



Marine Turtle Conservation Plan

Due to Council for endorsement 2022

Co-created with the community,
scientific partners, Council and
Traditional Owners.

*'Marine turtles surviving and
thriving on the Sunshine Coast,
co-existing in harmony with people.'*



Marine Turtle Nesting Sunshine Coast 2005–2020

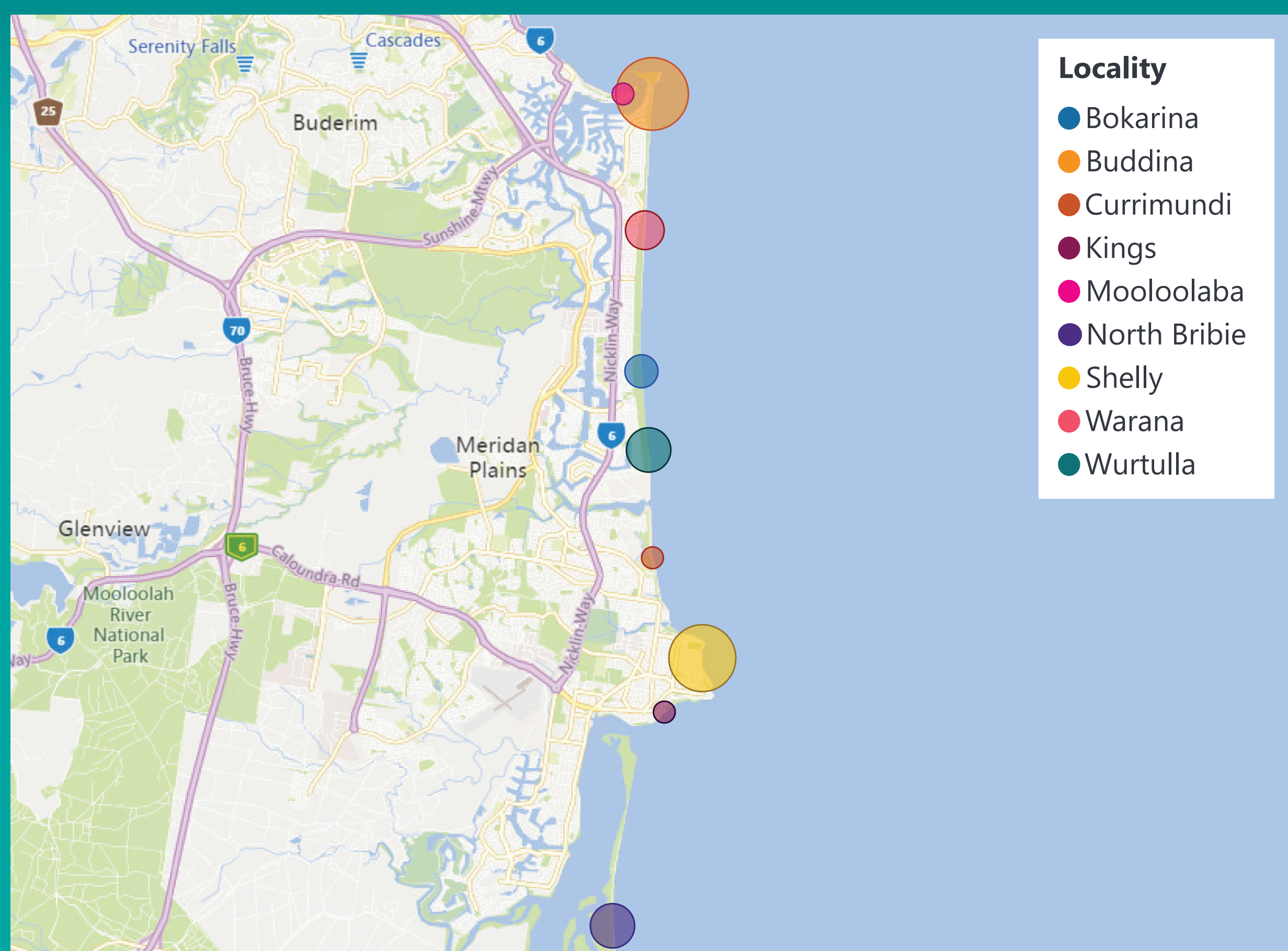


TURTLECARE: 22KM FROM NORTH BRIBIE ISLAND TO POINT CARTWRIGHT

Program aims:

- Implement ongoing marine turtle monitoring and management program for nesting activity on beaches from North Bribie to Point Cartwright.
- Identify and record species, nesting locations, frequency and success rates of nesting activity.
- Encourage community awareness and commitment to turtle conservation through the study and enjoyment of turtles and protection of their environment.

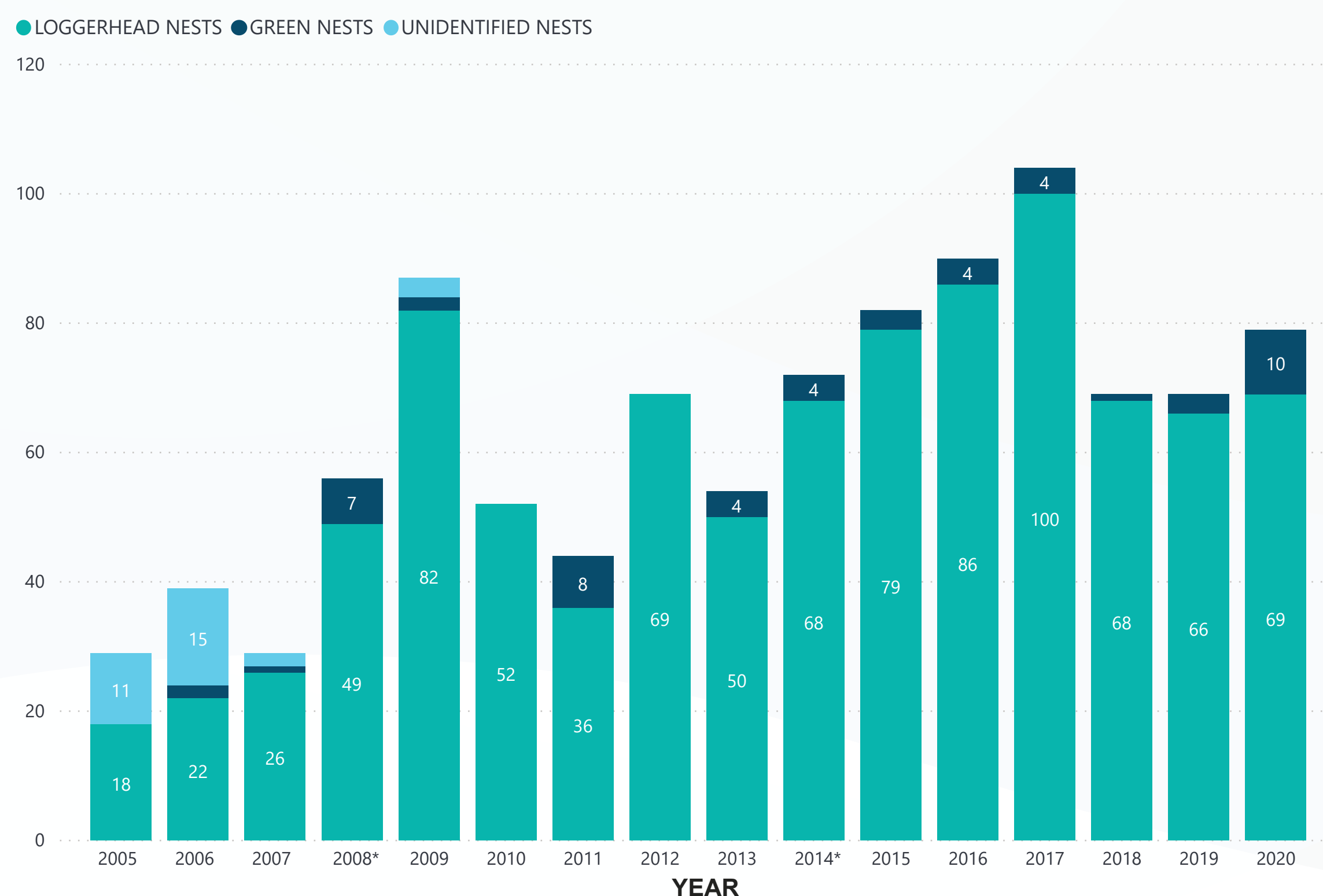
TURTLE NEST ABUNDANCE SOUTH SUNSHINE COAST 2020/2021



MARINE TURTLE NESTING SUNSHINE COAST (NORTH BRIBIE TO NOOSA RIVER) 2005–2020

OVER
90,000

HATCHLINGS TO OCEAN SINCE 2005



Nesting data north of Maroochy River kindly shared by Coolum and North Shore CoastCare.
*Formal data collection commenced north of Maroochy River from 2008 and on North Bribie from 2014.

TurtleCare snapshot

2020/21



People

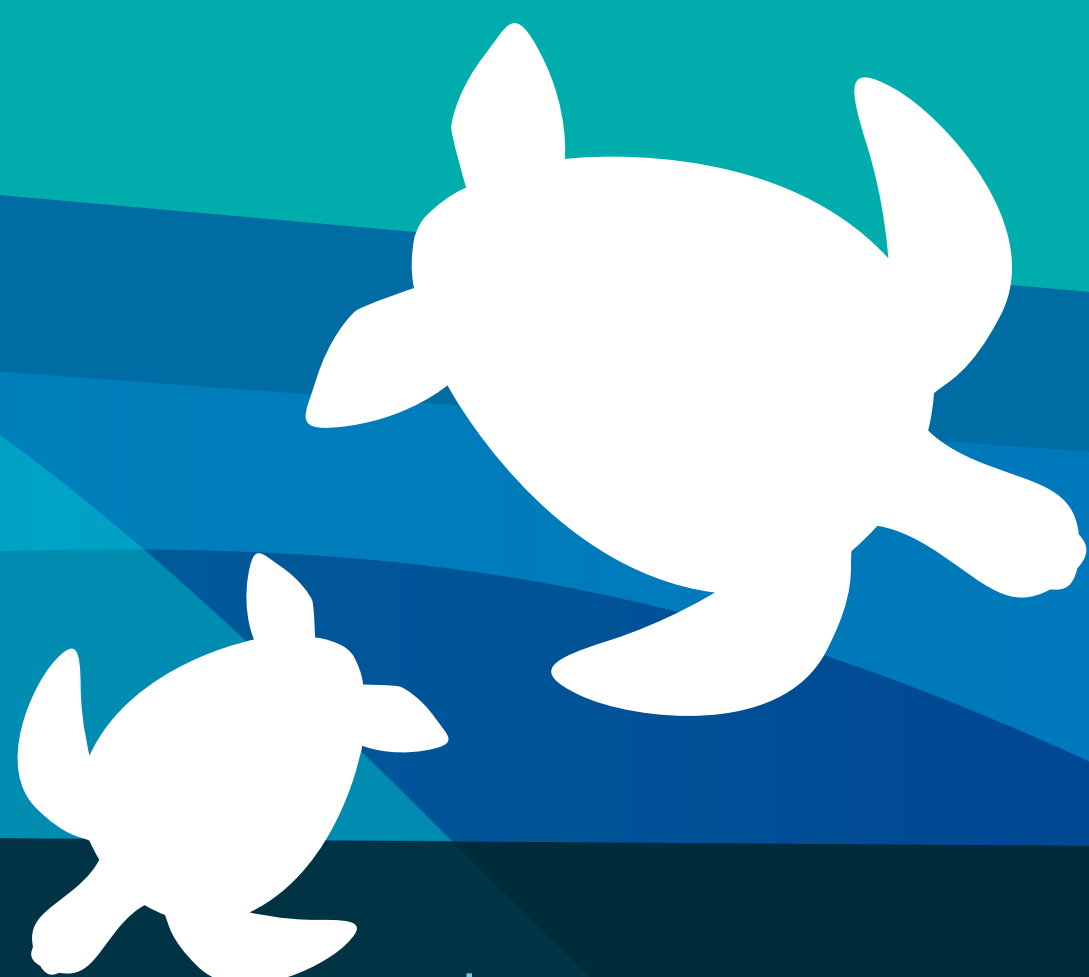
190 registered volunteers
(Age 8 – 85)

- 20 under 20 years of age
- 100 between 20 and 60 years of age
- 70 over 60 years of age

7742
hours contributed



Turtles



37 Loggerhead Turtle nests

2 Green Turtle nests

First nest ► Last nest



Shelly Beach



Bokarina

4642 eggs laid



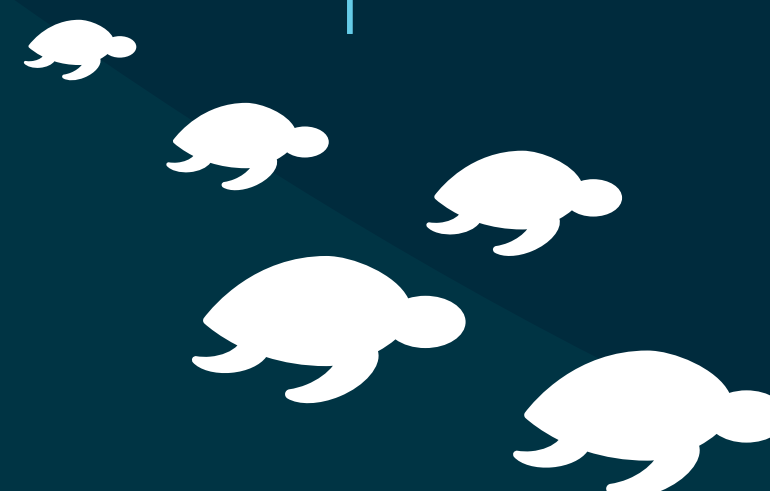
3749 Eggs Relocated

(elevated relocations due to low pressure system in December (peak nesting) and artificial light impacts)

3669 hatchlings reached the ocean

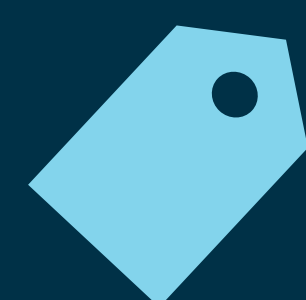
76.4% emergence success

Period to emergence
69 Days (Range 60 – 105)



3 new turtles tagged

2 Shelly Beach and 1 Kings Beach



1 returning turtles encountered

K90712 'Mystify' at Buddina – Seven breeding seasons as a tagged turtle
'Sunshine Coast's most researched nesting loggerhead'

CLEAN UP FOR THE HATCHLINGS 2021

697 volunteers



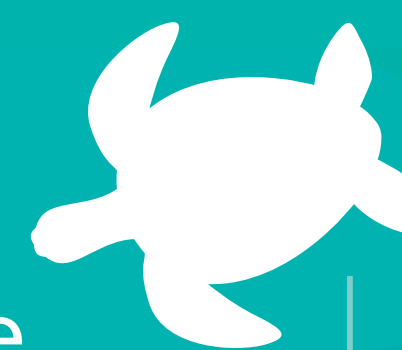
19 clean up sites

495.5 kg

of debris removed



TRAINING AND CAPACITY BUILDING



TurtleCare Annual Training Day attended by

96 volunteers



TurtleCare Advanced Training Day attended by **29** volunteers

Advanced Training at Mon Repos attended by **14** volunteers

Marine turtle nesting Shelly Beach

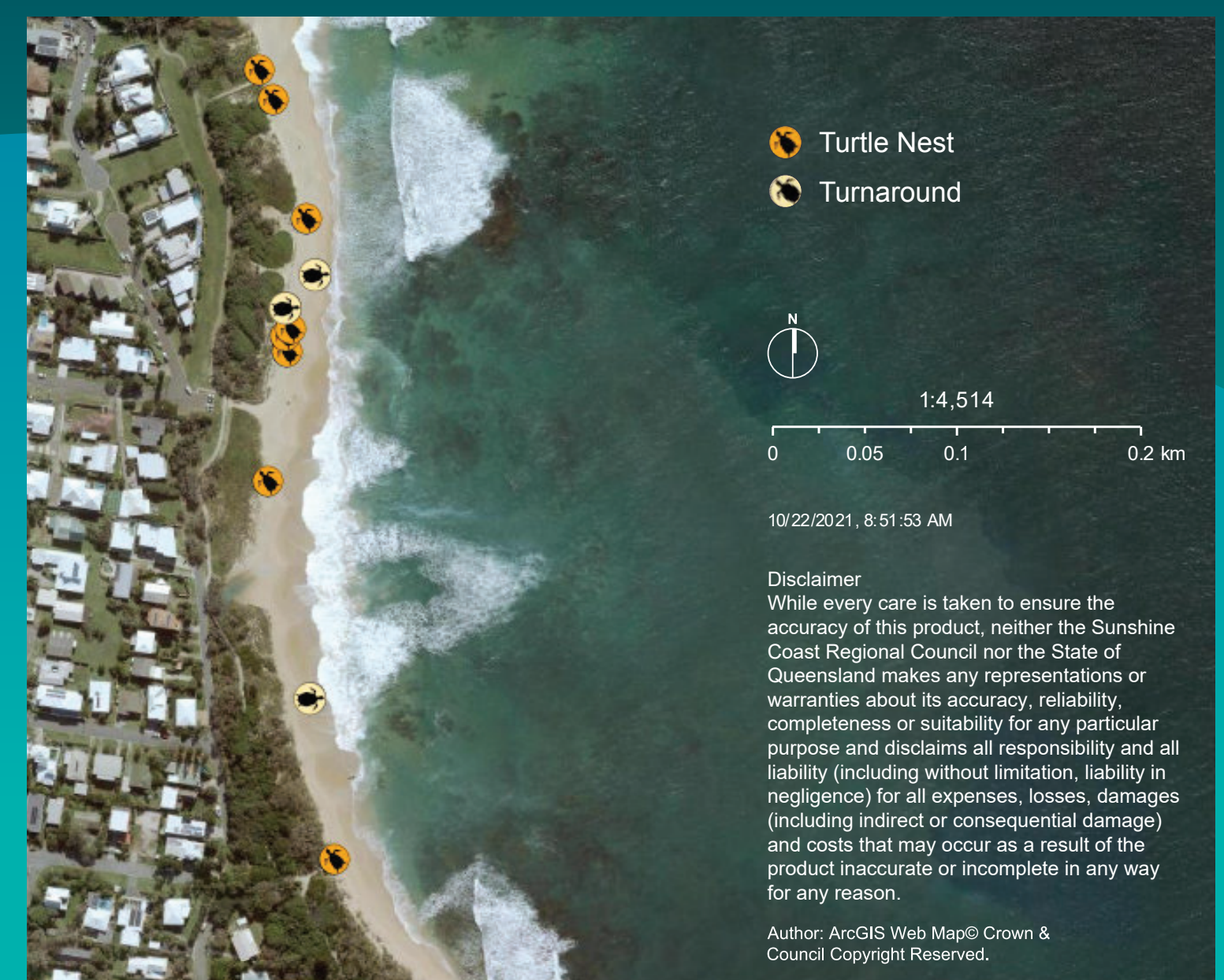


Results of monitoring the eastern Australian loggerhead and green nesting populations between 2005 and 2020 at Shelly Beach.

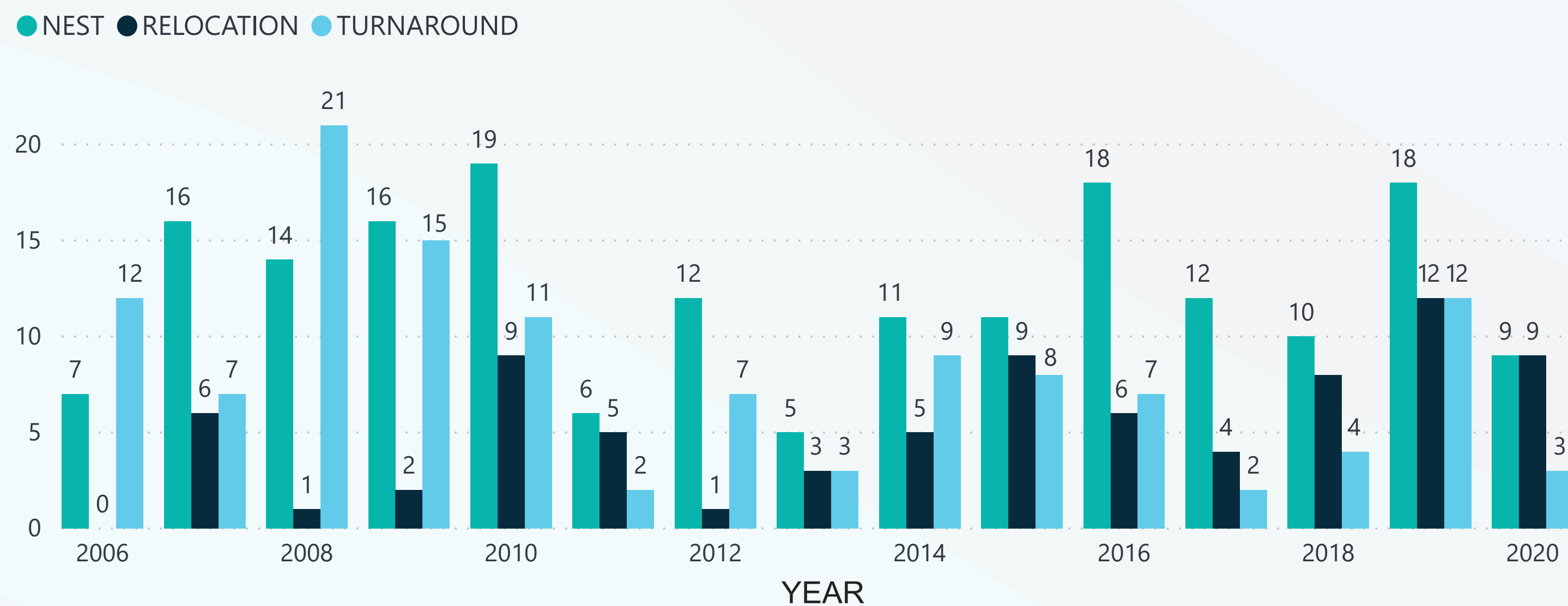
TurtleCare commenced formal monitoring of turtle nesting at Shelly Beach in 2005, then expanded to other southern Sunshine Coast beaches by 2006 and North Bribie Island in 2014.

Shelly Beach is the designated index beach for marine turtle monitoring within the Sunshine Coast region due to the consistently high monitoring effort applied across all years by trained volunteers since 2007.

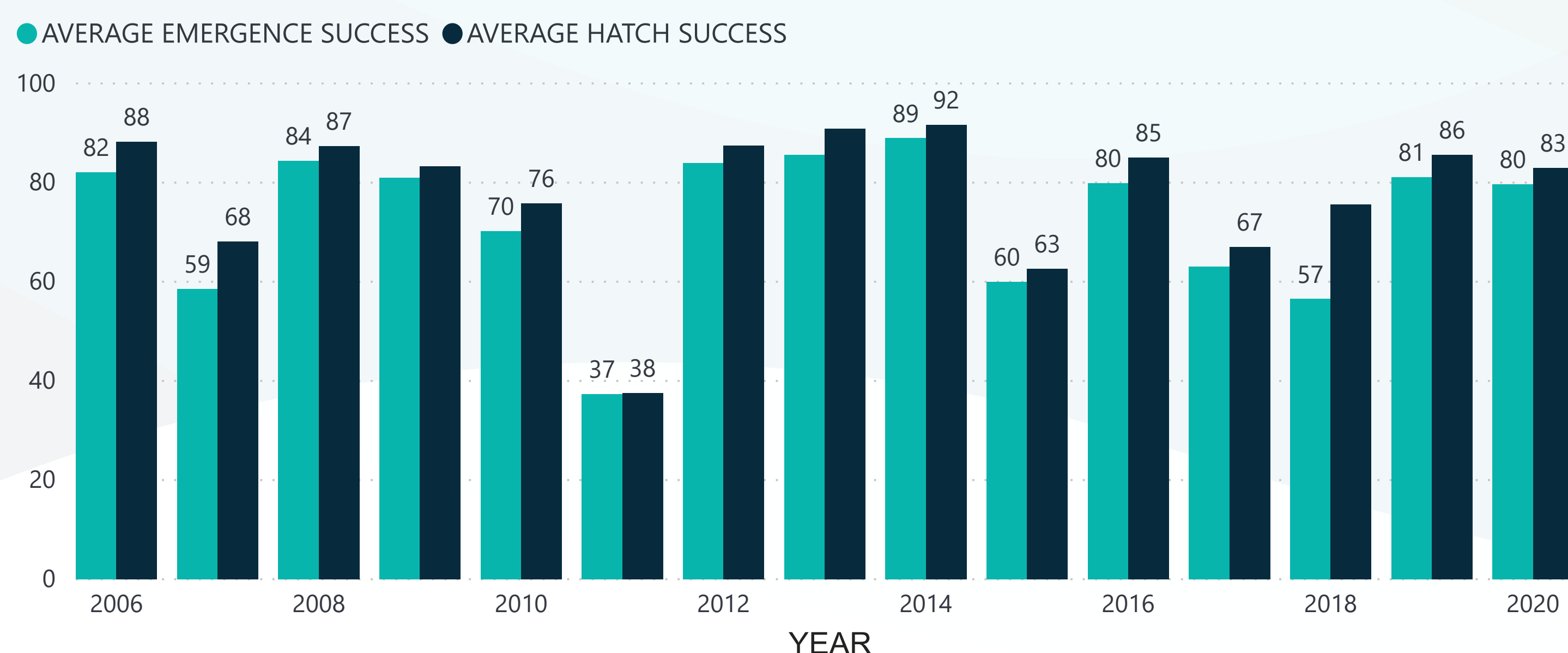
MARINE TURTLE NESTING SHELLY BEACH 2020/21



SHELLY BEACH TURTLE NESTING AND RELOCATION DATA: 2006–2020



NEST SUCCESS NORTH BRIBIE TO POINT CARTWRIGHT: 2006–2020

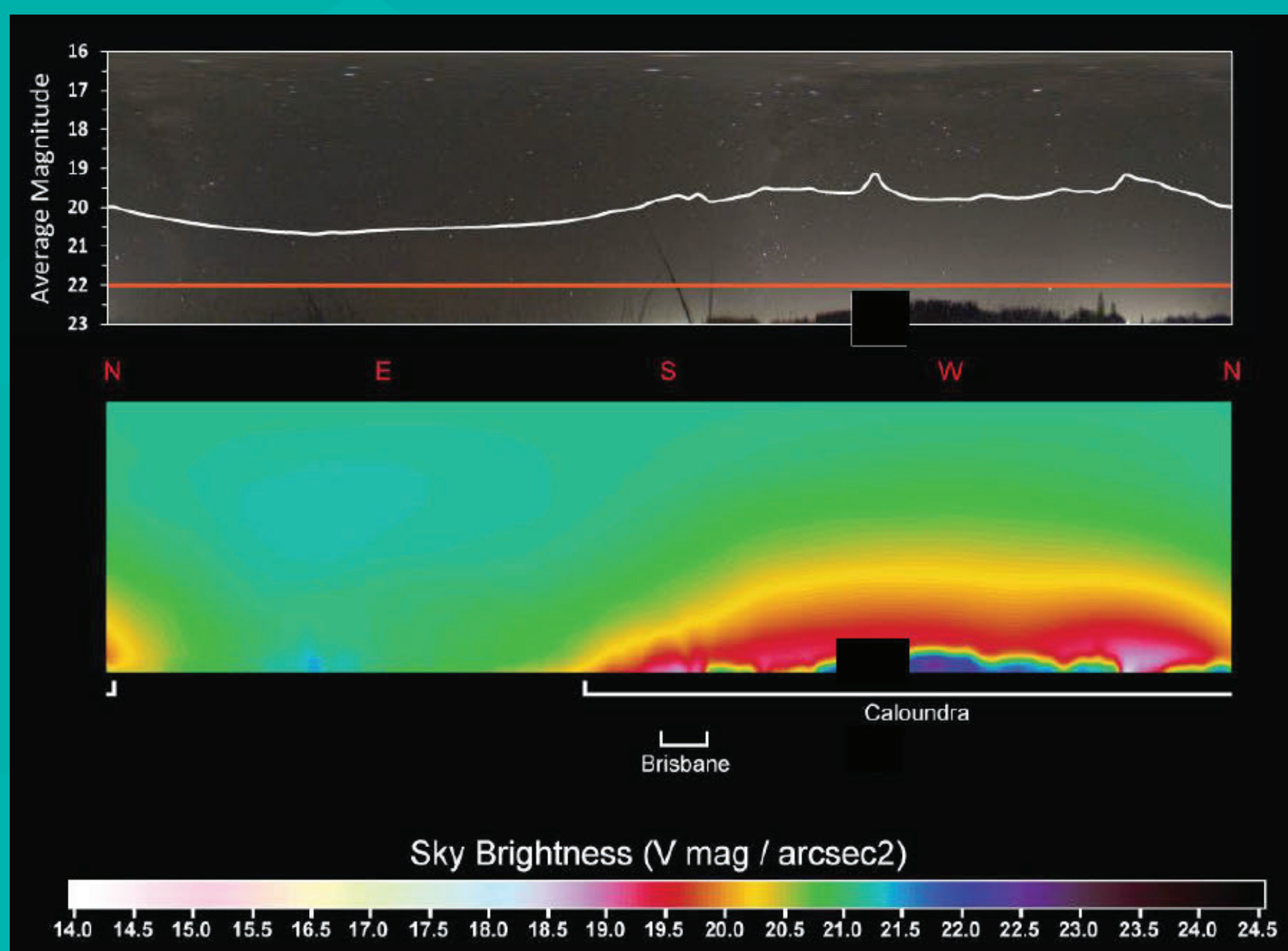


Benchmark artificial light at night study



Results from the 2017 'benchmark' artificial light at night ALAN survey - levels of night-time illumination visible from key marine turtle nesting beaches on the Sunshine Coast and South Bribie Island in Queensland ¹.

Using Sky42™ technology, images of the night sky were gathered over three survey nights at each of 16 monitoring sites (Sunshine Coast: n=13; South Bribie Island: n=3) by Pendoley Environmental during the new moon phase in June 2017 to quantify the level of light.

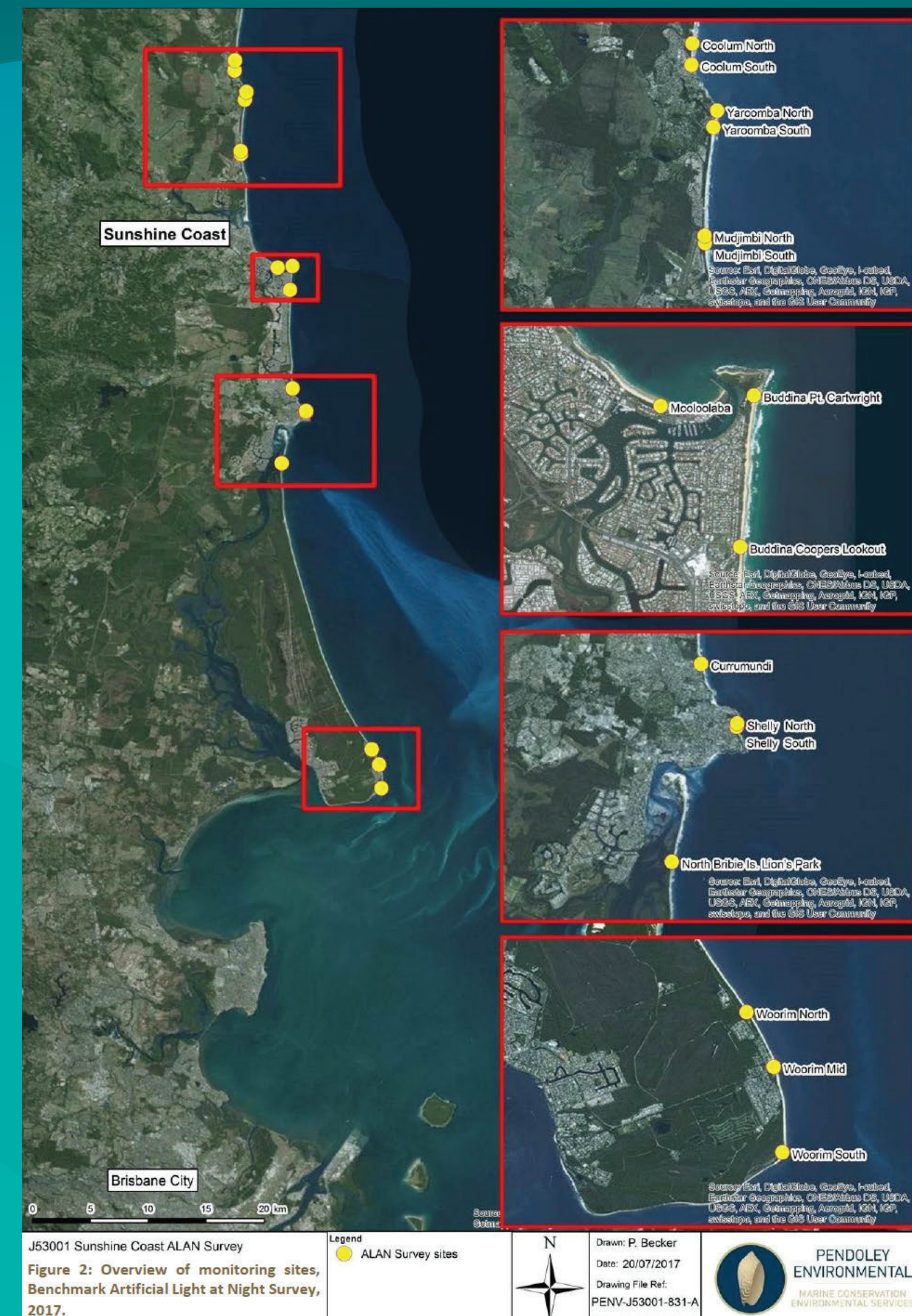


360° Isophote map of sky brightness in magnitudes/arcsec² shelly beach south (red line is target magnitude)

Hatchlings follow three primary cues when sea-finding^{2, 3}:

- 1 Movement toward brighter regions on the horizon⁴
- 2 Movement away from tall dark beach silhouettes (e.g. dunes and tree lines)⁵ and when the cues are inconsistent
- 3 Movement in relation to elevation.⁶

Artificial light is one of several competitive visual stimuli that hatchlings must integrate with natural light intensity, wavelength, directivity, and horizon/elevation cues to navigate successfully toward the ocean.



Four specific topographical, ecological and structural features were identified that support hatchling sea-finding:

- Vegetation screening: create sections of tall dark horizon for hatchlings to use as a cue in sea-finding
- Cliff elevation: where present, provided hatchlings with a dark horizon to orient toward
- Lighting design and management: modified fixtures, wattage, shielding or orientation to reduce emissions and overall sky, and
- Building orientation: angled away to avoid light spill onto the sand.

Recommendations: Full report available at tiny.cc/TurtleCare

1. Catherine BELL, K. PENDOLEY, A. MITCHELL, SUNSHINE COAST AND MORETON BAY REGIONAL COUNCILS (2017). 153001 -Artificial Light at Night (ALAN) Benchmark Surveys.
 2. BARTOL, S.M. & MUSICK, J. (2003) Sensory biology of sea turtles. In: Biology of Sea Turtles, Lutz P and Musick J (Eds) CRC Press, Boca Raton.
 3. LIMPUS, C.J. (1971). Sea turtle ocean finding behaviour. - Search 2, p. 385-387. (1982). The status of Australian sea turtle populations. In: Biology and conservation of sea turtles (K. A. BJOURNDAL, ed.). Smithsonian Institution Press, Washington, D. C.
 4. PENDOLEY, K.L. & KAMROWSKI, R.L. (2015) Influence of horizon elevation on the sea-finding behaviour of hatchling flatback turtles exposed to artificial light-glow. Marine Ecology Progress Series.
 5. SALMON, M., WYNEKEN, J., FRITZ, E. & LUCAS, M. (1992) Seafinding by hatchling sea turtles: role of brightness, silhouette and beach slope as orientation cues. Behaviour 122: 56-77.
 6. LIMPUS, C.J. & KAMROWSKI, R.L. (2013) Ocean-finding in marine turtles: the importance of low horizon elevation as an orientation cue. Behaviour 150: 863-893.

Marine turtle nest relocation



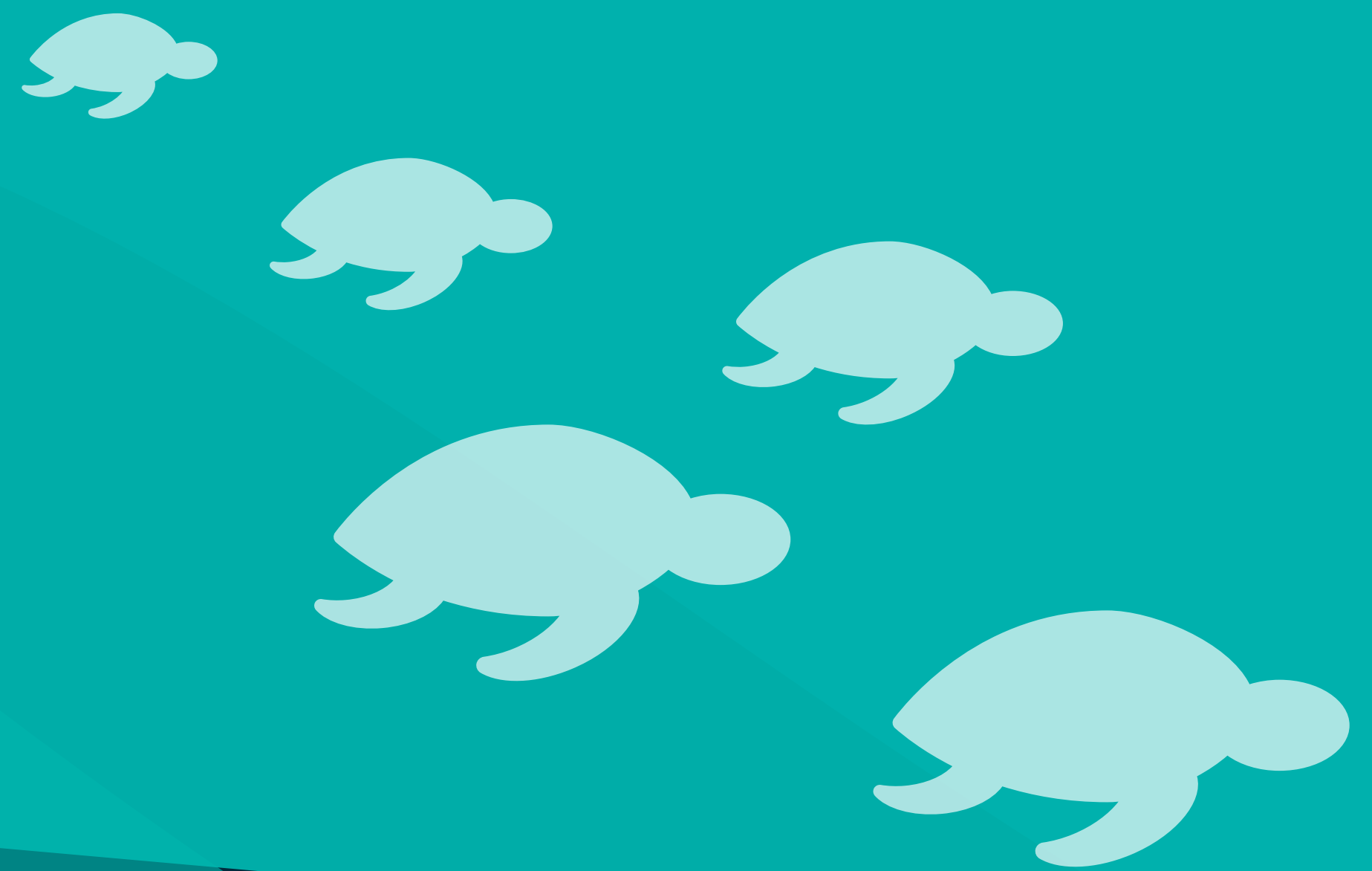
RELOCATION METHODS

WHY: Clutches of eggs unlikely to successfully incubate (doomed eggs) were relocated to safer incubation sites either higher up the dunes or to an adjacent dark beach in response to the identified threats; risk of flooding or erosions during incubation², or where coastal lighting is likely to disrupt hatchling ocean finding behaviour.

HOW: Eggs are relocated to artificial nests that are 55-60cm deep with a 50cm radius “body pit” from which groundcover vegetation (typically *Spinifex sericeus*) was cleared to replicate the natural nest environment. Eggs were relocated within 2 hours or after 21 days of oviposition and with the minimum rotation³.

WHERE: Doomed clutches of eggs are relocated at beaches throughout Queensland and New South Wales to support endangered species population recovery.

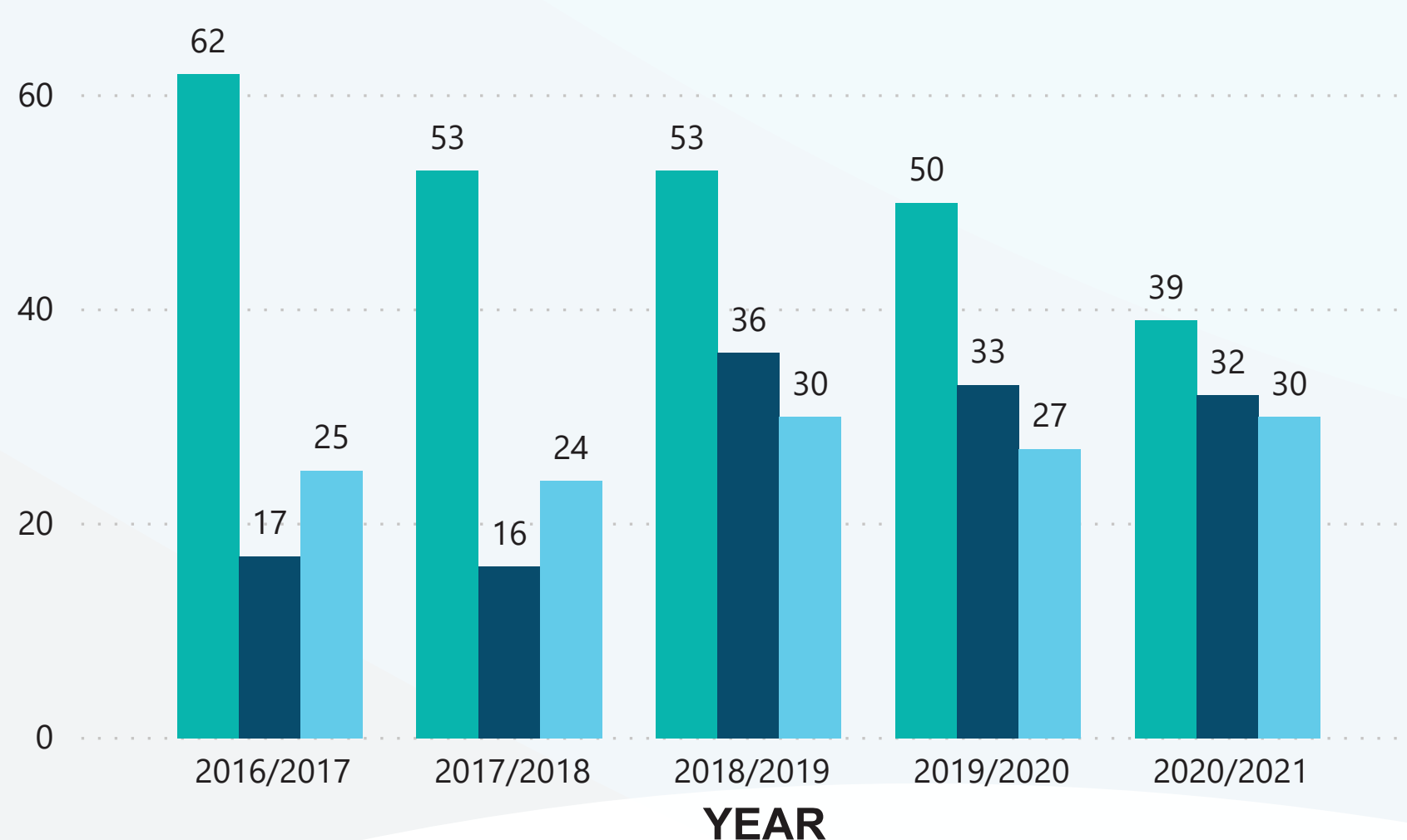
WHO: Only persons trained and authorised under the Nature Conservation Act are able to relocate turtle nests.



SUMMARY OF RELOCATION AND SUCCESS DATA 2005–2020

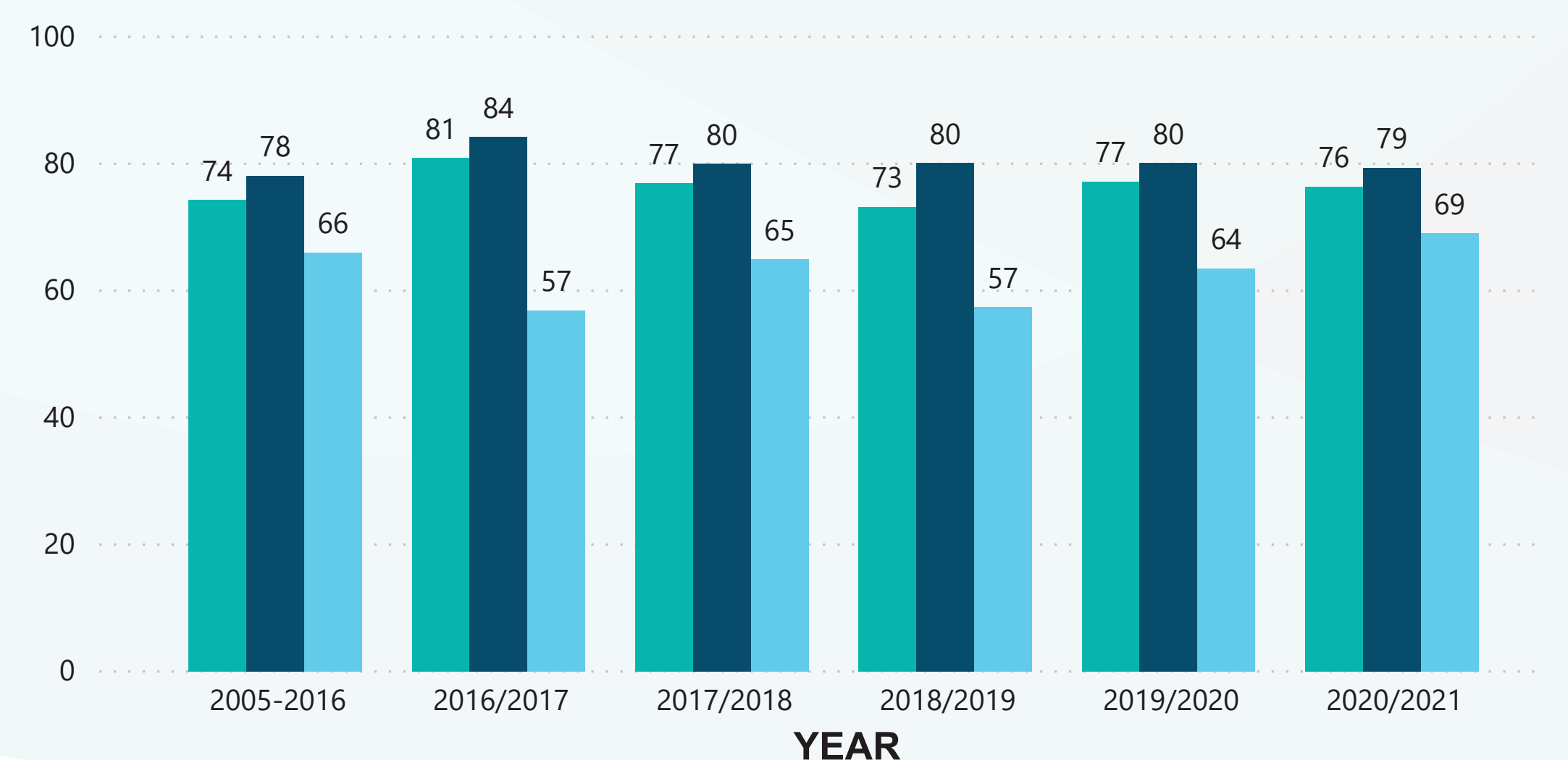
SOUTH SUNSHINE COAST SUMMARY NESTS 2016–2020

● NESTS ● RELOCATION ● TURNAROUND



SOUTH SUNSHINE COAST NEST SUCCESS 2005–2020

● AVERAGE EMERGENCE SUCCESS % ● AVERAGE HATCH SUCCESS % ● AVERAGE PERIOD TO EMERGENCE



1. Kate HOFMEISTER, Helen TWADDLE, Julie O'CONNOR, Colin J. LIMPUS, Bribie Island Turtle Trackers, TurtleCare Sunshine Coast Volunteers and Coolumb and North Shore Coast Care Volunteers (2019). Marine Turtle Nesting Populations: Sunshine Coast Region 2005–2016. Caloundra: Sunshine Coast Council. 44pp.

2. Pfaller, J. B., Limpus, C. J., & Bjorndal, K. A. (2008). Nest-site selection in individual loggerhead turtles and consequences for doomed-egg relocation. Conservation Biology.

3. Limpus, C. J., Baker, V., & Miller, J. D. (1979). Movement induced mortality of loggerhead eggs. Herpetologica 35, 335-8.

University of Sunshine Coast's Community engagement evaluation of TurtleCare



Results from critical review report of the citizen science within TurtleCare, focused on program aims and objectives, volunteer and community involvement, and the identification of potential program gaps¹.

TURTLECARE IS BUILT OF MORE THAN 200 DEDICATED VOLUNTEERS INTEGRAL TO THE PROGRAM'S SUCCESS

A successful citizen science-based program aims to give participants a voice to determine program activities, influence policies that may ultimately affect their lives and generates a sense of custodianship by providing opportunities for learning, builds capacity and enhances responsibility.



237 respondents from five stakeholder groups, central to the TurtleCare Program, were examined:

- sectional leaders
- volunteers
- residents
- local businesses
- divisional councillors.

Volunteer expectations were met and TurtleCare was achieving its objectives.

Sixty-seven of the 74 participating volunteers (92%) indicated their expectation had been met as a TurtleCare volunteer. Almost 95% of participants were either very satisfied (60%; n=44) or satisfied (34%; n=25) being TurtleCare volunteers.

Majority of residents knew actions could be taken to engage in turtle conservation.

Respondents suggested community awareness of the TurtleCare program is high (90%, n=165).

The awareness of sea turtle nesting on Sunshine Coast beaches by participating residents was high, (94%; n=136) with approximately three quarters (74%; n=107) of participating residents aware of what actions could be taken to protect marine turtles.

STRENGTHS

- High quality training with knowledge and experience and Council support creating a positive environment.
- Citizen science data informing policy planning and scientific research.
- The dedication and commitment of volunteers creating a sense of community and belonging.

OPPORTUNITIES

- Recognition of volunteer efforts and communication around political developments.
- Community Engagement and local community education.
- Recognition and implementation of coastal habitat protection measures.

1. V. Schaffer (2018). Community Engagement Evaluation of the TurtleCare Program. Sunshine Coast Council.