

Conservation initiatives for turtle hatchlings

Table 1 Conservation initiatives to improve turtle hatching survivability

| Conservation initiative and jurisdiction | Source | Information on conservation effort | Result of conservation effort |
|--|---|---|--|
| Government conservation initiative. Sunshine Coast Council. | Sunshine Coast Council, Turtle light study Buddina and Mudjimba , n.d., accessed 27 January 2026. | <p>In 2021 the Sunshine Coast Council began trialling turtle friendly lighting:</p> <p><i>In 2021, Council collaborated with the University of Sunshine Coast and the Department of Environment and Science to test several commercially available turtle sensitive lights and their impact on turtle behaviour at Mon Repos, Bundaberg.</i></p> <p><i>The study identified one type of light that had reduced impacts to turtles.</i></p> <p><i>We are now trialling this light at two locations (Buddina and Mudjimba) and in addition have fitted them with motion activation sensors, which switch on only when people are within 100m2 of the light.</i></p> | <p>According to an article published in ABC News:⁶</p> <p><i>Praising the changes, Sunshine Coast regional council conservation officer Kate Hofmeister said a record 36 endangered loggerhead turtle clutches had already been laid on Buddina Beach this nesting season. And while turtle breeding cycles do vary over the years, Ms Hofmeister believed that the lighting had “made a big difference.”</i></p> |

⁶ J Nichols & A Bagshaw, '[Street lights were luring endangered turtle hatchlings to their deaths until this happened](#)', ABC News, 9 February 2023

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| | | <p>ABC News reported on the Council's conservation efforts:⁵</p> <p><i>Light pollution had increased from streetlights, high-rise buildings, and the headlights of parked cars at the Point Cartwright lookout.</i></p> <p><i>To restore the "dark beach" that nesting marine turtles preferred, Sunshine Coast Council installed motion-activated street lighting, light shields, timers, and reflective signage in the car park that asks people to switch off their headlights.</i></p> | |
| Community conservation initiative. Raine Island, Great Barrier Reef. | <p>Queensland. Department of the Environment, Tourism, Science and Innovation,</p> <p>Groundbreaking turtle egg relocation offers hope in a changing climate [media</p> | <p>Conservation initiative to relocate turtle nests to higher ground:</p> <p><i>In an Australian first at this scale, more than 3,000 green turtle eggs were successfully relocated last summer [2024-25] from Raine Island to Sir Charles Hardy Islands (Wuthathi National Park</i></p> | <p>Successful results of turtle nest relocation:</p> <p><i>The 70% hatching rate at the Sir Charles Hardy Islands showed relocation was a viable method. The trial sets the stage for new cooling techniques aimed at producing more males.</i></p> |

⁵ J Nichols & A Bagshaw, '[Street lights were luring endangered turtle hatchlings to their deaths until this happened](#)', ABC News, 9 February 2023

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| | release], 19 November 2025 | <p><i>(CYPAL) to test whether large numbers of turtle eggs can be moved in remote locations to achieve better hatching outcomes.</i></p> <p><i>While Raine Island is the world's largest green turtle rookery, its nesting beach can be inundated during high tides—drowning eggs when nests are submerged for long periods. Beach reprofiling at the island has been highly successful in mitigating this threat, however risks remain under projected sea level rise. In addition, climate change has caused sand at Raine Island to become too warm for male hatchlings to develop. The sex of baby green turtles is determined by nest temperature—leading to a shortage of juvenile males in the northern Great Barrier Reef.</i></p> | <p><i>Building on this success, a second egg relocation trip has just returned, transferring 50 clutches of eggs. Shade structures have been installed over the relocated nests to lower sand temperatures and boost male hatchling production.</i></p> |
| Government conservation initiative. Queensland. | Queensland. Department of the Environment, Tourism, Science and Innovation, ' Nest to | The Nest to Ocean Turtle Protection Program has been operating since 2014. The program supports active nest protection and predator control efforts. | The Queensland Government has reported on the following program: <i>More than 40,000 turtle nests have been monitored by Nest</i> |

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| | Ocean Turtle Protection Program , <i>Pest plants and animals and pathogens</i> , 20 May 2024. | Natura produced a documentary highlighting the various conservation efforts supported through funding from Nest to Ocean Program. This can be accessed here . | <i>to Ocean grant recipients, and the program has consistently achieved greater than 90% nest survival because of the predator control activities and direct nest protection. In total, it is estimated that approximately 2.5 million hatchlings have been protected since the inception of the program.</i> |
| Community conservation initiative. Wreck Rock. | Turtle Care Volunteers Queensland Inc, Wreck Rock Turtle Monitoring Project , n.d., accessed 20 January 2026. | <i>Turtle Care Volunteers Queensland Inc is an incorporated association established for the purpose of fostering conservation through study and enjoyment of turtles.</i> The Great Barrier Reef Foundation produced a documentary on the conservation initiative undertaken by Turtle Care. The video can be accessed here . | The impact of Turtle Care Volunteers Inc citizen science projects has been reported on by the Great Barrier Reef Foundation: ⁷ <i>Monitoring teams covered more than 30,000 kilometres over the two nesting seasons, patrolling the beach at night to monitor and record turtle nesting and hatching activity, and returning each day to install and maintain predator exclusion devices, photograph and record activity.</i> |

⁷ Great Barrier Reef Foundation, '[Citizen Science project wrap: Stories of impact](#)', *News*, 19 October 2021.

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| | | | <p><i>More than 400 egg clutches were protected or saved during the nesting seasons, through keeping out predators such as foxes and goannas or moving nests to higher ground if they were at risk of inundation.</i></p> <p><i>Maintaining long-term records is hugely valuable, as it helps drive the change needed to address evolving local threats to turtle populations. For example, the team observed increasing pressure on turtle nesting habitat from beach-going vehicle traffic in recent years. As a result of community action and Nev and Bev's long-term records, the jurisdiction of the beach esplanade has recently shifted to the state government, empowering greater regulatory action on beach activities. Vehicles are now excluded from the beach at one end of the national park – with Turtle Care one of the</i></p> |

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| | | | <i>many organisations advocating for improved protection of this important turtle breeding location.</i> |
| Community conservation initiative. Noosa. | Noosa biosphere, ' Clean Up for the Hatchlings 2026 ', n.d., accessed 21 January 2026. | <p>Community organised beach cleaning event for January 2026:</p> <p><i>Help protect Noosa's future marine life by joining Clean Up for the Hatchlings 2026, a free community event inviting locals and visitors to come together to clean our beaches ahead of the turtle hatching season.</i></p> <p><i>Each year, hatchling turtles rely on clean, safe beaches to make their first journey to the ocean. This event plays an important role in reducing plastic pollution and marine debris, helping to protect wildlife and preserve the natural values of the Noosa Biosphere.</i></p> <p>Further information on the initiative can be found here.</p> | |

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| <p>Community conservation initiative. Raine Island.</p> | <p>Great Barrier Reef Foundation, 'Raine Island Recovery Project', <i>What we do</i>, n.d., accessed 21 January 2026.</p> | <p>90% of the Great Barrier Reefs northern turtle population comes from Raine Island. More than 64,000 green turtles have been recorded nesting on Raine island in one nesting season alone.</p> <p>The Rain Island Recovery Project aims to restore this green turtle nesting area. This involves:</p> <ul style="list-style-type: none"> • <i>Installing fencing to reduce fatal cliff falls.</i> • <i>Moving sand to create room for nesting.</i> • <i>Rescuing fallen and trapped turtles</i> • <i>Tracking turtles thousands of kilometres to learn more about how to help them.</i> • <i>Keeping endangered nests safe</i> • <i>Protecting and restoring a vital ecosystem.</i> | <p>Since the project has started the following milestones have been achieved:</p> <ul style="list-style-type: none"> • 40,000 cubic metres of sand moved to raise the nesting beaches. • 35,000 cubic meters of beach has been reprofiled. • Doubled the amount of nesting areas above tidal inundation. • 5 years reprofiled beaches remain stable five years into the project. |

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| Government conservation initiative. Sunshine Coast. | Sunshine Coast Council, Sunshine Coast marine turtle conservation plan 2023-2033 , August 2023. | <p><i>The Sunshine Coast Council Marine Turtle Conservation Plan supports efforts by the Queensland and Australian Governments to stop the decline of depleted stocks, support recovery and maintain functional populations of marine turtles on the Sunshine Coast through managing threats to population viability.</i></p> <p>The Conservation Plans primary goal is:</p> <p><i>Supporting the recovery of self-sustaining populations of marine turtles on the Sunshine Coast by reducing threats, improving habitat quality and strengthening community based management.</i></p> | <p>The implementation plan can be accessed here. The three desired outcomes from the regional conservation plan include:</p> <ul style="list-style-type: none"> • <i>Turtle-sensitive lighting and coastal development,</i> • <i>Regional Marine Turtle Recovery Actions</i> • <i>Community-based TurtleCare Program Delivery.</i> |
| Government conservation initiative. Australia | Australia. Department of the Environment and Energy, Recovery Plan for Marine Turtles in Australia 2017-2027 , 2017. | <p>The long-term recovery objective of the project:</p> <p><i>The long-term recovery objective for marine turtles is to minimise anthropogenic threats to allow for the conservation status of marine turtles to improve so that they can be removed from the</i></p> | <p>The progress of the plan will be considered at a five-year (mid-term) review of the plan and at the completion of the plan. The QPL has not been able to locate a copy of the mid-term review.</p> |

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| | | <i>EPBC Act threatened species list. [p 1].</i> | |
| Government conservation initiative. Australia | Australia. Department of Climate Change, Energy, the Environment and Water, ' National Light Pollution Guidelines for Wildlife ', <i>Biodiversity publications and resources</i> , 25 May 2023. | <p>Light pollution was identified as a high-risk threat in the National Recovery Plan for Marine Turtles in Australia 2017-2027:</p> <p><i>The development and implementation of best practice light management guidelines was identified as a key action for promoting the recovery of marine turtles [p 54].</i></p> <p>The following objective was provided in the guidelines:</p> <p><i>These guidelines provide technical information to guide the management of artificial light for the Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act) listed threatened and migratory species, species that are part of a listed ecological community, and species protected under state or territory legislation for which artificial light has been demonstrated to affect,</i></p> | |

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| | | <i>behaviour, survivorship or reproduction. [p 2].</i> | |

Source: Compiled by the QPL from sources as referenced.

Academic research into improving turtle hatchling survivability

Table 2 Scientific studies into improving turtle hatchling survivability

| Scientific study and location | Source | Information on conservation program | Results and notes on scientific study |
|--|--|---|---|
| Scientific study. Great Barrier Reef. | M Staines et al., ' Impact of heavy rainfall events and shading on the temperature of sea turtle nests ', <i>Marine Biology</i> , vol 167, 2020, pp 1-11 | Sea turtles have temperature-dependent sex determination. Turtles incubated in sand above 27.7-31 degrees are born female and those incubated below are born male: <i>There is concern around the world, that in the face of climate warming there will be increasing feminization of hatchling production due to a lack of phenotypic plasticity, which ultimately might lead to an absence of males and so localised extinction of populations. [p 2].</i> | See the following ABC article for further reporting on similar scientific studies: I Stunzner, ' Marine turtles' male drought has scientists seriously concerned about risk of population decline ', <i>ABC News</i> , 18 June 2022. |

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| | | <p>This study identified methods of artificially cooling turtle nests to increase the number of male hatchlings:</p> <p><i>Our results also show the potential for artificially cooling nests by applying a combination of shade and irrigation, to counter the expected increases in the feminisation of sea turtle hatchling production worldwide.</i></p> | |
| <p>Scientific study. Spain</p> | <p>S Abalo-Morla et al., ‘Survival and dispersal routes of head-started loggerhead sea turtle (Caretta caretta) post hatchlings in the Mediterranean Sea’, <i>Marine Biology</i>, vol 165, March 2018, p 51.</p> | <p>This study analyses the benefit of ‘head-starting’ programs. Head-starting is the captive rearing of turtle hatchlings to avoid high mortality rates of turtle hatchlings in their first years:</p> <p><i>The head-starting technique is a frequent way of enhancing wildlife populations. There is evidence that head-started sea turtles can survive to adulthood and contribute to nesting events. Nevertheless, head-starting programs might not always be as successful as expected, since several constraints like behavioural anomalies, lower growth rates or illness during the captivity period may limit the</i></p> | |

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| | | <p><i>survival of post-hatchlings before and after release into the wild. Evaluating the success of head starting programs in sea turtles is challenging due to their long age to maturity. One approach to assessing the short-term success of these programs is to evaluate the survival rate of reintroduced post-hatchlings during the first few months after release when their prospects of survival are expected to be the lowest. However, assessing the survival of post-hatchlings directly is challenging, and one of the major gaps in our knowledge of sea turtle population dynamics. [p 51].</i></p> | |
| <p>Scientific study. Sunshine Coast.</p> | <p>J O'Connor et al., 'Anti-predator meshing may provide greater protection for sea turtle nests than predator removal', <i>PLoS One</i>, vol 12, 10 February 2017.</p> | <p>This article analyses the impact of anti-predator meshing on turtle hatchlings:</p> <p><i>The protection of sea turtle nests from terrestrial predators is a problem in many countries. [p 1]</i></p> <p><i>In eastern Australia in recent decades the fox has been the most significant terrestrial</i></p> | <p>The following impact of introducing anti-predator meshing was recorded:</p> <p><i>Although standard mesh was applied to all known nests every year in both Periods 1 and 2, in all years except 2011 a number of nests remained undetected until hatchling emergence and hence were unmeshed for the duration of</i></p> |

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| | | <p><i>predator of sea turtles at the egg and hatchling stages. [p 2]</i></p> <p><i>Two impact mitigation methods were implemented: (i) lethal fox control through trapping and den fumigation; and (ii) meshing to exclude foxes from turtle nests. The study occurred over 10 nesting seasons, separated into Period 1 (2005-2009) and Period 2 (2010-2014). Lethal fox control was undertaken in Period 1, and no fox control occurred during Period 2. Meshing occurred throughout both periods. [p 4]</i></p> | <p><i>incubation (range 3±31%) (Table 1). Of the 391 nests detected over the period of this study, 54 were recorded as breached by foxes during incubation and/or emergence. A further 14 nests were untouched by foxes during incubation and emergence but were disturbed after successful nest emergence. [p 6].</i></p> <p><i>The observed reduction in the depredation of turtle nests in Period 2 was somewhat counter intuitive given that one might expect a higher level of clutch depredation in the period when no lethal fox control was undertaken. The Period 1 results showed that meshing played an important role in protecting nests from clutch depredation by foxes. Results for Period 2 appear to indicate that the reduced clutch depredation was not attributable to nest meshing. However, these results should</i></p> |

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| | | | <p><i>be interpreted cautiously. [p 6].</i></p> <p><i>In this regard, the timely introduction of the impenetrable lattice FED may have contributed to foxes learning to ignore an interesting potential food odour that was consistently proving to be unobtainable. Although the lattice FEDs are no longer used, their deployment in the 2011 season may have played an integral role in the observed changes in nest predation in subsequent seasons. [p 8].</i></p> |
| Scientific study. Cabo Verde. | D Sousa-Guedes et al., ‘Plastic pollution can affect the emergence patterns of loggerhead turtle hatchlings’ , <i>Animal Conservation</i> , vol 26, August 2023, pp 492-501. | Study analyses the impact of plastic debris on turtle nests: <p><i>Turtles’ nesting habitats are under serious threat, due to coastal development, plastic pollution and sea-level rise. Our preliminary results show that plastic accumulation on nests’ surfaces might decrease the emergence success of hatchlings, with nests with a high volume of plastic having a lower probability</i></p> | The study provided the following recommendations: <p><i>With the information gathered in this study, our recommendations for the plastic problem on those beaches rely on better local waste management, empowering local communities through the implementation of educational activities and</i></p> |

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| | | <p><i>of hatchlings' successful emergence. Moreover, our results also show that plastics affect the synchronized emergence of hatchlings, with more scattered smaller groups in nests with higher accumulation. [p 497].</i></p> <p><i>Our results suggest that plastics on the sand affect the turtle hatchlings' probability of survival, by decreasing the emergence success and by changing the emergence pattern. Further, higher levels of plastics seem to increase the impact. However, these results need to be interpreted carefully and more studies are necessary to state more conclusions. It is also worth noting that other materials may have similar effects on the emergence and synchronization of turtle hatchlings. However, we did not evaluate the effects of natural debris or any other materials, as most marine debris reaching those beaches is composed of plastic. [p 498].</i></p> | <p><i>beach cleaning, which are only temporary solutions but can play a key in the protection of those ecosystems. As most plastics in Cabo Verde seem to come from the ocean, a world systematic change in waste management is essential.</i></p> |

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