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Spatial distribution of shore-based fishers in the greater Perth Metropolitan area over summer 2010/2011

Final NRM Report – Project No. 09040

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1.0 Executive Summary

Aerial surveys are a useful technique for estimating numbers of recreational fishers. Following the success of a pilot study to examine the spatial patterns of recreational shore-based fishing activity in the Perth Metropolitan area from April – June 2010, another survey was conducted from December 2010 – February 2011 between Lancelin – Bunbury. More than 7,000 shore-based fishers were counted during 36 aerial flights, with significantly more recorded on morning and afternoon flights, when compared to those conducted at midday. Flights on weekends/public holidays also recorded more fishers than weekdays. The spatial distribution of fishers was variable along the coast, with sandy beaches at the northern and southern sections of the study area having high counts of fishers, along with groynes in the central section. Comparisons with the previous (autumn) study revealed that the northern beaches generally had higher numbers of shore-based fishers in summer, while those in the south had more during autumn. Data from this study assists with understanding the patterns of shore-based recreational fishing occurring along the greater Perth Metropolitan coast. Such information can be used to assist in the design of future on-ground surveys, compliance and education activities.

2.0 Introduction

Aerial surveys are often implemented to collect data on recreational shore and boat-based fishers across large study areas (Pollock et al., 1994). One of the strengths of this technique is that it can provide an instantaneous count of recreational fishers and, if a longitudinal survey design is implemented, seasonal differences in spatial distribution and number of fishers can be identified. These data can be used to allocate sampling effort for future on-ground creel or access point surveys, contribute to the estimation of fishing effort and identify the distribution of fishing activity across a day (Smallwood et al., 2011; Veiga et al., 2010; Volstad et al., 2006).

The success of aerial surveys undertaken in the Perth Metropolitan area from April – June 2010 (Smallwood et al., 2011) led to another survey being conducted in the summer months, from December 2010 – February 2011. This survey encompassed the entire coastline between Lancelin – Bunbury (Figure 1). The specific objectives of this project were to;

1. determine the spatial distribution and density of shore-based fishers during summer,
2. explore the temporal distribution of shore-based fishers across three time of day strata (morning, midday and afternoon) and,
3. compare fisher counts and spatial distribution from the summer survey with flights conducted from April – June 2010.

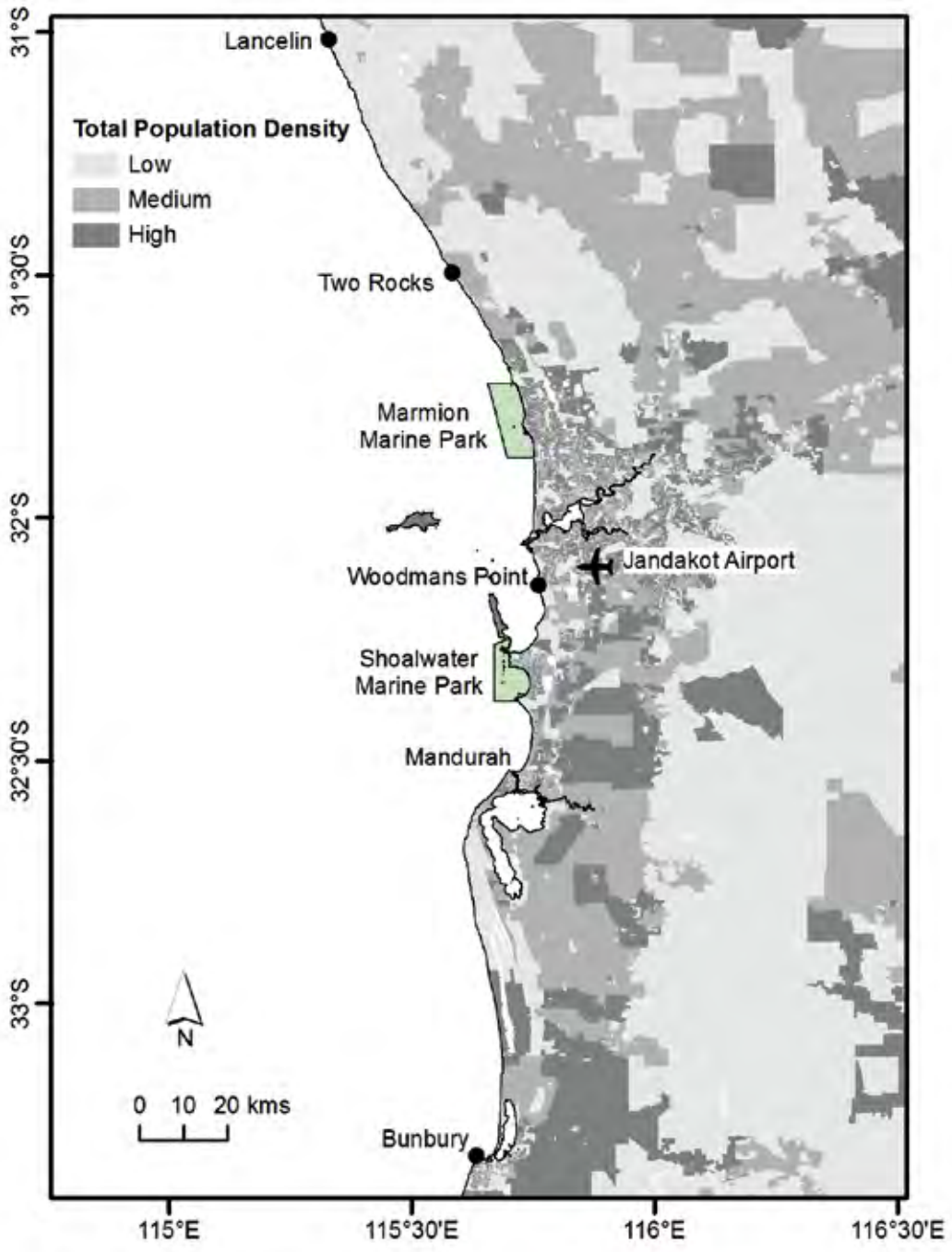

Figure 1. Extent of aerial surveys, from Lancelin to Bunbury, conducted from December 2010 – February 2011, with total population density (Source: ABS, 2006).

3.0 Methods

Aerial surveys were undertaken on 12-days per month from December 2010 – February 2011 by a single observer in a Cessna 172 fixed (high) wing aircraft. The design was based on that implemented in Smallwood et al. (2011), including randomisation of start location and direction of travel. An equal number of weekdays and weekends/public holidays were sampled and they were randomly selected in each of the surveyed months (Appendix 1). However, the study area in the second study was expanded to 300 km of coastline, which encompassed the entire shoreline from Lancelin in the north to Bunbury in the south, and was divided into 97 survey locations (Appendix 2; Figure 1).

Mean flight time was 3.5-hrs (SE±0.1, range=2.6 – 5.1 hrs) and three time-of-day strata were incorporated into the survey design; morning (7 am – 10.30 am), midday (10.30 – 2 pm) and afternoon (3 pm – 6.30 pm). Greater availability of daylight hours during summer allowed the length of the fishing day to be increased, when compared to pilot study. Although the timeframe of the original pilot study actually encompassed autumn (April- May) and winter (June) months, it will herein be referred to as the autumn study due to the majority of the fieldwork being conducted in this season.

Similar to the autumn survey, the geo-referenced location of all people actively shore-based fishing along the flight path was obtained during each aerial survey. People actively shore-based fishing were defined as those with rods or handlines in the water at the time of observation or, who were re-baiting or handling a caught fish. Any non-fishers associated with a fishing party were excluded. Digital photographs were taken throughout the flight so that the identification of non-fishers, or counts of shore-based fishers in congested areas, could be determined or checked during post-processing. Data were processed using Aerial Survey Assistant (OVER, 2010) which identified the geo-referenced location of shore-based fishers to a specific survey location, and created a shapefile that was then imported into ArcGIS 10 for further analysis. In congested areas it was not possible to discriminate between fishing parties, therefore analysis of these aerial data was based on individual shore-based fishers, rather than the fishing party.

4.0 Results

A total of 7,028 shore-based fishers were observed in the greater Perth Metropolitan area during the 36 aerial flights conducted from December 2010 – February 2011. Duplicate counts conducted on the 'return' flight between the survey northern and southern extents recorded 6,888 shore-based fishers. Unless indicated, duplicate counts of recreational shore-based fishers were excluded from the remainder of analysis. The highest number of shore-based fishers counted on a flight was 541 (afternoon/weekend flight in February), whilst the lowest number was 35 (afternoon/weekday flight, also in February).

4.1 Temporal distribution

The mean number of shore-based fishers was not significantly different between each month of the survey ($F_{(2,33)}$=3.28, ρ>0.05), therefore data were pooled across the entire study period for subsequent analysis. Aerial flights on weekdays had lower mean numbers of shore-based fishers when compared to weekends/public holidays whilst midday flights on both day types had lower mean number of fishers when compared to mornings and afternoons (Figure 2).

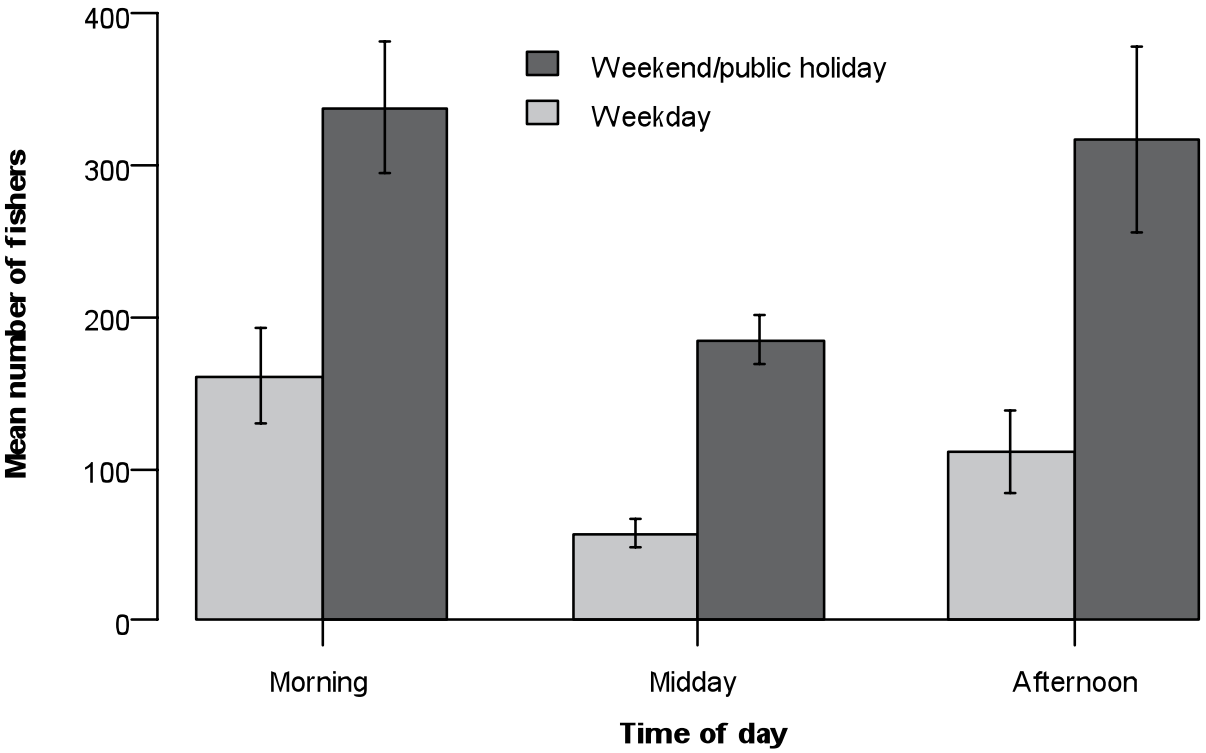

Figure 2. Mean number (±SE) of shore-based fishers recorded on each time of day and day type strata during summer between Lancelin - Bunbury.

4.2 Spatial distribution

The spatial distribution of recreational shore-based fishers varied along the coastline between Lancelin and Bunbury. On weekday flights, the highest mean counts of fishers were obtained at beaches to the south of Mandurah (i.e. Preston Beach), as well as the Ammo Jetty and beaches to the north of Two Rocks Marina (Figure 3). These same areas also had the highest mean counts of fishers on weekends/public holidays (Figure 4). In addition, Fremantle North Mole had a high mean count of fishers during the afternoon flights on weekends/public holidays. The spatial distribution of shore-based fishers was greater on weekends/public holidays, with activity observed in 8 - 14% more survey locations when compared to weekdays. Such differences were most evident between Mindarie Keys and Fremantle.

Standard errors were calculated for each time of day strata on weekdays (Figure 5) and weekends/public holidays (Figure 6). Greatest variability was generally obtained at survey locations with the highest mean numbers of shore-based fishers.

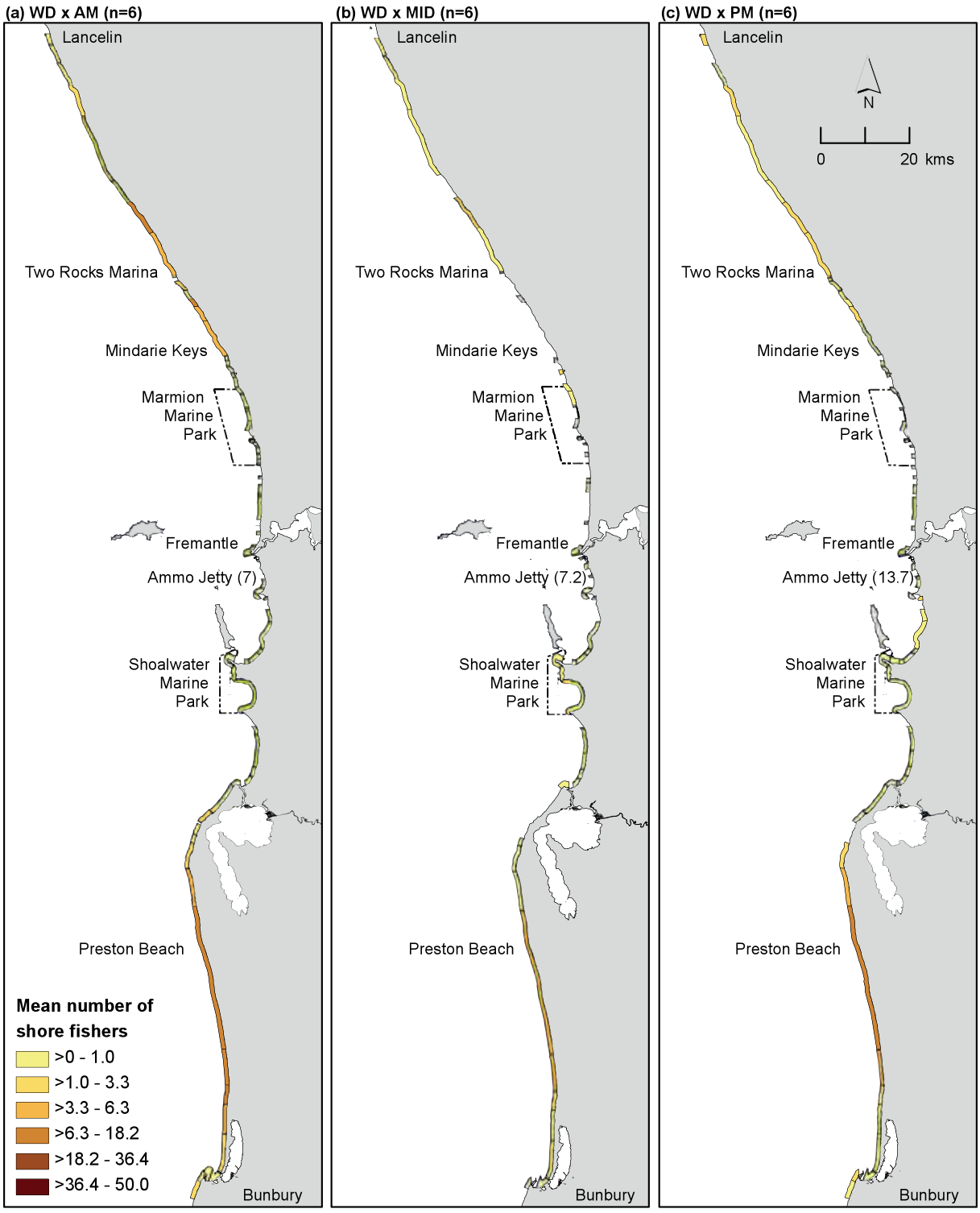

Figure 3. Mean number of shore-based fishers counted per survey location in summer on weekdays (WD) for each time of day strata (AM - morning, MID - midday, PM - afternoon) (where n = number of flights).

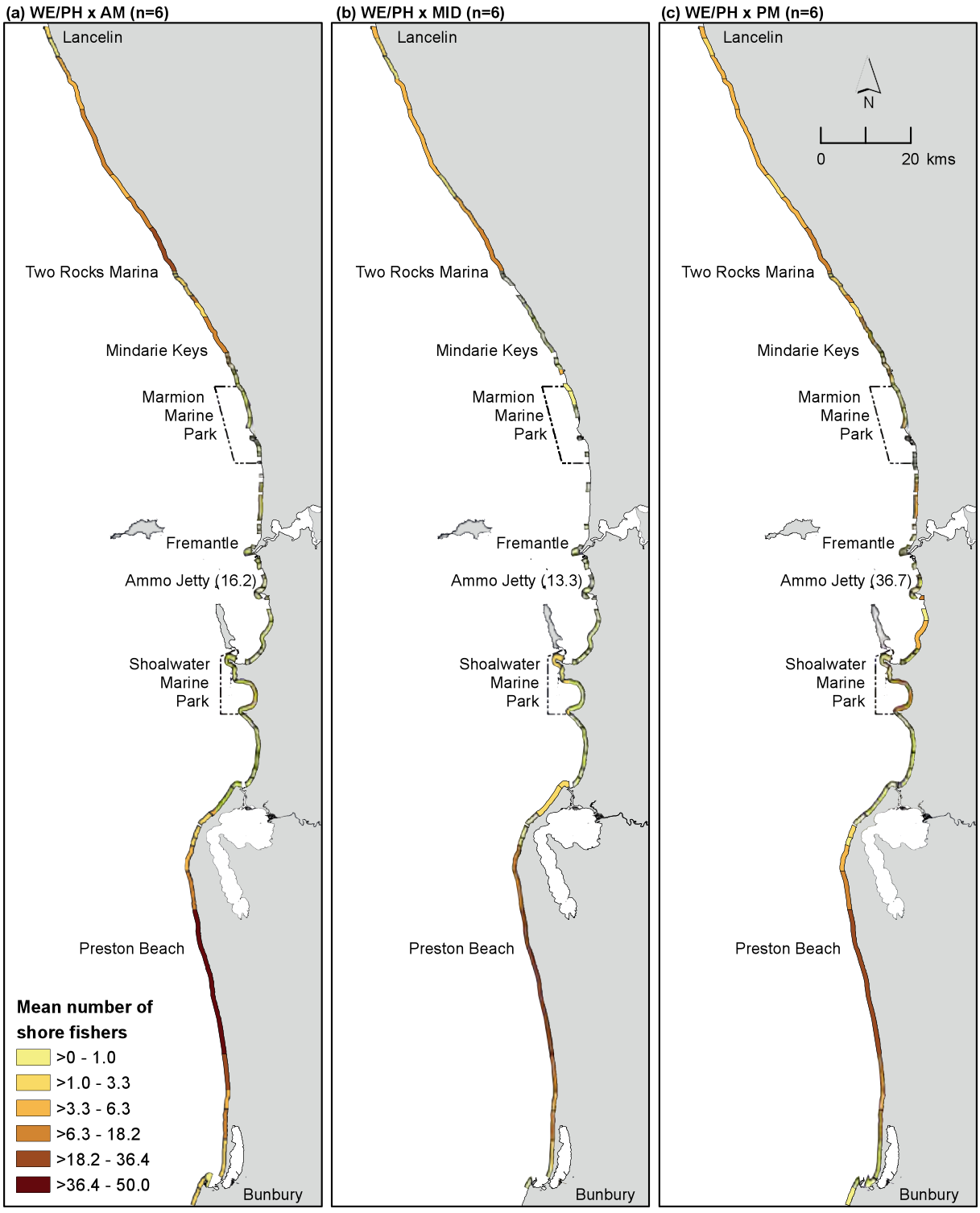

Figure 4. Mean number of shore-based fishers counted per survey location in summer on weekends and public holidays (WE/PH) for each time of day strata (AM - morning, MID - midday, PM - afternoon) (where n = number of flights).

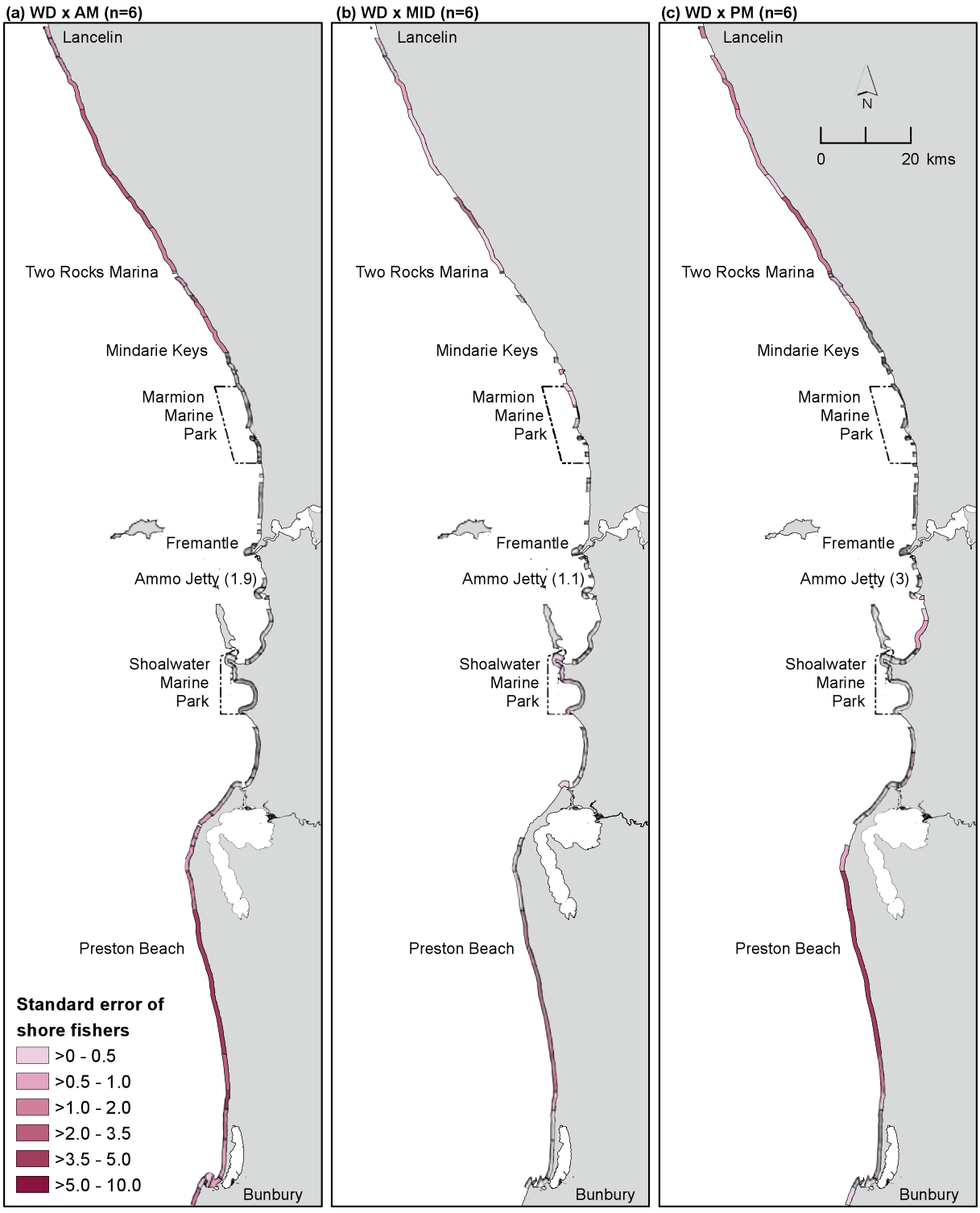

Figure 5. Standard error of the mean number of shore-based fishers counted per survey location in summer on weekdays (WD) for each time of day strata (AM - morning, MID - midday, PM - afternoon) (where n = number of flights).

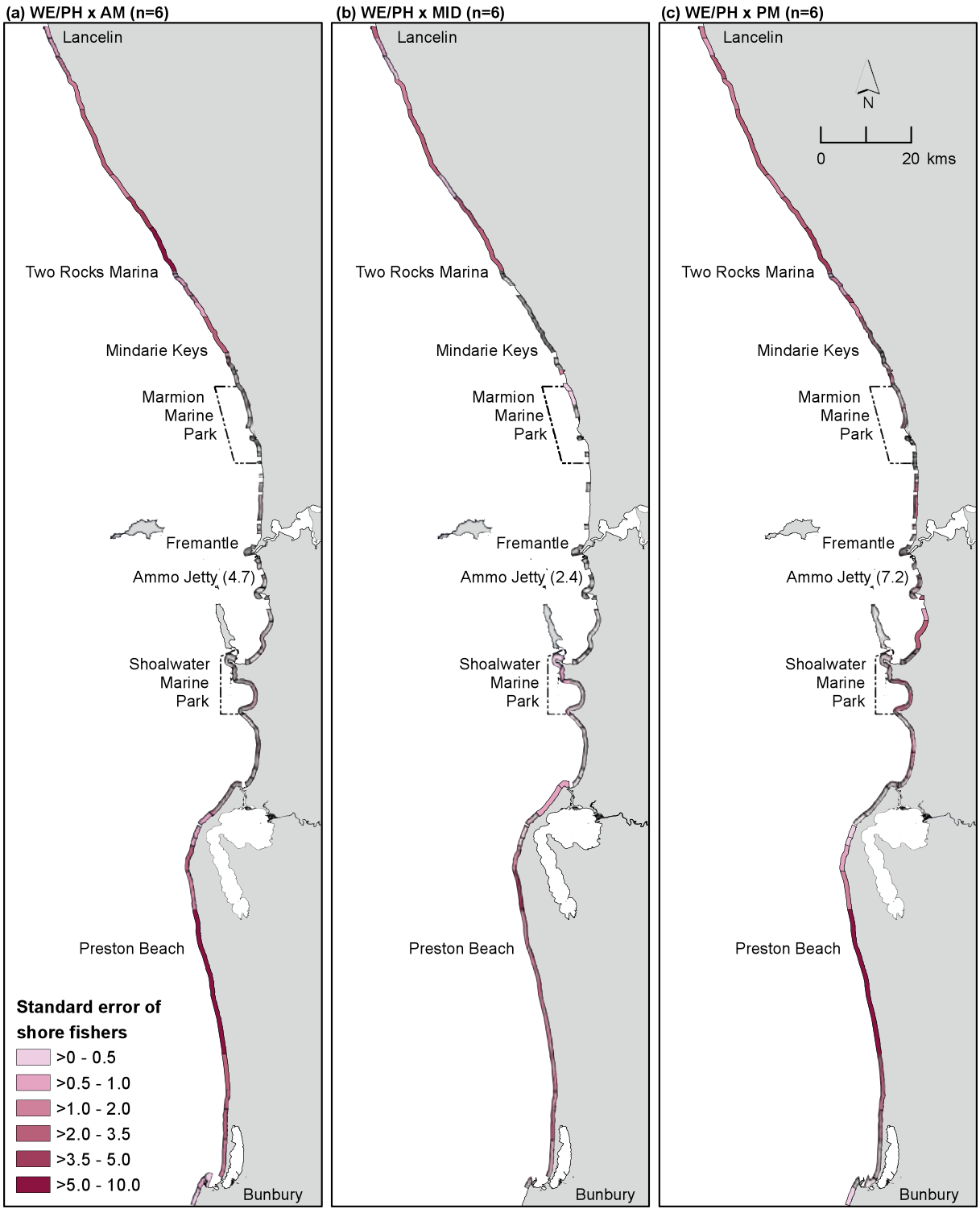

Figure 6. Standard error of the mean number of shore-based fishers counted per survey location in summer on weekends/public holidays (WE/PH) for each time of day strata (AM - morning, MID - midday, PM - afternoon) (where n = number of flights).

The shoreline length of each survey location was measured in ArcGIS using geo-referenced information on their northern and southern boundaries (Appendix 2), as well as the mean high water mark (obtained from a Landgate shapefile of hydrographical data). From this analysis, the mean length of survey locations was determined to be 4.7 km (SE±1.2 km). Although Preston Beach had the highest mean count of fishers for most day type and time of day strata, it was also the longest survey location in the study area (32.6 km) (Appendix 2). Therefore, data were standardised by the length of each survey location to provide information as mean number (or density) of shore-based fishers per kilometre.

When standardised by beach length, the Ammo Jetty had the highest mean counts of fishers per kilometre for all times of day on weekdays (Figure 7). Hillarys North Wall, Mindarie Keys and Cottesloe Groyne also had high standardised mean counts on this day type. These same locations had the highest mean counts of fishers per kilometre on weekends/public holidays (Figure 8). The standard error of the standardised mean number of shore-based fishers per kilometre for weekdays and weekends/public holidays is the same as that shown in Figure 5 and Figure 6, respectively.

No shore-based fishers were counted for the entire summer survey period at five survey locations; Hillarys Beach, Port Beach – North, Bathers Beach, Woodmans Beach – South and Jervoise Bay Boat Harbour. There were five additional beaches at which no shore-based fishers were counted on weekdays; South Trigg Beach, North Cottesloe Beach, Leighton Beach, FSC Marina and Secret Harbour Beach – North. A further seven beaches had no shore-based fishers counted on weekends/public holidays; Scarborough Beach, City Beach, Cottesloe Beach, Port Beach – South, RPYC Annex, South Beach – South and Mangles Bay. The northern and southern boundaries of these survey locations are provided in Appendix 2.

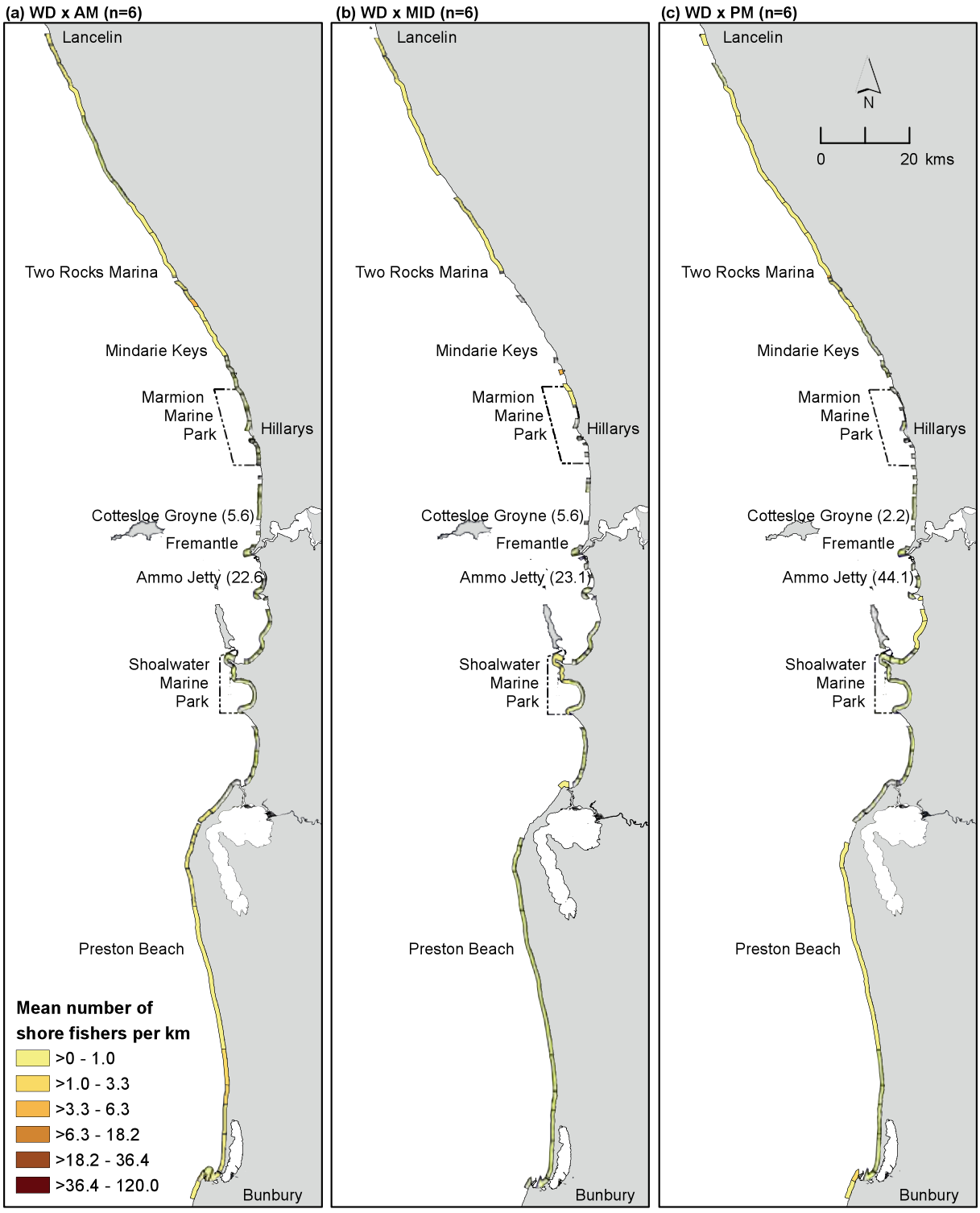

Figure 7. Density of shore-based fisher observed in summer on weekdays (WD) for each time of day strata (AM - morning, MID - midday, PM - afternoon) (where n = number of flights).

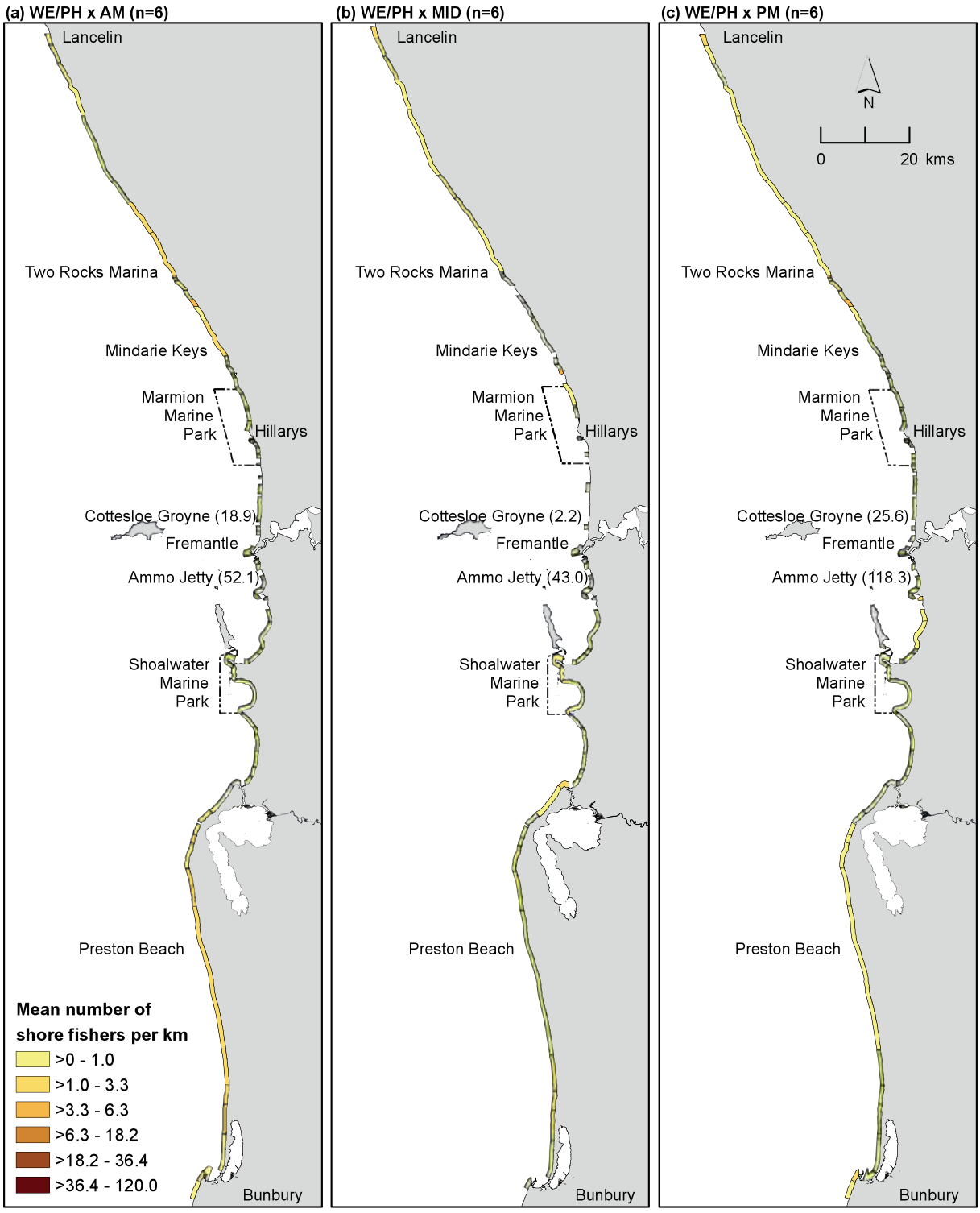

Figure 8. Density of shore-based fisher observed in summer on weekends/public holidays (WE/PH) for each time of day strata (AM - morning, MID - midday, PM - afternoon) (where n = number of flights).

A total of 613 recreational shore-based fishers were recorded within the Marmion Marine Park during the 36 aerial flights while 188 were observed in Shoalwater Islands Marine Park. Similar to the trend identified throughout the entire study area, more shore-based fishers were observed at these locations on weekends/public holidays, especially on morning and afternoon flights (Figure 9).

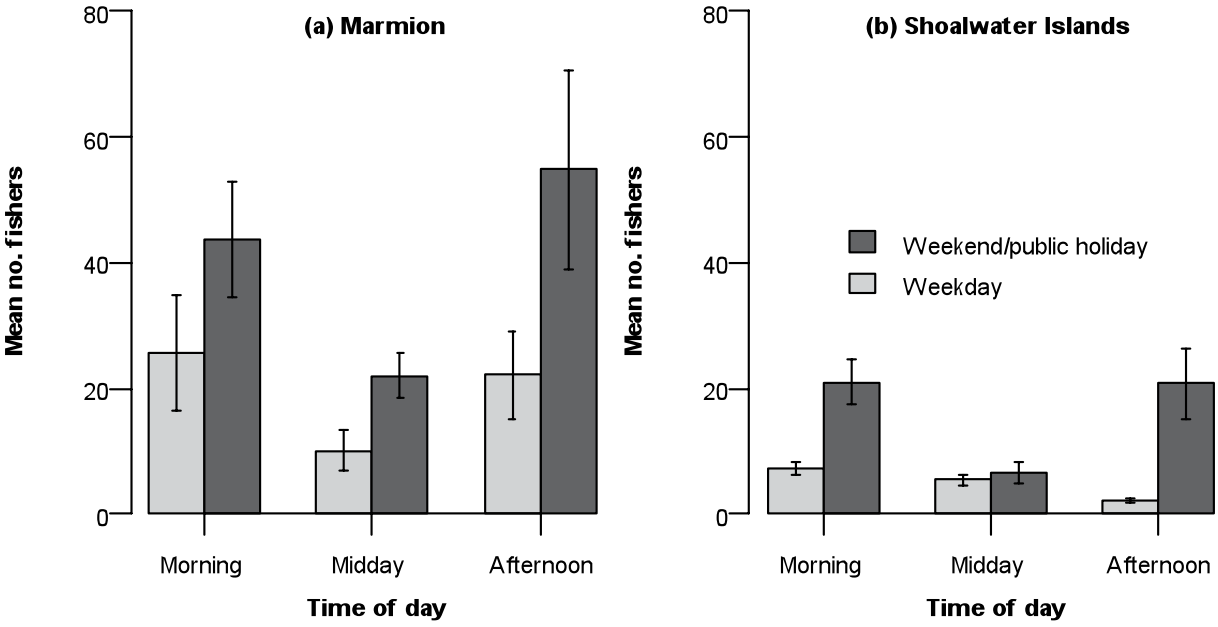

Figure 9. Mean number (±SE) of shore-based fishers by time of day and day type recorded in (a) Marmion Marine Park and (b) Shoalwater Islands Marine Park during summer.

4.3 *Seasonal comparison*

The spatial distribution and counts of recreational shore-based fishers was compared between the autumn and summer surveys. However, due to differences in time-of-day strata and survey extent, this comparison is limited to morning and afternoon aerial flights between Two Rocks Marina – Woodmans Point Groyne (Figure 10). This analysis was conducted for each for each day type (weekday, weekend/public holiday) and time of day (morning, afternoon) strata by calculating the differences in mean number of shore-based fishers for each survey period. Positive values indicate that the mean number of fishers was higher in autumn than summer, while negative values indicate the reverse.

The relative difference in mean number of shore-based fishers between surveys varied along the coastline (Figure 10). Survey locations to the north of Hillarys generally had more shore fishers in summer, especially Jindalee Beach (North) and Whitfords Beach. Conversely, survey locations further to the south had more fishers in autumn, especially at Fremantle and Woodmans Point Beach. Interestingly, the survey locations at which autumn counts were higher could have twice the magnitude of difference (12.4) when compared to the locations where summer counts where higher (5.6).

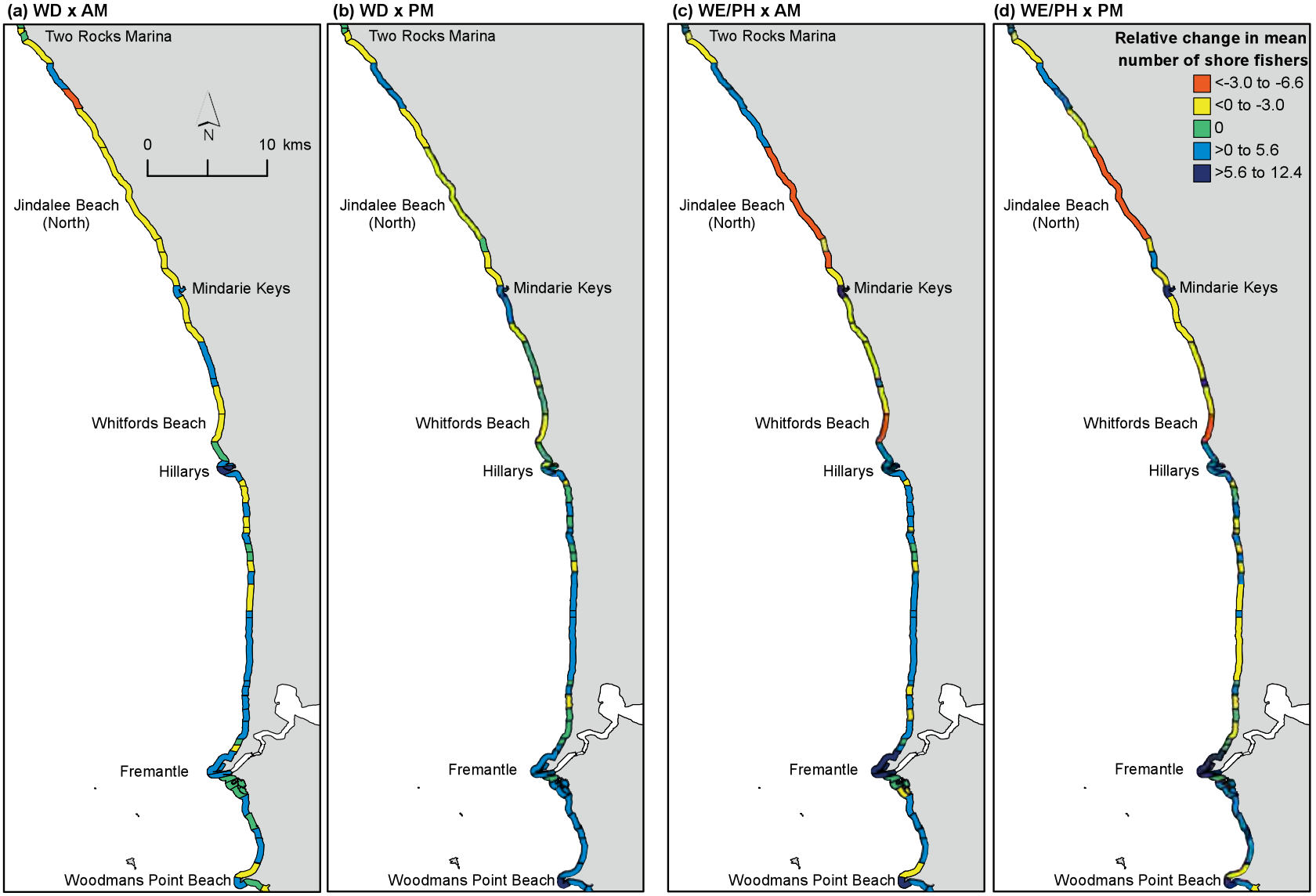

Figure 10. Relative difference in the mean number of shore-based fishers during the autumn and summer aerial surveys. Note: Positive values indicate mean number of fishers was higher in autumn than summer, while negative values indicate the reverse.

5.0 Discussion and conclusions

The 36 summer surveys were flown at three different time periods (morning, midday and afternoon), with more shore-based fishers observed during morning and afternoon flights. Flights during the autumn study were only conducted in the morning and afternoon, as anecdotal evidence suggested these time periods coincided with peaks in shore-based fishing activity (Smallwood et al., 2011). The addition of midday flights to the summer survey supports this assumption, with lower counts of fishers during this time of day on both day types.

The spatial distribution of shore-based fishers also varied along the coast and, although large groynes and jetties located within the central section of the study had high counts (i.e. Ammo Jetty, Fremantle North Mole), beaches located at the northern and southern extents were also popular. Such information is useful for planning sampling effort for future on-ground surveys. However, to assist with the differences in lengths of each survey location, platform type (i.e. beach, large groyne or jetty) should be considered as, although some beaches recorded high counts of fishers, they were often more widely dispersed when compared to groynes due to their greater length.

A direct comparison of fisher counts could not be made between the autumn and summer surveys due to slight differences in survey design. However, for many survey locations the mean number of shore-based fishers was higher in autumn than summer. This may be due to several factors including the strong, onshore breezes which prevail in summer, when compared to the lighter wind conditions often experienced in autumn. Autumn also corresponds to the peak time of year for catching Australian herring (*Arripis georgianus*) along the coast of the West Coast bioregion (Ayvazian et al., 2004), and this may attract greater numbers of shore-based fishers. Such patterns differs from many other recreational activities undertaken on the beach in the Perth Metropolitan area, where summer is known to be the period of peak use, and has been the focus of previous surveys (Blackweir and Beckley, 2004; Houghton et al., 2003). It is therefore important that surveys of shore-based recreational fishing to be undertaken across all seasons to accurately identify participation and spatial distribution. Roving creel surveys of shore-based fishing were not completed over summer, so estimates of catch were not made for this period.

The aerial survey technique was successful in collecting data along the 300km coastline during summer, whereas the autumn study only encompassed 100 km (Smallwood et al., 2011). The extended survey area resulted in the mean duration of each flight being doubled to 3.5-hrs. Travel time to/from a randomly selected start location also increased. Without removing randomisation of start location from the survey design, this length of coastline is the maximum that can be surveyed in a single flight due to the fuel capacity of the plane as well as surveyor fatigue.

Visibility biases associated with aerial surveys were discussed in the pilot study (Smallwood et al., 2011), and the same techniques were applied in the summer surveys to reduce these effects. Such techniques included the scheduling of aerial flights when the sun did not blind the observer, the use of digital cameras and good communication with the pilot to ensure the wing did not obscure fishers when turning. However, the extended survey area did pass by a military base on Garden Island, whose restricted airspace encompassed the survey location of Point Peron, in the Shoalwater Islands Marine Park. Although only active on a few aerial surveys, such a restriction did hinder the ability of the observer to identify shore-based recreational fishers in this area.

Aerial surveys provide useful information on the spatial distribution of recreational shore-based fishers which has several benefits for managing nearshore fish stocks, including planning of compliance or education activities. This is particularly pertinent adjacent to the Perth Metropolitan area, which has a large population and high levels of participation in recreational fishing. Similar management benefits could also be obtained in regional areas which are less populated, but are also used frequently by recreational shore-based fishers. The cost effectiveness of aerial surveys identified in the first study (Smallwood et al., 2011) has also been further supported here, especially along isolated parts of the coastline which are difficult to access by vehicle.

6.0 Acknowledgements

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7.0 References

Ayvazian, S., Bastow, T. P., Edmonds, J. S., How, J., Nowara, G. B., 2004. Stock structure of Australian herring (*Arripis georgiana*) in southwestern Australia. Fisheries Research 67, 39-53.

Blackweir, D. G., Beckley, L. E., 2004. Beach usage patterns along the Perth Metropolitan coastline during shark surveillance in summer 2003/04. Report for Western Australian Department for Planning and Infrastructure. Perth. pp. 122.

Houghton, D. S., Eliot, I. G., Eliot, M. J., 2003. Use of beaches on the Perth Metropolitan coast between Rockingham and Ocean Reef: with special references to Perth and Leighton Beaches. Minstry for Planning and Infrastructure Perth, Western Australia. pp. 61.

OVER, 2010. Aerial Survey Assistant. Ocean Vision Environmental Research. Perth, Western Australia.

Pollock, K. H., Jones, C. M., Brown, T. L., 1994. Angler survey methods and their applications in fisheries management. American Fisheries Society, Maryland, USA.

Smallwood, C. B., Pollock, K. H., Wise, B. S., Hall, N. G., Gaughan, D. J., 2011. Quantifying recreational fishing catch and effort: a pilot study of shore-based fishers in the Perth Metropolitan area. Western Australian Department of Fisheries. Perth, Western Australia. Fisheries Research Report No. 216. pp. 60.

Veiga, P., Ribeiro, J., Goncalves, J. M. S., Erzini, K., 2010. Quantifying recreational shore angling catch and harvest in southern Portugal (north-east Atlantic Ocean): implications for conservation and integrated fisheries management. Journal of Fish Biology 76, 2216-2237.

Volstad, J. H., Pollock, K. H., Richkus, W. A., 2006. Comparing and combining effort and catch estimates from aerial-access designs as applied to a large-scale angler survey in the Delaware River. North American Journal of Fisheries Management 26, 727-741.

8.0 Appendices

Appendix 1 Sampling schedule for aerial surveys of shore-based recreational fishing from December 2010 – February 2011

December		January		February	
1		1		1	
2		2		2	
3		3		3	
4		4		4	
5		5	No aerial flight	5	
6		6		6	
7		7		7	
8		8		8	
9		9		9	
10		10		10	
11		11		11	
12		12		12	
13		13		13	
14		14		14	
15		15		15	
16		16		16	
17		17		17	
18		18		18	
19		19	Re-schedule (from 5/1)	19	
20		20		20	
21		21		21	
22		22		22	
23		23		23	
24		24		24	
25		25		25	
26		26		26	
27		27		27	
28		28		28	
29		29			
30		30			
31		31			

Legend

- Weekend/public holiday
- Morning flight (AM)
- Midday flight (MID)
- Afternoon flight (PM)

Appendix 2 Name and boundaries (N-north, S-south) for all survey locations between Lancelin – Bunbury. Note: LG=Large groynes, SG=small groynes, B=beach, J=Jetty

Location Name	Fishing platform	Boundaries	Latitude	Longitude	Length (km)
Lancelin Town Beach	B	N - Lancelin Island Point	-31.0053	115.3232	2.5
		S - Edwards Island Point	-31.0275	115.3263	
Lancelin South Beach	B	N - Edwards Island Point	-31.0275	115.3263	4.3
		S - Lancelin South Beach Rocks	-31.0635	115.3472	
Ledge Point Beach - North	B	N - Lancelin South Beach Rocks	-31.0635	115.3472	5.8
		S - Ledge Point Rocks	-31.11	115.3707	
Ledge Point Beach - South	B	N - Ledge Point Rocks	-31.11	115.3707	7.3
		S - South of Ledge Point Rocks	-31.1699	115.3973	
Seabird Beach	B	N - South of Ledge Point Rocks	-31.1699	115.3973	15.5
		S - Villalta Wreck	-31.2981	115.4566	
Guilderton North Beach	B	N - Villalta Wreck	-31.2981	115.4566	6.0
		S - Guilderton Vehicle Access	-31.3431	115.4908	
Guilderton South Beach	B	N - Guilderton Vehicle Access	-31.3431	115.4908	8.1
		S - Blowout	-31.4027	115.5365	
Wilbinga Beach	B	N - Blowout	-31.4027	115.5365	10.8
		S - Base of Two Rocks Marina (North)	-31.4927	115.5824	
Two Rocks Marina	LG	Entire Marina			0.9
Two Rocks Beach - North	B	N - Base of Two Rocks Marina	-31.4970	115.5820	0.8
		S - Wreck Point	-31.5032	115.5841	
Two Rocks Beach - South	B	N - Wreck Point	-31.5032	115.5841	2.7
		S - The Spot	-31.5215	115.6040	
Yanchep Beach - North	B	N - The Spot	-31.5215	115.6040	2.6
		S - Club Capricorn Groyne	-31.5407	115.6158	
Yanchep Beach - South	B	N - Club Capricorn Groyne	-31.5407	115.6158	1.8
		S - South End of Yanchep Lagoon Platform	-31.5552	115.6261	
Eglington Beach	B	N - South End of Yanchep Lagoon Platform	-31.5552	115.6261	3.8
		S - Pipidinny Road	-31.5847	115.6457	
Jindalee Beach - North	B	N - Pipidinny Road	-31.5847	115.6457	8.5
		S - Jindalee Boulevard Carpark	-31.6517	115.6862	
Jindalee Beach - South	B	N - Jindalee Boulevard Carpark	-31.6517	115.6862	1.3
		S - Groyne North of Mary Street Carpark	-31.6637	115.6892	
Quinns Rocks - North	B	N - Groyne North of Mary Street Carpark	-31.6637	115.6892	1.4
		S - Quinns Rocks	-31.6758	115.6912	
Quinns Rocks - South	B	N - Quinns Rocks	-31.6758	115.6912	1.8
		S - Mindarie North Groyne	-31.6895	115.6997	
Mindarie Keys	LG	Entire Marina			0.9
Mindarie Beach	B	N - Base of Mindarie Keys	-31.6946	115.7027	2.4
		S - Burns Beach North Point	-31.7170	115.7084	
Burns Beach - North	B	N - Burns Beach North Point	-31.7170	115.7084	1.9
		S - Burns Beach Rocks	-31.7312	115.7191	

Location Name	Fishing platform	Boundaries	Latitude	Longitude	Length (km)
Burns Beach - South	B	N - Burns Beach Rocks	-31.7312	115.7191	3.2
		S - Ocean Reef North Wall	-31.7590	115.7285	
Ocean Reef	LG	Entire Marina			0.6
Mullaloo Beach	B	N - Base of Ocean Reef Groyne	-31.7640	115.7280	2.4
		S - Mullaloo SLSC	-31.7856	115.7338	
Whitfords Beach	B	N - Mullaloo SLSC	-31.7856	115.7338	2.4
		S - Pinnaroo Point	-31.8057	115.7279	
Hillarys Beach	B	N - Pinnaroo Point	-31.8057	115.7279	1.8
		S - Base of Hillarys North Wall	-31.8208	115.7367	
Hillarys North Wall	LG	Entire North Wall			0.5
Hillarys South Wall	LG	Entire South Wall			1.1
Sorrento Beach	B	N - Base of Hillarys South Wall	-31.8269	115.7402	0.7
		S - Third Groyne South of Hillarys	-31.8333	115.7472	
Marmion Beach	B	N - Third Groyne South of Hillarys	-31.8333	115.7472	0.8
		S - Rocky Outcrop South of MAAC	-31.8394	115.7503	
Watermans Beach	B	N - Rocky Outcrop South of MAAC	-31.8394	115.7503	1.4
		S - WA Marine Research Labs	-31.8523	115.7517	
North Beach	B	N - WA Marine Research Labs	-31.8523	115.7517	1.2
		S - Hamersley Pool	-31.8628	115.7522	
Mettams Pool	B	N - Hamersley Pool	-31.8628	115.7522	1.0
		S - Bennion Beach Carpark	-31.8710	115.7524	
Bennion Beach	B	N - Bennion Beach Carpark	-31.8710	115.7524	0.5
		S - Trigg Island Carpark	-31.8756	115.7519	
Trigg Beach	B	N - Trigg Island Carpark	-31.8756	115.7519	0.8
		S - South End of Trigg Beach Carpark	-31.8832	115.7531	
South Trigg Beach	B	N - South End of Trigg Beach Carpark	-31.8832	115.7531	0.8
		S - Scarborough Beach North End	-31.8899	115.7550	
Scarborough Beach	B	N - Scarborough Beach North End	-31.8899	115.7550	0.6
		S - Scarborough Beach South End	-31.8963	115.7554	
Brighton Beach	B	N - Scarborough Beach South End	-31.8963	115.7554	1.0
		S - Ventnor Street	-31.9042	115.7577	
Peasholm Beach	B	N - Ventnor Street	-31.9042	115.7577	1.1
		S - Hale Road	-31.9138	115.7577	
Floreat Beach	B	N - Hale Road	-31.9138	115.7577	2.2
		S - City Beach North Groyne	-31.9345	115.7545	
City Beach	B	N - City Beach North Groyne	-31.9345	115.7545	0.6
		S - City Beach South Groyne	-31.9388	115.7539	
Swanbourne	B	N - City Beach South Groyne	-31.9388	115.7539	5.3
		S - Grant Street	-31.9866	115.7533	
North Cottesloe Beach	B	N - Grant Street	-31.9866	115.7533	0.5
		S - Eileen Street (at OBH)	-31.9908	115.7523	
Cottesloe Beach	B	N - Eileen Street (at OBH)	-31.9908	115.7523	0.8
		S - Cottesloe Groyne	-31.9973	115.7505	
Cottesloe Groyne	SG	Entire Cottesloe Groyne			0.2

Location Name	Fishing platform	Boundaries	Latitude	Longitude	Length (km)
South Cottesloe Beach	B	N - Base of Cottesloe Groyne	-31.9973	115.7505	1.1
		S - Beach Street Groyne	-32.0074	115.7513	
Mosman Beach	B	N - Beach Street Groyne	-32.0074	115.7513	1.0
		S - Curtin Avenue Carpark	-32.0170	115.7518	
Leighton Beach	B	N - Curtin Avenue Carpark	-32.0170	115.7518	1.6
		S - North End of Fuel Tanks (at point)	-32.0305	115.7473	
Port Beach - North	B	N - North End of Fuel Tanks (at point)	-32.0305	115.7473	0.6
		S - Surf Club Cafe	-32.0349	115.7456	
Port Beach - South	B	N - Surf Club Cafe	-32.0349	115.7456	0.6
		S - Base of Fremantle North Mole	-32.0406	115.7409	
Fremantle North Mole	LG	Entire Fremantle North Mole			1.3
Fremantle South Mole	LG	Entire Fremantle South Mole			0.9
Bathers Beach	B	N - Base of Fremantle South Mole	-32.0567	115.7401	0.4
		S - Base of RPYC Annex Wall	-32.0597	115.7409	
RPYC Annex	LG	Entire RPYC Annex			0.6
FSC Marina South Wall	LG	Entire FSC Marina South Wall			1.0
South Beach - North	B	N - FSC Marina South Wall	-32.0713	115.7503	1.8
		S - Catherine Point	-32.0844	115.7526	
South Beach - South	B	N - Catherine Point	-32.0844	115.7526	1.2
		S - Coogee Marina North Wall	-32.0970	115.7584	
Coogee Marina	LG	Entire Coogee Marina			0.7
Coogee Beach - North	B	N - Coogee Marina South Wall	-32.1048	115.7613	2.2
		S - Ammo Jetty	-32.1244	115.7595	
Ammo Jetty	J	Entire Ammo Jetty			0.3
Coogee Beach - South	B	N - Ammo Jetty	-32.1244	115.7595	1.9
		S - Woodmans Point Beach - Endpoint	-32.1346	115.7406	
Woodmans Point Beach	B	N - Woodmans Point Beach - Endpoint	-32.1346	115.7406	0.6
		S - Groyne at end of Woodmans Point	-32.1353	115.7468	
Woodmans Beach - South	B	N - Groyne at end of Woodmans Point	-32.1353	115.7468	1.5
		S - Base of Woodmans Point Groyne	-32.1396	115.7611	
Woodmans Point Groyne	LG	Entire Woodmans Point Groyne			0.2
Jervoise Bay Boat Harbour	LG	Entire Jervoise Bay Boat Harbour			2.1
Challenger Beach	B	N - Base of Jervoise Bay Boat Harbour	-32.1671	115.7708	2.7
		S - Alcoa Refinery Jetty	-32.1901	115.7754	
Kwinana Commercial Area	B	N - Alcoa Refinery Jetty	-32.1901	115.7754	7.1
		S - Wells Park Jetty	-32.2477	115.7559	
Kwinana Beach	B	N - Wells Park Jetty	-32.2477	115.7559	1.2
		S - Kwinana Grain Jetty	-32.2575	115.7493	
Rockingham Beach	B	N - Kwinana Grain Jetty	-32.2575	115.7493	3.0
		S - Rockingham Jetty	-32.2756	115.7268	
Palm Beach	B	N - Rockingham Jetty	-32.2756	115.7268	1.0
		S - Bell Street Boat Ramp	-32.2756	115.7162	
Mangles Bay	B	N - Bell Street Boat Ramp	-32.2756	115.7162	2.0
		S - Causeway	-32.2727	115.6981	

Location Name	Fishing platform	Boundaries	Latitude	Longitude	Length (km)
Point Peron	B	N - Causeway	-32.2727	115.6981	3.3
		S - Causeway Opposite Side	-32.2761	115.696	
Shoalwater Bay	B	N - Causeway Opposite Side	-32.2761	115.696	3.6
		S - Mersey Point	-32.3055	115.7011	
Safety Bay	B	N - Mersey Point	-32.3055	115.7011	12.3
		S - Becher Point	-32.3706	115.7163	
Secret Harbour Beach - North	B	N - Becher Point	-32.3706	115.7163	3.8
		S - Siracusa Court Carpark	-32.4039	115.7443	
Secret Harbour Beach - South	B	N - Siracusa Court Carpark	-32.4039	115.7443	1.7
		S - Turtles Bend	-32.4167	115.7477	
Golden Bay Beach	B	N - Turtles Bend	-32.4167	115.7477	3.8
		S - Bright Reefs Road	-32.4513	115.7494	
Madora Bay Beach	B	N - Bright Reefs Road	-32.4513	115.7494	3.8
		S - Eros Place Groyne	-32.4858	115.7436	
Watersun Beach	B	N - Eros Place Groyne	-32.4858	115.7436	2.2
		S - Wade Street Groyne	-32.5051	115.736	
Silver Sands	B	N - Wade Street Groyne	-32.5051	115.736	2.7
		S - Base of Boat Harbour	-32.5205	115.718	
Boat Harbour	LG	N - Base of Boat Harbour	-32.5205	115.718	0.6
		S - Mandurah Channel North Side	-32.5211	115.7118	
Halls Head Beach	B	N - Mandurah Channel South Side	-32.5212	115.7103	1.6
		S - Roberts Point	-32.525	115.6957	
Falcon Bay Beach	B	N - Roberts Point	-32.525	115.6957	7.7
		S - Thera Street Boat Ramp	-32.5798	115.6513	
Avalon Beach	B	N - Thera Street Boat Ramp	-32.5798	115.6513	2.8
		S - Dawesville Cut North Side	-32.6	115.6317	
Florida Bay	B	N - Dawesville Cut South Side	-32.6018	115.629	2.5
		S - Hunter Street Carpark Rocks	-32.6239	115.6226	
Melros Beach	B	N - Hunter Street Carpark Rocks	-32.6239	115.6226	1.8
		S - Yalgorup Park Rocks	-32.6405	115.6169	
Tims Thicket	B	N - Yalgorup Park Rocks	-32.6405	115.6169	5.7
		S - Whitehills Beach Road	-32.6904	115.6097	
Whitehills Beach	B	N - Whitehills Beach Road	-32.6904	115.6097	8.7
		S - Middle Lake Road	-32.7666	115.6238	
Preston Beach	B	N - Middle Lake Road	-32.7666	115.6238	32.6
		S - Lake Preston Sandbar Track	-33.0553	115.6847	
Myalup Beach	B	N - Lake Preston Sandbar Track	-33.0553	115.6847	8.0
		S - Taranto Road	-33.1269	115.6904	
Binningup Beach	B	N - Taranto Road	-33.1269	115.6904	4.3
		S - Lakewood Shores Golf Course South End	-33.1653	115.685	
Buffalo Beach	B	N - Lakewood Shores Golf Course South End	-33.1653	115.685	6.6
		S - Leschenault Estuary Beach Track	-33.2252	115.6841	
Belvedere Beach	B	N - Leschenault Estuary Beach Track	-33.2252	115.6841	8.7
		S - Leschenault Estuary Cut North Side	-33.3027	115.6714	

Location Name	Fishing platform	Boundaries	Latitude	Longitude	Length (km)
Koombana Bay	B	N - Leschenault Estuary Cut South Side	-33.3046	115.6711	3.6
		S - Small Groyne 2	-33.3184	115.6444	
Bunbury Harbour Groyne	LG	Entire Bunbury Harbour Groyne			2.5
Bunbury Beach	B	N - Base of Bunbury Harbour Groyne	-33.3096	115.6369	1.8
		S - South End of Basalt Outcrops	-33.3239	115.6299	
Back Beach - Bunbury	B	N - South End of Basalt Outcrops	-33.3239	115.6299	3.9
		S - Ocean Drive Beach Track	-33.3588	115.6177	