

Western Basin Dredging and Disposal Project (EPBC 2009/4904)

Environmental Performance Report December 2021

For the attention of: The Department of the Agriculture, Water and Environment



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Cover Photos :

1. Colin J. Limpus, Nancy N. FitzSimmons, and Milani Chaloupka (2021). Flatback Turtle, *Natator depressus*, Seven Year Review: 2013/14 – 2019/20 Breeding Seasons at Curtis, Peak and Avoid Islands. Brisbane: Department of Environment and Science, Queensland Government. Report produced for the Ecosystem Research and Monitoring Program Advisory Panel as part of Gladstone Ports Corporation’s Ecosystem Research and Monitoring Program.

2. Colin J. Limpus, Nancy N. FitzSimmons, Ian Anderson, Leisa Baldwin, Wayne Bennet, Leisa Fien, Fiona Hoffmann, Erwin Hoffmann, Duncan J. Limpus, and Trevor Turner (2021). Monitoring of eastern Australian flatback turtle, *Natator depressus*, breeding populations in the Gladstone region: 2020-2021 breeding season. Brisbane: Department of Environment and Science, Queensland Government. Report produced for the Ecosystem Research and Monitoring Program Advisory Panel as part of Gladstone Ports Corporation’s Ecosystem Research and Monitoring Program.

3. Pers. Communication Danielle Cagnazzi (Assessment of Toxicological Status of Australian Humpback and Australian Snubfin Dolphins in the Port Curtis and Port Alma, 2020)

Executive Summary

The 2021 Environmental Performance Report (EPR) has been prepared to comply with the following conditions of the Western Basin Dredging and Disposal Project (WBDDP) *Environmental Protection and Biodiversity Conservation Act* (EPBC Act) Approval 2009/4904:

Condition 36

Ecosystem and Research Monitoring Program (ERMP)

The person taking the action must submit to the Minister an Annual Environmental Performance Report covering the following topics:

- a) Dolphins, dugong and marine turtles, and other megafauna;*
- b) Migratory shorebirds; and*
- c) Seagrass.*

Condition 37

ERMP

12 Months from the date of approval, a report must be submitted outlining the initial environmental activities for the 12 month period. The report is to be called the Environmental Performance Report and must be submitted within 42 days of the 12 month activity period. The Environmental Performance Report must include proposed environmental management improvements to be implemented through the DCMP, WQMP and other Plans as relevant. Reports are required annually from thereafter.

The 2021 EPR covers the period from 1 November 2020 to 31 October 2021 and includes the outcomes of the studies conducted under the ERMP. Table 1 provides a status update on the progress of the projects in the current reporting period.

Appendix 1 provides the extent of the ERMP bioregion.

In the current reporting period one (1) ERMP Advisory Panel (ERMPAP) meeting was held, details of which are presented in Table 2.

Records of formal communication with the Department of Agriculture, Water and Environment (DAWE) in the current reporting period is presented in Table 3 and future action is captured in Table 4.

One peer-reviewed publication titled “*Combining analytical and in vitro techniques for comprehensive assessments of chemical exposure and effect in green sea turtles (Chelonia mydas)*” was published in this reporting period (Table 5).

In 2021, progress of many projects (Appendix 2) and the submission of reports has been impacted by restrictions imposed by COVID-19. Extensions have been provided to some of the projects. This has influenced the ERMP timeline (Appendix 3) and the ERMPAP has recommended that the ERMP be extended for one (1) more year (October 2022) so that all project deliverables can be achieved. This recommendation has been accepted by GPC and communicated with DAWE.

Table 1: Status update on the ERMP projects in the current reporting period (1 November 2020 to 31 October 2021)

Project Name	Objective	Timeline	Status	Documents
Marine turtle nesting populations: Avoid, Peak and Curtis Island Flatback Turtles.	To conduct an annual mid-season census (tagging census) of nesting flatbacks at index beaches within the Eastern Australian genetic stock in the Gladstone regions: Curtis, Wild Duck and Peak Islands	2013-2022	<ul style="list-style-type: none"> • A two week mid-season census was conducted at Wild Duck, Peak and Curtis islands in 2020-2021 (last week of November and first week of December 2020). • Emergence success was monitored in January and February 2021. • GPC is awaiting the submission of the Final report. • With the completion of the last round of monitoring in December 2020/2021, the field work for this program has been completed. • A Summary report analysis population trends of nesting turtles at Curtis, Avoid and Peak Islands will be submitted to GPC. 	Flatback nesting turtles on Curtis, Peak and Wild Duck islands Milestone 18: field plan (#1664549)
Increase the Understanding of the Green Turtle Population in Port Curtis	To obtain information pertaining to Green turtles for the period from 2015 to 2019 inclusive of size, sex, maturity, growth rates, survivorship,	2016-2022	<ul style="list-style-type: none"> • The fieldwork for his program was conducted from 2016 to 2019 during which 1232 separate foraging Green turtles were captured by Rodeo Technique and their health condition assessed. • Foraging Green turtles aggregated primarily in five (5) areas within Port Curtis that were 	Final report due in early 2022

Project Name	Objective	Timeline	Status	Documents
	<p>recruitment and general health of the green turtle population in Port Curtis and the Narrows.</p>		<p>characterised by being adjacent to outflows from rivers and creeks or, in the case of the Pelican Banks, with outflow from the Port where there is regular reversal of strong tidal currents and associated settlement of sediments to form wide shallow flats supporting seagrass and algal pastures.</p> <ul style="list-style-type: none"> • Key areas where congregation of foraging Green turtles were observed were Colosseum Creek, Boyne River, South Trees Inlet, Calliope River. • The final report from this study has been received by GPC and is under review. 	
<p>Assessment of Toxicological Status of Australian Humpback and Australian Snubfin Dolphins in the Port Curtis and Port Alma</p>	<p>The objective of this study is to improve our understanding of the toxicological status of Australian Snubfin and Australian Humpback dolphins in Port Curtis and Port Alma survey areas.</p>	<p>2019-2022</p>	<ul style="list-style-type: none"> • This study included collection of biopsy samples from Australian Humpback and Australian Snubfin dolphins in Port Curtis and Port Alma. • These samples were to be tested for persistent organic pollutants inclusive of pesticides and heavy metals. • Sampling for the project commenced in July 2020 and continued until October 2020. However, during this sampling period only three (3) biopsy samples could be collected though quite a few dolphins were observed but they were approached for sampling they went underwater and moved away outside the sampling perimeter. 	<ul style="list-style-type: none"> • Env ERMP CS19000106 Report Population Dynamics of Humpback and Snubfin dolphins in Port Curtis and Port Alma 2020 (#1743947)

Project Name	Objective	Timeline	Status	Documents
			<ul style="list-style-type: none"> • Despite repeated sampling efforts, no additional biopsy samples could be collected. • In 2021 surveys were again planned in March, June and July however due to COVID -19 restrictions these surveys could not be completed. The ERMPAP recommended that from the three (3) biopsy samples collected no meaningful interpretation of the toxicological status of the dolphins could be assessed. • A report on the population of the Australian Humpback and Australian Snubfin dolphins in Port Curtis and Port Alma has been delivered under this project, which is currently under review by the ERMPAP. 	
<p>Assessing the impact of Reclamation Activities on Migratory Shorebirds at the Western Basin Reclamation Area (WBRA)</p>	<p>The objective of the study was to record the numbers of shorebirds in the WBRA over the high tide period on a fortnightly basis tentatively from December 2019 to December 2020</p>	<p>2019-2021</p>	<ul style="list-style-type: none"> • In 2019, GPC undertook the Clinton Vessel Interaction Project (under a separate approval) whereby 800,000m³ of dredge material was placed in the WBRA. • This activity provided an opportunity to study the impact of bund filling activities on shorebirds. • A total of 24 shorebird surveys were conducted at the WBRA at high-tide in the period between December 2019 and January 2021. • Counts of migratory shorebirds belonging to 15 species ranged from 14 to 1,723 birds per survey. The most abundant species, listed in 	<p>Final report “Assessing the Impact of Reclamation Activities on Migratory Shorebirds at the Western Basin Reclamation Area 2020” (# 1684048)</p>

Project Name	Objective	Timeline	Status	Documents
			<p>descending order, were Red-necked Stint, Sharp-tailed Sandpiper, Curlew Sandpiper and Eastern Curlew.</p> <ul style="list-style-type: none"> • Counts of non-migratory shorebirds belonging to 7 species ranged from 7 to 292 birds per survey. The most abundant species was Red-capped Plover. • The study concluded that the industrial activities (heavy truck traffic, dust, noise, machinery, spreading of dredged material on land) had little effect on the shorebirds roosting in the vicinity. They seemed to quickly adapt to the activity changes on site by moving between the cells and the wetland. On the other hand, it was observed that the shorebirds were chased away when people, such as trespassing public, were moving on foot in the proximity of their roosts. • The final report for this project has been accepted by the ERMPAP and this project has now concluded. 	
<p>Monitoring the survival and recovery of shorelines, specifically Tidal Wetlands (Mangroves/Saltmarsh/Saltpans)</p>	<p>The objective of the study is to generate essential baseline data, including comparisons with historical information, as the basis for</p>	<p>2014-2022</p>	<ul style="list-style-type: none"> • The field work for the study was completed in 2019. • Quantification of mapped measures of condition of mangroves is in progress inclusive of assessment and compilation of field observation data. 	<p>Final Project Report Due in March 2022.</p>

Project Name	Objective	Timeline	Status	Documents
	evaluations of environmental condition and change in mangroves and Tidal wetlands from Port Alma to Rodds Bay.		<ul style="list-style-type: none"> The Final Report for this project is due by March 2022. 	
Migratory Shorebird Monitoring: Correlates of changing shorebird numbers	Design and conduct an analysis to determine how changing environmental conditions are related to the changing abundances and distributions of migratory shorebirds within the study area over the data collection period (2011 to 2020), involving (i) distinguishing local drivers of change (those operating within the ERMP region) from remote drivers (those operating outside the	2021-2022	<ul style="list-style-type: none"> Phase 1 report “Migratory shorebird population trends in the Gladstone region” has been received by GPC. The trend analysis depicts statistically significant declines in three (3) species of migratory shorebirds Eurasian Whimbrel, Far Eastern Curlew, and Bar Tailed Godwit. The declines of Far Eastern Curlew and Bar-tailed Godwit in the Gladstone region matched the conclusion of significant national declines, and regional declines in Australia north of -27.8 degrees south previously shown by Clemens et al. (2016). Previous regional analysis by Clemens et al. (2016) concluded that Lesser Sand Plover and Terek Sandpiper were declining in northern Australia, in contrast to their apparent stability in the Gladstone region suggesting that Gladstone may be a safe haven for these two (2) species. Phase 2 of the project which aims at identifying the plausible causes of variability in trends of 	“Interim Project Report, Phase 1: Migratory shorebird population trends in the Gladstone region” (1732923)

Project Name	Objective	Timeline	Status	Documents
	region, including overseas), and (ii) determining which drivers best explain changing numbers		the migratory shorebirds is currently under preparation.	
ERMP Synthesis Report	The purpose of this report is to synthesise the findings and outcomes of the ERMP that can be used to identify any potential impacts and inform adaptive management responses.	2019-2022	<ul style="list-style-type: none"> • Workshops held with ERMPAP to work through the structure of the Report. • The Panel members are contributing towards the development of the technical chapters. • The report will be finalised following completion of all programs under the ERMP. 	Report due by October 2022

Table 2: Record of ERMPAP Meetings in the current reporting period:

Date	Agenda	Recommendations
9 July 2021	To discuss the Dolphin Biopsy Sampling and Ecotoxicity Risk Assessment Project	<p>The ERMPAP considered that there were too few dolphin biopsy samples collected (post completion of multiple attempts to procure samples from July 2020 to March 2021) to warrant toxicological assessment; and that it would not be cost effective to analyse the three (3) samples, and no meaningful information on population dynamics could be gleaned from the data.</p> <p>The ERMPAP considered that the chance of improving the number of field samples for</p>

		<p>toxicological assessment was very low and recommended that the project be terminated.</p> <p>The ERMPAP recommended that Dr Cagnazzi write a report based on his field surveys to provide information on the population dynamics of humpback and snubfin dolphins in Port Curtis and Port Alma and compare the results with the previous population dynamics results conducted under the ERMP between 2014 and 2016.</p>
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Table 3: Communications with the Department of Agriculture, Water and Environment

Date	Content	Status
11/01/2021	Submission of the revised ERMP for Approval	Approved on 17 February 2021

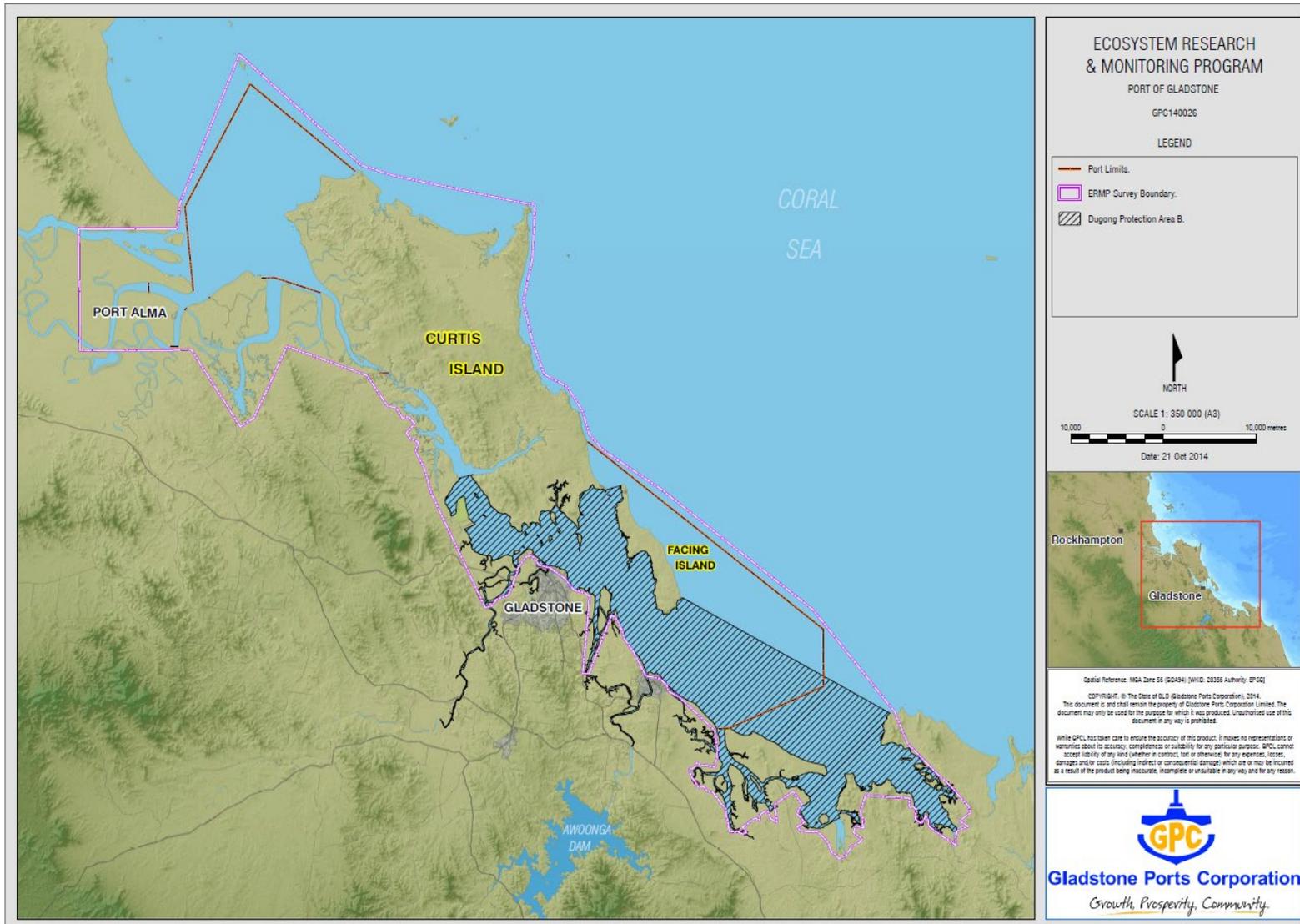
Table 4: Future Action

Action	Date
Completion of all ERMP programs	22 October 2022

Table 5: Publication

Combining analytical and in vitro techniques for comprehensive assessments of chemical exposure and effect in green sea turtles (<i>Chelonia mydas</i>)	Journal	Date
Kimberly A. Finlayson ^{a, *} , Frederic D.L. Leusch ^{a, b} , Cesar A. Villa ^c , Colin J. Limpus ^c , Jason P. van de Merwe ^a , https://doi.org/10.1016/j.chemosphere.2021.129752	Chemosphere	25 January 2021

Appendix 1: Geographical boundary of the ERMP



Appendix 2: Reports approved by the ERMPAP in 2020-2021

1. Assessing the Impact of Reclamation Activities on Migratory Shorebirds at the Western Basin Reclamation Area 2020 (# 1684048)
2. Flatback nesting turtles on Curtis, Peak and Wild Duck islands-Milestone 18: field plan (#1664549)
3. Interim Project Report, Phase 1: Migratory shorebird population trends in the Gladstone region (#1732923)

Appendix 3: ERMP timeline

ERMP timeline	2011	2012	2013	2014	2015	2016	2017	2018	2019		2020		2021		2022	
									Jan to June	July to Dec	Jan to June	July to Dec	Jan to June	July to Dec	Jan to June	July to Oct
<u>Projects</u>																
Baseline Studies																
Baseline Light Monitoring of Marine Turtles																
Shorebird Monitoring																
Marine Megafauna and Acoustic Monitoring																
Tier 1 gap Analysis Studies																
Central Queensland Corals and Associated Benthos: Monitoring review and gap Analysis																
Migratory Shorebird Monitoring Review																
Research, monitoring and management of seagrass ecosystems adjacent to port developments in central Queensland: Literature Review and Gap analysis																
Review of Water Quality Studies																
Review of Coastal Dolphins in Central Queensland, particularly Port Curtis and Port Alma regions																
Status of the dugong population in the Gladstone area																
Monitoring of Coastal Sea turtles Reports 1-6																
Loggerhead																

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ERMP timeline	2011	2012	2013	2014	2015	2016	2017	2018	2019		2020		2021		2022	
									Jan to June	July to Dec	Jan to June	July to Dec	Jan to June	July to Dec	Jan to June	July to Oct
<u>Projects</u>																
Green																
Hawksbill																
Olive Ridley																
Flatback																
Leatherback																
Tier 2 Projects																
Green Turtle population and Health study																
Monitoring Seagrass Seedbank Density and Viability within Port Curtis																
Monitoring the survival and recovery of shorelines, specifically Tidal Wetlands (Mangroves/Saltmarsh/Salt pans)																
Dugong feeding ecology and habitat use (dugong feeding trail assessment)																
Dugong tagging in collaboration with Green Turtle tagging and turtle population and health studies																
Migratory Shorebird Monitoring: Understanding Ecological Impact																
Migratory Shorebird Survey																
Dolphin Monitoring																
Turtle Nesting Populations on Curtis, Peak and Avoid Islands																
Green Turtle Satellite Telemetry																

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ERMP timeline	2011	2012	2013	2014	2015	2016	2017	2018	2019		2020		2021		2022	
									Jan to June	July to Dec	Jan to June	July to Dec	Jan to June	July to Dec	Jan to June	July to Oct
<u>Projects</u>																
Flatback Turtle Satellite Telemetry																
Green Turtle Blood analysis																
Monitoring of Coastal Lighting Effects on Marine Turtles																
Aquatic Ambient Noise Monitoring																
Study on the cause and health condition of beached dugong																
Monitoring of Australian humpback dolphins at Agnes Water to investigate distribution and movement patterns adjacent to the Gladstone Ports Corporation ERMP study area																
ERMP Synthesis Report																
Assessing the impact of Reclamation Activities on Migratory Shorebirds at the Western Basin Reclamation Area																
Toxicological assessment of Australian humpback and Australian Snubfin Dolphins																
Migratory Shorebird Monitoring: Correlates of changing shorebird numbers																
	Completed															
	In progress															
	Extension															