

## NORTH WEST RESORTS

# DBCA NINGALOO TURTLE PROGRAM DATA REVIEW: TECHNICAL NOTE



Prepared by

Pendoley Environmental Pty Ltd

For

North West Resorts

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## DOCUMENT CONTROL INFORMATION

**TITLE: DBCA NINGALOO TURTLE PROGRAM DATA REVIEW: TECHNICAL NOTE**

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### Document History

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## 1 BACKGROUND

Z1Z Resorts Pty Ltd proposes to construct and operate the Ningaloo Lighthouse Resort Project on North West Cape in Western Australia.

Z1Z Resorts Pty Ltd has requested a Subject Matter Expert (SME) undertake a desktop assessment of the Department of Biodiversity, Conservation and Attractions (DBCA) marine turtle nesting data to determine the presence and significance of marine turtle nesting activity on beaches surrounding the resort location. This Technical Note compiles the Ningaloo Turtle Program (NTP) nesting data for the past three seasons to:

- identify the species nesting there and their relative nesting effort;
- assesses the relative importance of the individual nesting beaches in the vicinity of the development location for each species; and
- determine if the Artificial Light Management Plan and risk assessment requires updating following a review of the NTP data.

Note:

1. This report is based on raw data supplied by the NTP only; no statistical analysis has been carried out on the data.
2. This review is limited to the three seasons of data presented and does not account for any potential longer-term trends in nesting effort and distribution.

### 1.1 Data Sources

Information on the local nesting beach activity has been provided by the DBCA to Pendoley Environmental under data sharing agreement (**Appendix A**).

The NTP data has been collated from the volunteer based track census program managed by DBCA Exmouth. The Cape Conservation Group (CCG), DBCA, Murdoch University, and WWF Australia developed the NTP to contribute to the conservation of marine turtles and their associated habitats. The program is sponsored by Woodside Energy Ltd and BHP.

The monitoring program aims to collect track data from the NW Cape Division, which includes the Lighthouse Bay beaches and the Ningaloo coast beaches (**Table 1** and **Figure 1**), over the 28 days of the peak nesting season (for green/flatback/loggerhead turtles) and three weekends of monitoring pre and post the peak nesting period. The survey dates for each season are shown in **Table 2**. The NTP only focusses on adult nesting activity and does not collect data on hatchling orientation.

## 2 NESTING SPECIES AND NESTING CYCLES

The two beach sections directly adjacent to the Lighthouse Resort location, and potentially at greatest risk from impact from the resort, are in the Lighthouse Bay region and include Mildura Wreck to Surf Beach and Surf Beach to Hunters Beach (**Figure 1**). The Ningaloo coast beaches are on the west side of North West Cape and include all the beach sections between Hunters and Trisel (**Figure 1**).

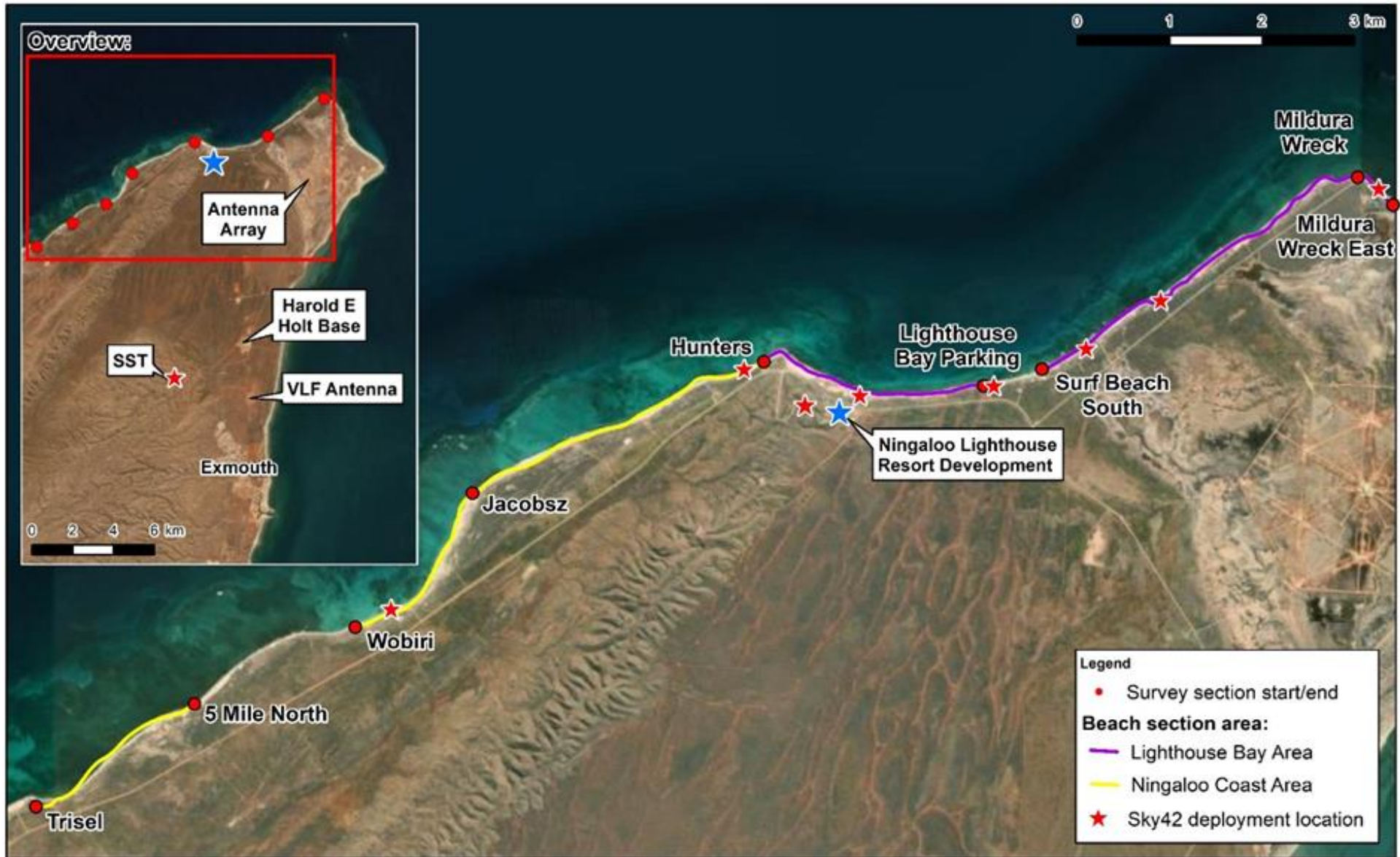
**Table 1: Beach sections surveyed by the NTP.**

Region	Beach section
<b>Lighthouse Bay beaches</b>	Mildura Wreck to Surf Beach
	Surf Beach to Hunters
<b>Ningaloo coast beaches</b>	Hunters to Mauritius
	Mauritius to Jacobz South
	Jacobz South to Wobiri
	Five Mile North to five Mile Carpark
	Five Mile Carpark to Trisel

**Table 2: Dates that beaches were surveyed the by NTP.**

Season	Survey dates
<b>2019/20</b>	23 & 24 November 2019
	7 & 8 December 2019
	16 Dec 2019 - 12 Jan 2020 (except 1 Jan)
	25 & 26 January 2020
	8 & 9 February 2020
	22 & 23 February 2020
<b>2020/21</b>	7 & 8 November 2020
	21 & 22 November 2020
	5 & 6 December 2020
	17 Dec 2020 - 13 Jan 2021 (except 1 Jan)
	30 & 31 January 2021
	13 & 14 February 2021*
	27 & 28 February 2021
<b>2021/22</b>	6 & 7 November 2021
	20 & 21 November 2021
	4 & 5 December 2021
	17 Dec 2021 - 13 Jan 2022 (except 1 Jan)
	29 & 30 January 2022
	12 & 13 February 2022
	26 & 27 February 2022

\*Survey period for Z1Z Resorts Pty Ltd Feb 2021 benchmark hatchling fan monitoring program



NWR Marine Turtle and Light Monitoring Program 2021

Figure 1: Location map of overall monitoring area including the extent of each beach section.



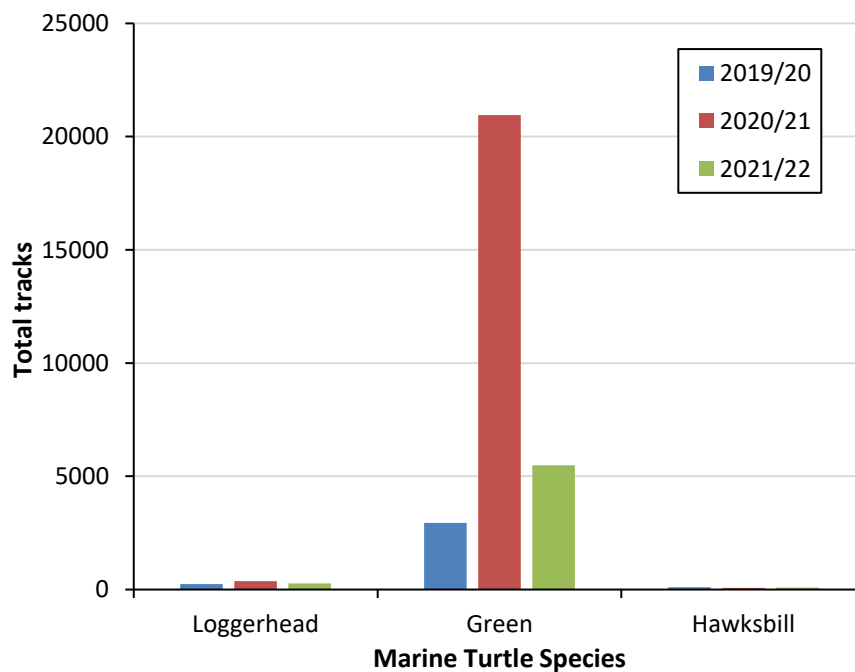
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The combined data for all three species for the beaches listed in **Table 1** are shown in **Figure 2**. This data confirms that:

- Green turtles are the dominant nesting species in the region, with nesting activity at several orders of magnitude higher than loggerhead and hawksbill turtles (**Figure 2**).
- Flatback turtles do not reliably and consistently use these beaches for nesting.
- The 2020/21 season recorded exceptionally high green turtle nesting activity (**Figure 2**).
- The timing of the first Z1Z Resorts Pty Ltd benchmark hatchling fan monitoring program was appropriate to maximise the collection of orientation data for the dominant nesting species, i.e. green turtles. The Z1Z Resorts Pty Ltd program collected orientation data in a large green turtle nesting year and at the peak of the hatchling emergence period.



**Figure 2: Summed NTP track census data for all monitored beaches combined.**

### 3 RELATIVE IMPORTANCE OF NESTING BEACHES

The number of tracks recorded during the NTP track census surveys over the three seasons are shown in **Figure 3**. The beach use as a measure of density, i.e. tracks per kilometre, are shown in **Figure 4**.

The distribution of raw turtle track counts across all surveyed beaches shows:

- All beaches are consistently favoured by green turtles.
- The Lighthouse Bay beaches had proportionally less green nesting effort than the Ningaloo coast beaches and this is particularly evident in the low nesting years (2019/20 and 2021/22). (**Figure 3**).
- When converted to density, the results suggest that the Lighthouse Bay beaches consistently support lower nesting effort compared to the Ningaloo coast beaches for green turtles.
- Five Mile to Trisel beach section reported the highest density of tracks (i.e. highest nesting effort) across all three years (**Figure 4**).
- Loggerhead and hawksbill turtle nesting effort is similarly low and much lower than for green turtles.
- There was no clear pattern in beach preference for loggerhead and hawksbill turtles in either the raw track data or when converted to track density, with track distribution spread randomly across beaches and seasons.

These results confirm that the Lighthouse Bay beaches immediately adjacent to the Lighthouse Resort are:

- marine turtle nesting habitat that is used by all three species (green, hawksbill, and loggerhead) consistently between and among seasons; and
- the Lighthouse Bay beaches are less favoured for nesting compared to other beaches on the North West Cape (based on density tracks as a measure of nesting for green turtles).

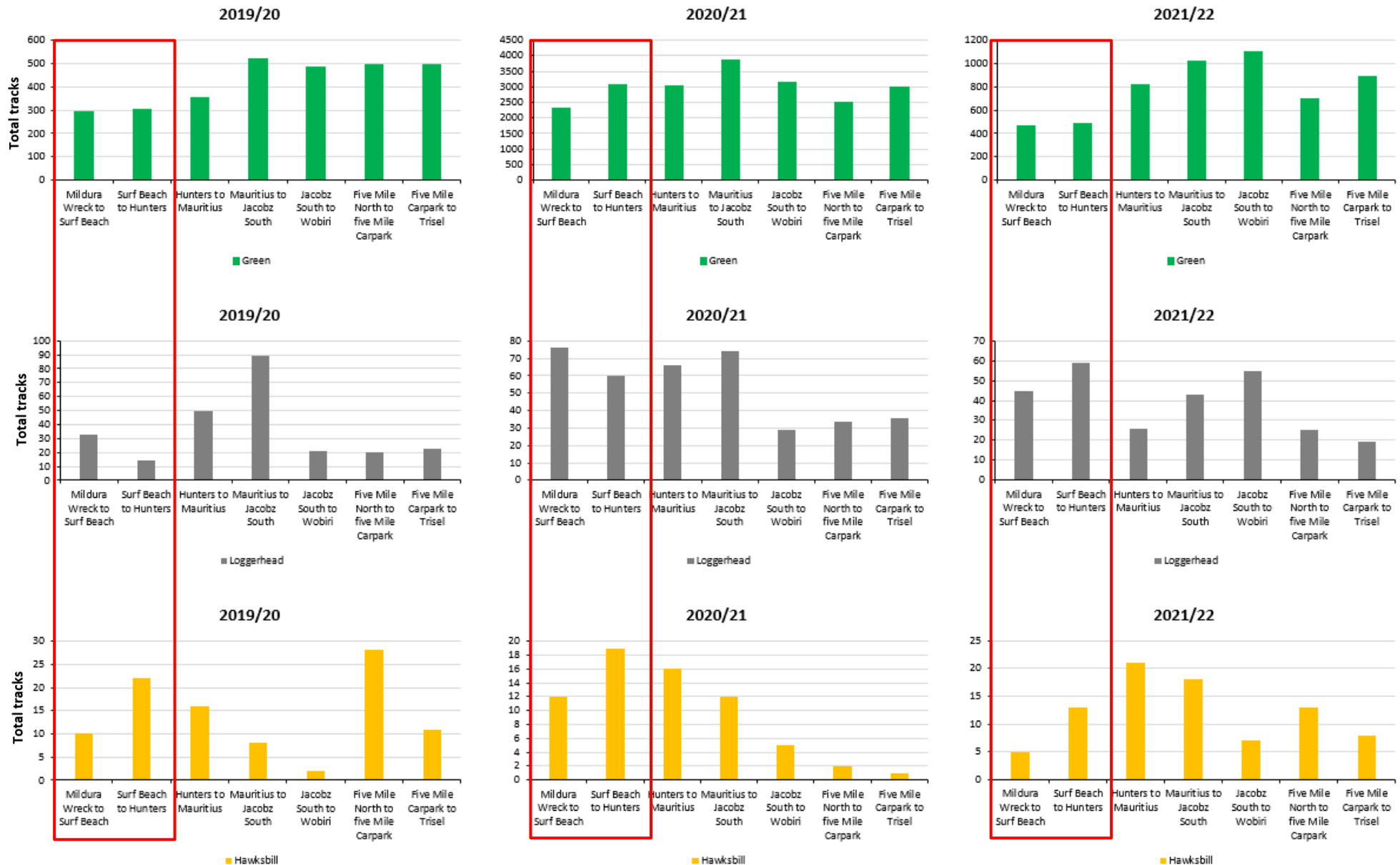


Figure 3: Green turtle (top panel), loggerhead turtle (middle panel) and hawksbill turtle (bottom panel) track counts on Lighthouse Bay (Mildura Wreck to Surf Beach, Surf Beach to Hunters, red box) and Ningaloo coast (Hunters to Triesel) beaches.



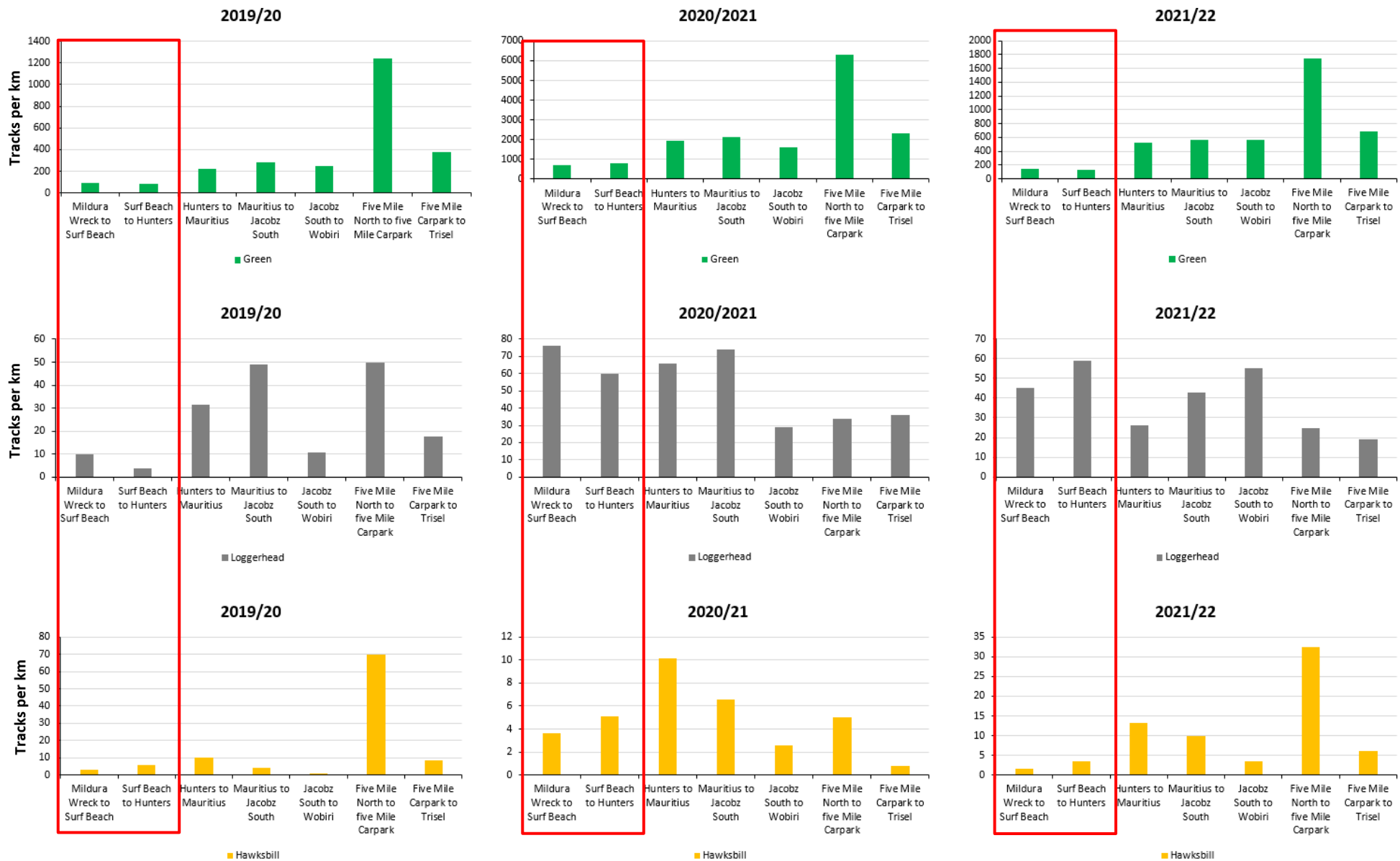


Figure 4: Green turtle (top panel), loggerhead turtle (middle panel) and hawksbill turtle (bottom panel) tracks per kilometer on Lighthouse Bay (Mildura Wreck to Surf Beach, Surf Beach to Hunters, red box) and Ningaloo coast (Hunters to Triesel) beaches.

## 4 RISK ASSESSMENT

There is nothing in this review of the NTP detailed data set that indicates the risk assessment conducted for the Lighthouse Resort Artificial Light Management Plan requires updating. The NTP data has confirmed that the beaches on Lighthouse Bay, which are already exposed to substantial light pollution from the Antennae Array, are less favoured by green turtles than the beaches of the Ningaloo coast which are shielded from that light by Cape Range.

The conservative approach taken in the initial risk assessment assumed the Lighthouse Bay beaches were of equal importance to marine turtle nesting as all other beaches in the North West Cape area between Mildura Wreck in Lighthouse Bay and Trisel on the Ningaloo coast, and consequently the risks were assessed in that context.

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