirmed that:

"The Biodiversity, waterways and wetlands overlay code (Part 6.5) includes specific lighting provisions relating to priority species – sea turtles (PO15 to PO20 of the code). This code is triggered where development is subject to the Biodiversity, waterways and wetlands overlay relating to sea turtles. The mapping associated with sea turtles applies along the coastline and may also serve to minimise lighting impacts in foreshore areas where shorebird nesting occurs."

The development controls associated with the Hotels TLPI (approved in 2024) are now incorporated into the proposed PS. The Hotels TLPI includes assessment criteria to manage and mitigate lighting impacts on priority species, including migratory shorebirds, particularly in sensitive areas such as the RAMSAR-listed Pumicestone Passage. The Sunshine Coast is part of the international flyway for migratory shorebirds so lighting impacts on the health of shorebirds are not localised to the Local Government Area.

There are areas where sea turtles are not currently nesting but support migratory shorebirds eg the eastern border of Golden Beach along the Pumicestone Passage. Including the migratory shorebirds in lighting and other development protection measures would provide the best measures for their ongoing survival.

OSCAR therefore recommends that the PS explicitly include migratory shorebirds in its lighting protection measures, applying the standards set out in the *National Light Pollution Guidelines for Wildlife* [1].

4. Light Pollution and Human Health

Increased building heights exacerbate the spread of artificial light into surrounding residential areas. Examples include:

- Lighting entering bedrooms from multi-storey lift foyers, ground-floor entrances, outdoor balconies
- Car park and spot light illumination that remains on all night (e.g. The Waves Club, Arthur Street, Caloundra, the car park associated with Seasons IGA, Caloundra)
- Roof-top bars and other late-night venues
- Sporting fields

[1] https://www.dcceew.gov.au/environment/biodiversity/publications/national-light-pollution-guidelines-wildlife."

The Sunshine Coast's subtropical climate encourages reliance on natural ventilation at night through open windows and doors. This passive cooling approach supports SCRC's Environment and Liveability Strategy and its vision for the region to become *"Australia's most sustainable"*. However, uncontrolled lighting directly undermines this sustainability goal along with causing human harm.

Scientific literature demonstrates that artificial light at night has significant and well-documented negative effects on human health. Reference is made to the following peer-reviewed research and advisory publications:

1. We're All Healthier Under a Starry Sky
2. Missing the Dark: Health Effects of Light Pollution - PMC
3. Light and Shade: In Praise of Darkness
4. Light Pollution Affects Human Health
5. Effects of Artificial Light at Night on Human Health

5. Recommendations

6.5 Biodiversity, Waterways and Wetlands Overlay Code

6.5.2 Requirements for accepted development Part 1: Activities other than rural activities

Note: Code wording is listed only where there are recommended changes. No other deletions are recommended. All recommended changes are noted in red.

R1.5	Requirements to extend to business or any mixed use premises eg roof top bars, not only residential buildings.
R1.5	Where located on land identified as a sea turtle nesting or migratory shorebird sensitive area on the Biodiversity, Waterways and Wetlands Overlay Map, approval also applies ongoing compliance post-construction: (a) any exterior lighting, including on balconies and decks: (i) is true amber or PC amber LED, with no blue or violet wavelength; (ii) is directed downward using directional fittings, such that light is prevented from shining above the horizontal plane; (iii) has a defined focal area to reduce light spill by confining the light spread to a targeted area and prevents light trespass beyond the target area; (iv) is shielded by minimum 30cm vertical shields (or the fitting is engineered to provide the same degree of shielding) or is recessed and mounted under eaves, verandahs or the roofline; (v) is fitted with light motion detection sensors and/or timers to ensure lighting is turned off when not required; and (vi) not located on the roof of the building, including on any rooftop deck; and (b) all glazing on the north, south and eastern elevations is tinted with non-reflective tinting, or utilises smart glass technology, to block a minimum of 75% of light (25% VLT) to reduce light transmission or spill from indoor lighting.

6.5.3 Assessment benchmarks for assessable development

Part 8: Priority species - sea turtles and migratory shorebirds	
Performance outcomes	**Acceptable solutions**
Development in a sea turtle nesting and migratory shorebird sensitive area OSCAR strongly recommends reviewing the mapping distance as noted in 2(b) above.	
PO 15 (extra or another PO #)	**AS15.1 (extra or another AS #)** No acceptable solution provided.

Development in a sea turtle nesting sensitive and migratory shorebird areas, during the construction phase, minimises the impact on turtle nesting habitat, the sea-finding behaviour and ocean orientation of hatchlings as well as nesting and feeding requirements for migratory shorebirds by ensuring: (a) construction works are to be restricted to daylight hours during the turtle nesting and hatching season, migratory shorebird visiting season (October – May) in addition to any further restriction imposed as part of the Operational Works approval. (b) flood lighting must not be used from October – May (turtle nesting and hatching season, migratory shorebird visiting season).	
PO15 Development in a sea turtle nesting and migratory shorebird sensitive areas: (a) prevents direct light spill from the site to the sea turtle nesting or migratory shorebird area; and (b) does not contribute to sky glow (c) Development in a sea turtle nesting sensitive area, during the construction phase, minimises the impact on turtle nesting habitat, the sea-finding behaviour and ocean orientation of hatchlings hatchlings as well as nesting and feeding requirements for migratory shorebirds by ensuring:	**AS15.1** Development is designed and oriented in a manner that minimises impacts to sea turtle nesting or migratory shorebird habitat. _____ **AS15.2** External lighting must not be located on the roof of the building, including on any rooftop deck or terrace. [Added here as R1.5 (vi) proscribes this restriction] All external lighting, including on balconies and rooftop terraces and in public spaces: (a) is true amber or PC amber LED, with no blue or violet wavelength; (b) is directed downward using directional fittings such that light is prevented from shining above the horizontal plane;

(d) construction works are to be restricted to daylight hours during the turtle nesting and hatching season, migratory shorebird visiting season (October – May) in addition to any further restrictions imposed as part of the Operational Works approval. (e) flood lighting must not be used from October – May (the turtle nesting and hatching season, migratory shorebird visiting season). Editor's note — A Sea Turtle Lighting Plan prepared by a competent person may be required to demonstrate compliance with this performance outcome and associated acceptable solutions. The **Biodiversity, Waterways and Wetlands Overlay Planning Scheme Policy** provides guidance in relation to the preparation of a Sea Turtle Lighting Plan.	(c) has a defined focal area to reduce light spill beyond the target area or onto the mapped sea turtle nesting sensitive area; (d) is shielded by minimum 30cm vertical shields (or the fitting is engineered to provide the same degree of shielding), or is recessed and mounted under eaves, verandas or the roofline; (e) is the minimum intensity required to illuminate the area; and (f) is fitted with light motion detection sensors and/or timers to ensure lighting is turned off when not required. (g) automated timers to be installed and set to switch off all balcony and rooftop terrace lights nightly at 8pm. _____ **AS15.3** All glazing (including windows, louvers, glass panels and glass doors) on the north, south and eastern elevations visible from the beach are tinted with non-reflective tinting, or utilise smart glass technology, to block a minimum of 75% of light (25% VLT) to reduce light transmission or spill from indoor lighting. _____ **AS15.4** Building design and landscaping does not incorporate vertical illumination of building, other structures or vegetation using lighting that shines into the sky. All landscaping lights are shielded.
PO16 Development in a sea turtle nesting sensitive area on a site adjacent to the foreshore provides landscape buffers that: (a) protect the edges of existing native vegetation and dune systems; and (b) screen the development (including associated artificial light) to a level where it is not visible from the beach or ocean.	Strengthen the outcomes to actively ensure dunes remain vegetated and receive regular replenishment plantings to maintain and improve beach screening from artificial light along all priority species areas on the Sunshine Coast
PO18	**AS18**

Advertising signage does not contribute to sky glow and light spill.	Illuminated and digital display signage is avoided. OR Where development involves illuminated signage, the sign and any associated lighting, automated timers to be installed and set to be ~~are~~ switched off nightly at 8pm.

Part 8: Priority species - sea turtles and shorebirds	
Performance outcomes	**Acceptable solutions**
Development in a sea turtle nesting or migratory shorebird area buffer OSCAR strongly recommends reviewing the mapping distance as noted in 2(b) above.	
PO19 Development in a sea turtle nesting or migratory shorebird area buffer ensures all external lighting is positioned and managed to minimise sky glow and light spill. NOTE: "**Managed"** is subjective wording, particularly during the assessment process, and unlikely to be legally unenforceable. OSCAR recommends a more appropriate term.	**AS19.1** All external lighting is directed downward using directional fittings such that light is prevented from shining above the horizontal plane. --- **AS19.2** External lights are fitted with motion detection sensors and/or timers to ensure lighting is turned off when not required. --- **AS19.3** Development involving sport and recreation activities is designed to ensure all field lights are shielded and direct ~~target~~ light only onto the sports field, not contribute to sky glow ~~reduce sky glow~~ and light trespass, and avoids new floodlighting.
PO20 Advertising signage and security lighting is designed to minimise sky glow and light spill.	**AS20.1** Illuminated signage is avoided. OR Where development involves illuminated signage, the sign and any associated lighting is designed, installed, positioned

	and operated to minimise sky glow and light spill through the following measures: (a) reduced intensity lighting; (b) use of long wavelength lights; (c) use of shielded lighting; and (d) directing lighting downwards and onto areas of interest (no uplighting).
Mapping	• All lighting overlay mapping for priority species uses the Highest Astronomical Tide (HAT) as the eastern starting point. • Extend the mapping for turtle and shorebird sensitive areas to a consistent 250m from HAT
Priority Species	• The PS explicitly include migratory shorebirds in its lighting protection measures, applying the standards set out in the *National Light Pollution Guidelines for Wildlife* [2]. • Include Migratory shorebirds in the Editor's notes as priority species
Lighting	• Lighting provisions to be underpinned by enforceable codes with clear compliance, monitoring, and enforcement mechanisms. Compliance must be monitored, post development. • All lighting control requirements should align with the National Light Pollution Guidelines for Wildlife and relevant International Dark Sky Association principles. • Lighting management plan for the Dark Sky reserve be extended across the SC LGA.

[2] https://www.dcceew.gov.au/environment/biodiversity/publications/national-light-pollution-guidelines-wildlife."