



Government of Western Australia
Department of Transport

Peel Region

Recreational Boating Facilities Study 2010



***Technical Report 449
April 2011***

MANDURAH INLAND WATERS

NOT TO BE USED FOR NAVIGATION

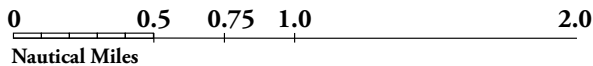
For more detailed information,
Refer to the Department of Transport's Nautical Charts
Peel Inlet and Harvey Estuary WA 848

Bouvard WA 755

Cape Peron to Dawsville WA 913



Government of Western Australia
Department of Transport



LEGEND

- 5 Knot Speed Area
- 8 Knot Speed Area
- 12 Knot Speed Area
- Boating Prohibited Area
- Water Ski Area
- Open water
- Shallow water
- Very shallow water
- Launching ramp
- Non-powered launching

Speed conversion chart

knots	km/h	mph
1	1.85	1.15
5	9.25	5.75
8	14.80	9.20
12	22.20	13.80

Radio frequencies

Call sign

Mandurah Water Rescue _____ VMR 611

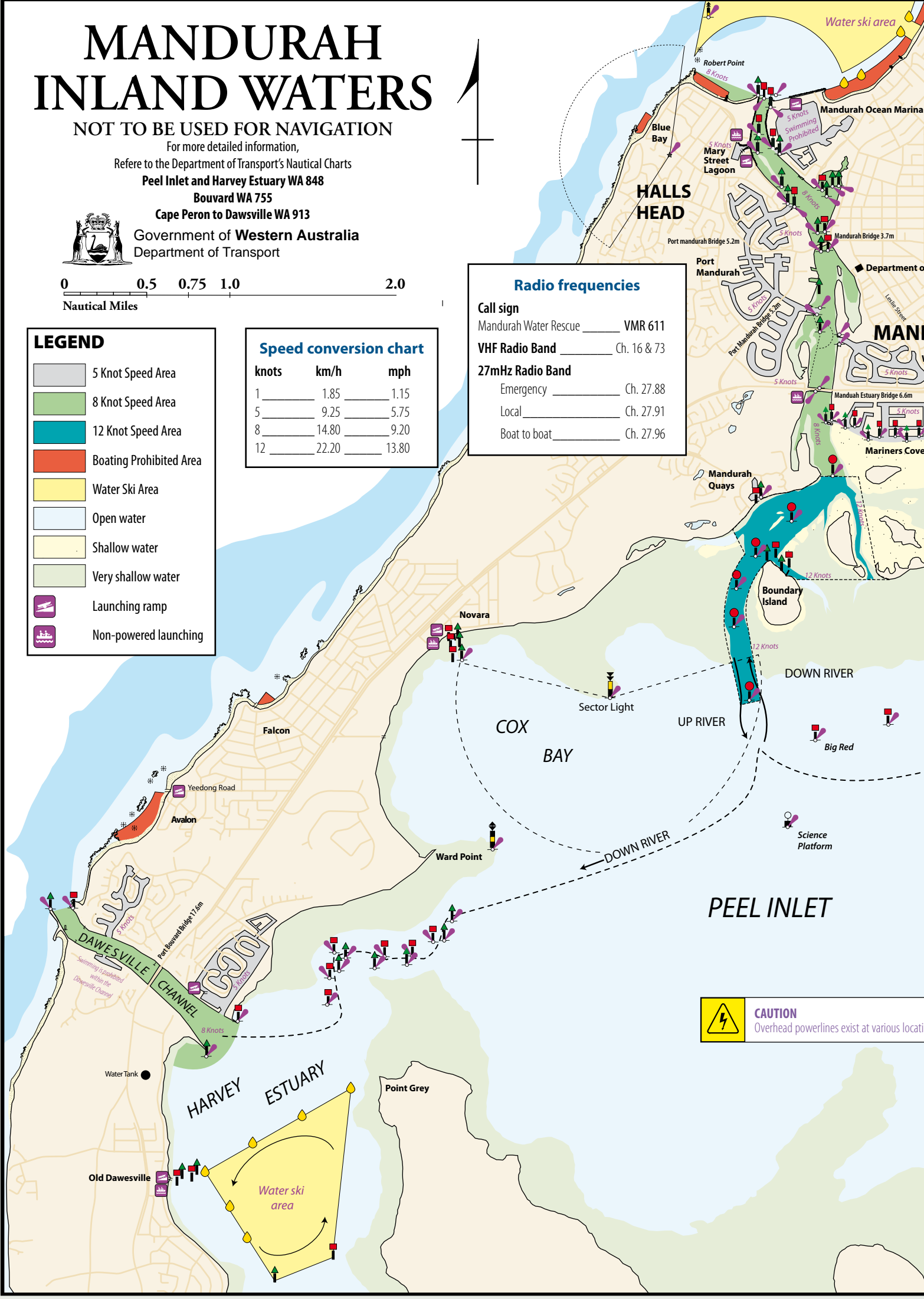
VHF Radio Band _____ Ch. 16 & 73

27MHz Radio Band

Emergency _____ Ch. 27.88

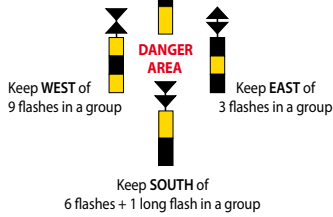
Local _____ Ch. 27.91

Boat to boat _____ Ch. 27.96



Cardinal marks

Keep NORTH of uninterrupted quick flashes



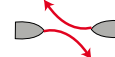
Basic rules of the waterways

Vessel Overtaking Another



Every overtaking vessel gives way (this includes sailing vessels)

Power Vessels Meeting Head On



Each vessel alters course to starboard

Power Vessels Meeting



Vessel having the other to starboard gives right of way

Power Meeting Sailing Vessel



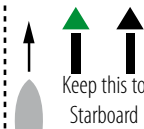
Power gives way to sail except when sailing vessel is overtaking

Heading up river

Red Flashing Light



Green Flashing Light

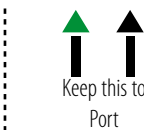


Heading down river

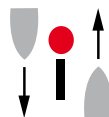
Red Flashing Light



Green Flashing Light



Safe Water / Mid Channel Marks



Safe Water Mark
(in centre of channel)
Long white flashes

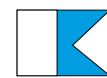
Diving flag

Any boat with divers (not snorkellers) operating from it must always display signals by day or night to inform other boat users. The daytime signal for divers is an International Code Flag "A". The flag must be at least 750mm long and 600mm wide.

Divers operating without a vessel, for example from a jetty, must display the International Code Flag "A". The flag must be at least 750mm long and 600mm wide.

The flag may be displayed from a buoy. If displayed from a buoy, the flag must not be less than 300 mm in length and 200 mm in width.

The flag must be clearly visible to all vessels operating in the vicinity.



International Code Flag "A"

Water skiing

Water skiing is when a person(s) is being towed behind a vessel at a speed of 8 knots or more. It takes at least three people to go water skiing:

1. a driver of at least 17 years of age;
2. an observer of at least 14 years of age; and
3. a skier who is being towed by the vessel.

A vessel taking-off with skiers shall give way to a vessel landing skiers.

Bridge and powerline clearances

Clearance heights shown on this guide are in metres, above highest astronomical tide (HAT).

Actual clearance will vary, depending on the tide.

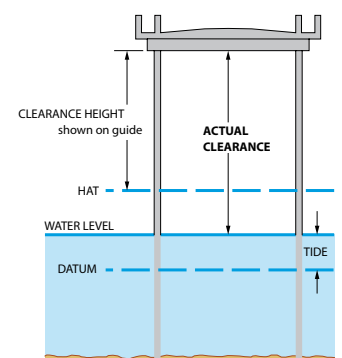
Bridge clearances

Mandurah Bridge	3.7m
Mandurah Estuary Bridge	6.6m
Port Mandurah Bridge	5.2m
Port Bouvard Bridge	17.6m
Barragup Bridge	2.8m
Ravenswood Bridge	3.1m

Powerline clearances

Barragup Powerline	5.8m
Mandurah Bridge Powerline	5.4m
Ravenswood Powerline	2.8m

The height of the tide throughout the day will vary depending on astronomical and meteorological conditions.



Executive Summary

The Peel region, comprising the waterways of the Peel Inlet, Harvey Estuary, Murray and Serpentine Rivers, Dawesville Channel, extensive canal estates and adjacent coastal waters, provides one of the most popular recreational boating environments in Western Australia. When considered along with the excellent boating destinations, fishing, crabbing and cruising opportunities it is of little surprise that the Peel region has one of the highest rates of boat ownership in WA.

The Department of Transport (DoT) has for a number of years been undertaking maritime facility audits, monitoring maritime facility development and conducting ramp surveys to understand the supply and demand for boating facilities in the Peel region. In 2008 the DoT released the *Perth Recreational Boating Facility Study* which identified that, by the end of 2006, most Perth facilities (pens, ramps and storage) were operating at capacity. With Mandurah being located close to Perth it is evident that some of the unmet Perth demand has moved to Mandurah, placing further pressure on facilities. Most pen facilities in Mandurah are already at capacity and boats ramps are heavily utilised on good boating days, weekends and school holidays. When the high number of visiting boats and the continued strong land development growth in the City of Mandurah and Shire of Murray are also considered, it is evident that there is a need to understand and plan for the future boating demands in the Peel region.

The *Peel Region Recreational Boating Facilities Study* examines the recreational boating facility requirements for the Peel region to 2031 and proposes a number of recommendations to address the forecast boating demand. The DoT released a similar report for the Peel region in 1996 which was well received, often quoted and has provided guidance to numerous facility improvements since that time.

The 2010 Study has been undertaken by the Coastal Infrastructure Business Unit within the DoT and is intended to serve as a Discussion Paper and reference document for the providers and managers of recreational boating infrastructure in the Peel region.

Once endorsed, the recommendations of this study should be pursued via the involvement of the relevant local government authorities. Some projects may qualify for funding assistance under the DoT's Recreational Boating Facilities Scheme (RBFS).

As the Peel region is an area of exceptionally high growth with a very high ratio of recreational boat ownership per head of population (101.7 per 1,000 for 2009, forecast to rise to 120.9 per 1,000 for 2031¹) the strategies proposed in this report should be reviewed regularly against growth and development in the Peel region.



¹ Australian Bureau of Statistics Estimated Resident Population figures from Census Rebasing (1996, 2001 and 2006), 1990 figures from 3311.5 (published in 1992).

Summary of Recommendations

Whilst the number of existing boat launching facilities in the Peel region is considered adequate in the short term (five years), many improvements can be made to existing facilities to improve their capacity and performance. In the longer term, further boat launching capacity will be required to accommodate the needs of the new urban growth areas.

Boat pen facilities in the Peel region remain at capacity and there is pressure to provide additional pens and some formal swing mooring areas. Some of this demand can be met in the short term by re-organisation and expansion to improve the capacity of existing marina facilities. It is noted that some of this work is already underway, as is the planning for the establishment of new marina facilities in the region including at Point Grey and adjacent to the existing Mandurah Ocean Marina. Improvements to recreational boating facilities generally, including ancillary amenities and services, can be made across the Peel region.

The Peel region's waterways have traditionally been utilised by fishermen and crabbing enthusiasts and while this is likely to continue, despite increasing fishery regulation, it should be recognised that there is an increasing number of boats that are also likely to be used for more passive activities such as cruising, day tripping and picnicking. It is perhaps in this area of demand that the biggest improvement in facilities could be made via the provision of attractive destinations, short stay facilities, information guides and services.

Recommendations	
1.	Encourage existing facilities in the Peel region to be developed to their full potential before new facility proposals are pursued at nearby locations.
2.	Support the City of Mandurah's Foreshore Focus 2020 Vision marina development proposals, subject to appropriate environmental and engineering studies being completed.
3.	Support the boating facility initiatives proposed in the Mandurah Foreshore Focus 2020 Vision report, particularly in relation to short stay and boating destination initiatives.
4.	Support the development of short stay boating facilities in Mandjar Bay subject to community support and resolution of design constraints including adequate water depth.
5.	Encourage and support the incorporation of a waterside facility at the proposed land development at Point Grey, subject to appropriate environmental and engineering studies being completed and the relevant government approvals being obtained.
6.	Incorporate a public boat launching facility in the Point Grey marina subject to appropriate environmental and engineering studies being completed and the relevant government approvals being obtained.
7.	Develop Point Grey as a boating destination with facilities to cater for short stay visitors subject to appropriate environmental and engineering studies being completed and the relevant government approvals being obtained.

8.	Investigate opportunities to utilise the site adjacent to the South Yunderup bund wall dredge spoil area and opposite Wellya Crescent for the development of a new regional boat launching facility.
9.	Support the Shire of Murray's investigation into an alternative site for the North Yunderup (Culeenup Road) boat ramp.
10.	Support the Shire of Waroona to undertake a strategic site evaluation and audit investigation into boat launching facilities.
11.	Support the planning and approval agencies in the Peel region including Local Governments, the Departments of Transport, Water, and Environment and Conservation in the finalisation of the Peel Regional Park Plan to identify appropriate recreational sites and facilities.
12.	<p>Manage the impacts of boat wash to preserve and protect the natural environment and artificial waterways in the following ways:</p> <ul style="list-style-type: none"> • Signage in canal estates and river systems; • Discourage larger boats from operating in the Serpentine River; • Implement speed restrictions; and • Review the effectiveness of the Swan River Trust's 2009 recommendations on boat wash as shown in the <i>Boating Management Strategy for the Swan Canning Riverpark</i>.
13.	Include beach landing and launching areas when appropriate, adjacent to existing formal boat launching facilities for use by non-powered craft.
14.	Extend the finger jetties, increase the level of formalised trailer parking and optimise the mooring capacity at the Mary Street Lagoon boat ramp.
15.	Extend the two finger jetties at the Novara boat ramp.
16.	Extend the finger jetties at the Dawesville boat ramp to accommodate additional berthed boats.
17.	Extend the finger jetties at the Parkridge boat ramp to accommodate three boats on each side.
18.	Construct a jetty and formalise the trailer parking at the Rivergum Esplanade boat ramp.
19.	Expand and formalise trailer parking at Batavia Quay (Warma Way), South Yunderup.
20.	Investigate berthing arrangements at Wharf Cove, Murray Lakes.
21.	Upgrade parking facilities at the Riverside Drive boat ramp.

22.	Restrict powered boat usage at the Lakes Road, Olive Road, and Leura Street (Estuary Road) boat ramps.
23.	Evaluate options to upgrade the Birchmont and Herron Point boat launching facilities.
24.	Investigate opportunities for the development of a new public boat launching facility or non-powered launch site, on the western side of the Mandurah Estuary Bridge close to the Bridgewater North development.
25.	Investigate opportunities for the development of a new boating facility development within the Regional Open Space reservation adjacent to the Harvey Estuary on the southern side of the Dawesville Channel.
26.	Support the development of boat stacking facilities in locations where they can be demonstrated to be compatible with surrounding land uses.
27.	Progress the implementation of a mooring control area for the Peel region and proceed to establish a number of managed, permanent swing mooring areas.
28.	Establish and promote additional short stay moorings and berths at key destination points.
29.	Establish short stay and overnight mooring facilities in the Murray River for use by recreational boats and houseboats, at appropriate locations. Install extra mooring facilities in the Murray River.
30.	Create a publication/s identifying short stay facilities and destination points within the Peel region to promote tourism and recreational opportunities. Such facilities would provide further boating alternatives to activities such as fishing and crabbing.
31.	Improve public awareness and the availability of sillage facilities in the Peel region.
32.	Encourage any new marina developments to provide additional on-water public fuelling and sillage facilities.
33.	Encourage the upgrade of existing boat launching facilities via the installation of related ancillary amenities and services such as universal access pontoons, improved parking and other facilities generally supported by the DoT's Recreational Boating Facilities Scheme.
34.	Upgrade and standardise directional signage at boat launching facilities in the Peel region.
35.	Encourage land developers in the Peel region to provide new or improved public boating infrastructure within their development or contribute to the provision of public facilities nearby.

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1. Introduction

The Peel region, and in particular the City of Mandurah, has one of the fastest population growth rates in Australia, averaging 4 per cent per annum over the past five years¹. This is forecast to continue at an average rate of 2.64 per cent until 2031.

The current permanent population for the Peel region is approximately 90,000 people², while each year more than one million tourists and visitors enjoy the attractions that the region has to offer. A significant number of these visitors also use the boating facilities in the Peel region.

The following figures are an annual average of tourism income for the three financial years 2004/2005, 2005/2006 and 2006/2007 and show the importance of tourism to the Peel region.²

Table 1. Value of Tourism to the Peel region per annum

Visitors	Total Spent (\$ million)
Domestic Visitors (Intrastate and Interstate)	123
International Visitors	15
Total	138

A major attraction of the Peel region is the 133 square kilometres of estuarine and river waterways. Many of these are sheltered and suitable for small craft as well as having direct access to the Indian Ocean. The Peel region also has some 50 kilometres of Indian Ocean coastline. Water based activities include a number of popular recreational boating pursuits such as fishing and crabbing (river, estuary and sea), snorkelling and scuba diving, sailing, river cruising, power boating, yachting and water-skiing.



¹Australian Bureau of Statistics Estimated Resident Population figures from Census Rebasing (1996, 2001 and 2006), 1990 figures from 3311.5 (published in 1992).

² Tourism Western Australia Development Commission Area Fact Sheet Peel 2007

2. Study Parameters

2.1 Study Area

The study area (see Map 1 in the Appendix) is defined as the City of Mandurah and the Shires of Murray and Waroona. It includes the Peel Inlet, the Harvey Estuary and the Murray, Serpentine and Harvey Rivers together with the Indian Ocean frontages of the City of Mandurah and Shire of Waroona.

2.2 Summary of Existing Facilities

Table 2 summarises the total available boat storage and launching facilities across the Peel region as compiled from the DoT's records. Boat launching sites are shown on Map 2 (located in the Appendix).

Table 2. Summary of Existing Recreational Boating Facilities

Location	Public Boat Ramp Lanes	Boat Pens	Residential Moorings	Swing Moorings (40% in permanent use)	Boat Stackers
Peel Region	45 and 3 Beach Launching Sites	776	2032	238	1 (45 stacks)
Total	48	3,091			

2.3 Recreational Boating and Facilities Defined

The term 'recreational boating' used in this study refers to the boats that navigate the waterways of the Study Area, predominately for recreational purposes, and require formal boating facilities. It does not include commercial boats such as charter boats and houseboats. Non-powered craft such as canoes, kayaks and small sailing craft are used extensively in the Peel region and make use of public launching facilities and associated infrastructure.

Non-powered recreational boating such as canoeing and rowing are becoming increasingly popular in the Peel region. In the past, national kayaking titles have been held at Ravenswood, and white water rafting is available upriver. There has also been an increase in paddling visitors to the region, which is confirmed by the popularity of the canoe guides compiled by the Canoe Trail Friends of Mandurah and Pinjarra Inc (Friends) and the annual Peel region Canoe Week. There are an estimated six canoe and kayak clubs in the Peel region with approximately 375 members.

A number of sections of the Murray and Serpentine Rivers are suited to canoeing in its various forms. The *1996 Boating Facility Study* identified the western side of the Harvey Estuary as providing the best location for a possible future rowing facility in the Peel region. Any selected site would be dependent on the availability of suitable adjacent land.

Within the new Mariner's Cove development, there is a proposal to allow the transport of recreational canoes/kayaks from the car park area to the water's edge via a ramp leading from the northern breakwater to the foreshore area¹. This will provide safe and direct access to the estuary away from the adjacent boat launching ramp area while still allowing access to the land based amenities of the boat launching facility.

Based on information provided by the Friends², any new launch site for non-powered boats should consider the following issues:

- potential sites of conflict between non-powered/powered boats (and develop a management strategy if necessary);
- the preferred option for a non-powered launch site is 'beach style' sand based;
- should be at least four metres back from the high water mark;
- have a minimum width of five metres;
- the provision of picnic tables with bench seats and shade structures on a grassed or similar area is highly recommended;
- have adequate car parking to accommodate users of the non-powered site; and
- toilets should also be established at the location.

Powered recreational boats are registered by the DoT. Boats up to 7.5 metres in length are considered trailerable and generally require boat launching ramps. Boats greater than 7.5 metres are generally considered to require on-water storage facilities.

Recreational boating facilities, for the purposes of this study, comprise boat ramps and associated infrastructure such as car and trailer parking, jetties, swing moorings, boat stackers and boat pens. In some cases it may also include small boat harbours. Jetties attached to canal blocks have been considered as they are usually permanent moorings but riverside jetties (the Murray and Serpentine Rivers) have been excluded as they are relatively low in number and are frequently used as short term and holiday moorings.

2.4 Planning Horizon

A planning horizon to 2031 has been selected. This approaches the limit of population predictions based on the WA Planning Commission's data, census data and recreational boat growth predictions based on historic boat registration data held by the DoT.

2.5 Boating Facility Site Selection Issues

The selection of a site for maritime facility development is influenced by a number of factors including shelter, safety, navigation and the existing use of adjacent land and water areas. These factors differ from solely land based development in that site selection is critical, noting that ideal sites on the Peel Inlet / Harvey Estuary and coastline are rare. Engineering costs to develop and maintain maritime facilities in less than ideal locations can be extremely high.

Favourable sites for new facility development must also be selected with regard to the broader town planning considerations. Town planning schemes and policies seek to define future growth areas and include the establishment of development nodes, transport corridors and high activity areas.

¹ Foreshore Management Plan – Mariner's Cove Development – Stage 6CA, RPS Environment and Planning, June 2009

² Barry Small, President of the Canoe Trail Friends of Mandurah and Pinjarra Inc

It is an accepted principle that the first priority in new facility development is to realise the potential of existing facilities. Suitable sites for new maritime facilities are limited, costly to develop, and subject to extensive and often lengthy approval processes.

Given the growing level of boat ownership in this popular boating region, local communities adjacent to the extensive waterways (coast, estuaries and rivers) will have an expectation that public boating facilities will be available as part of the range of community infrastructure provided. However, the site identification and development of new boating facilities in any location can be problematic and there are many issues to be considered.

Some factors which affect the potential of both coastal and estuarine sites to be developed as boating facilities include:

- the ability to utilise or establish sheltered water in a manner that delivers the best mix of low maintenance structures with environmental and social acceptability;
- safe access to sheltered water areas and on the coast, a safe route to the open sea;
- availability of adequate water depths (including freedom from hidden hazards);
- a balance between shallow water requiring dredging and deep water with expensive construction costs;
- sufficient space for the proposed development with allowance for future expansion on both land and water;
- the proximity to desirable boating activity destinations;
- the proximity to centres of present and future population, or in other words, close to areas of demand;
- good road access for vehicles towing trailer boats and services;
- compatibility of adjacent land uses;
- environmental and social acceptability of the proposed development;
- statutory requirements under the Native Title Act 1993 (Cth) and the Aboriginal Heritage Act 1972 (WA); and
- consideration needs to be given of projected sea level rises.

In the Peel region there are currently three beach launching sites that only partially address these factors. This section of coastline faces directly onto the open ocean and is subject to long-shore littoral sand drift (the ocean entrance is kept open by expensive sand bypassing operations at both Mandurah and Dawesville). Fortunately there are two access points, Eastport Marina and Mandurah Ocean Marina that are near to the open sea.

In considering potential sites for facility development in the Peel Estuary, the threshold capacity of the waterway is a frequently raised issue. Threshold capacity in this context refers to the maximum number of craft that should be in operation on the waterway. To date no determination of the threshold capacity has been undertaken by Government agencies. Similarly, a threshold capacity has yet to be determined for the Swan and Canning Rivers.

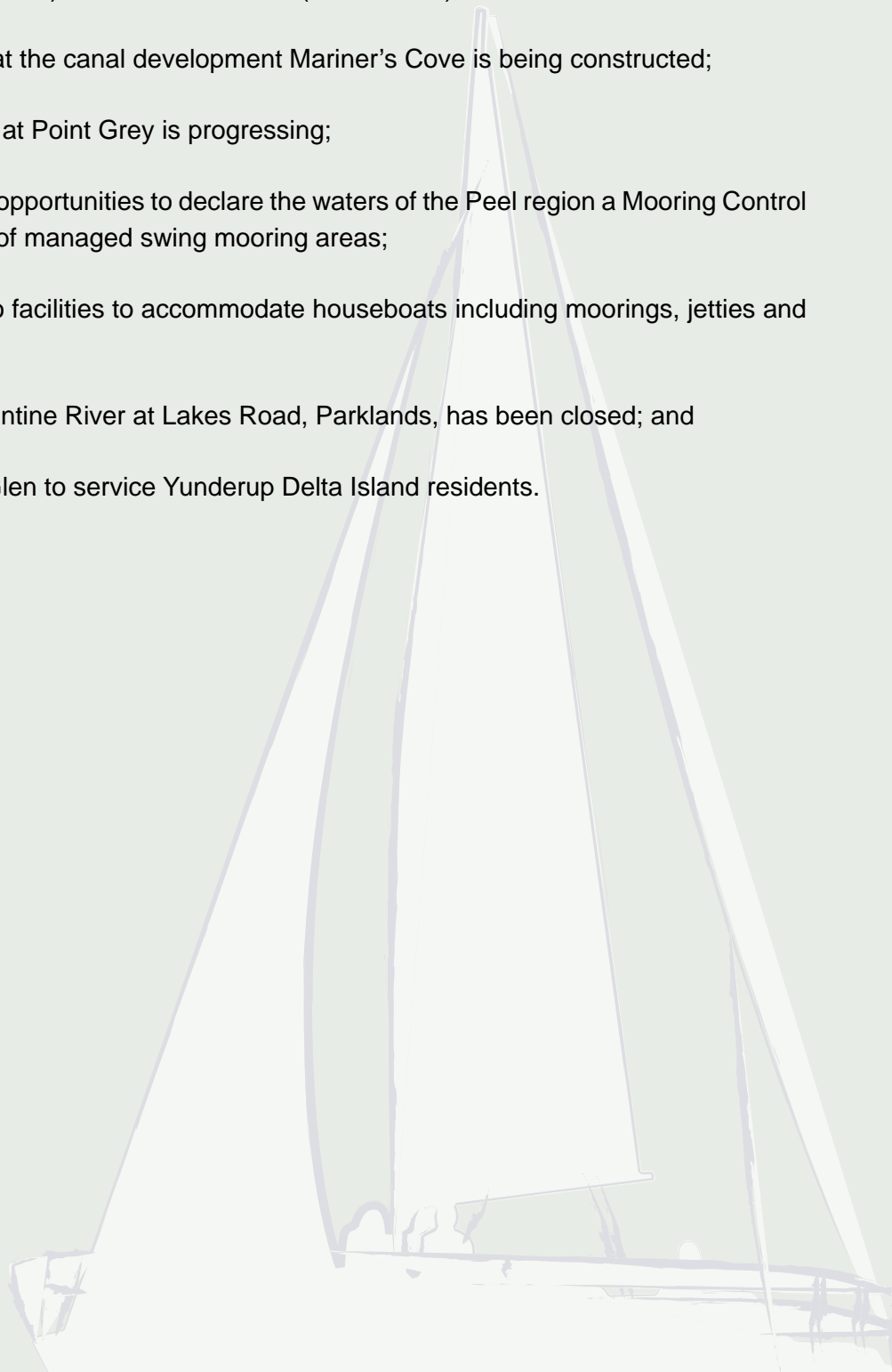
The number of estuary users can vary quite markedly in respect to seasons and days of the week. Peak boating activity usually occurs during weekends, particularly in spring, summer and autumn months, while at other times there can be few users. These variations in usage patterns can result in launching facilities experiencing congested conditions one day and being virtually empty the next.

3. 1996 Boating Facilities Study for the Peel Region

The previous boating facility study for the Peel region was released in 1996. The *Boating Facilities Study for the Peel Region* made recommendations for each facility in the region. Since the release of the 1996 study, many of the recommendations proposed in the study have been acted on and completed. They have been undertaken by State and local governments, many with funding support from the DoT's Recreational Boating Facilities Scheme. See Appendix 1 for a list of the 1996 recommendations and current outcomes.

Successful outcomes of the previous study include:

- Boat launching facilities have been upgraded at Birchley Road (Coodanup), Waterside Drive (Dudley Park), Estuary Road (Parkridge), Wharf Road (Murray Lakes), River Road (South Yunderup), Culeenup Road (North Yunderup), Bertram Road (Coodanup), Novara (Falcon), Mary Street (Halls Head), Batavia Quay / Warma Way (Yunderup Canals) and Riverside Drive (Furnissdale);
- A new local boat launching ramp at the canal development Mariner's Cove is being constructed;
- Planning for new boating facilities at Point Grey is progressing;
- The DoT is currently investigating opportunities to declare the waters of the Peel region a Mooring Control Area, enabling the establishment of managed swing mooring areas;
- Improvements have been made to facilities to accommodate houseboats including moorings, jetties and sullage;
- The public boat ramp in the Serpentine River at Lakes Road, Parklands, has been closed; and
- A new local public jetty at Strain Glen to service Yunderup Delta Island residents.



4. Facility Demand in the Peel Region

Registered recreational boats range in size from small dinghies to large luxury power boats. As a general rule, and for the purpose of this study, boats over 7.5 metres in length are considered to require a pen or mooring. However, there is no finite boat size division between trailer, pen and stacker storage types.

Boats over 24 metres in length are commonly referred to as super yachts. Whilst Perth is the registered home to relatively few super yachts (18) there is evidence that this is a growth area and some facilities may be required for boats of this size outside of Perth.

4.1 Growth Predictions in Population and Boat Numbers

There are a number of statistical models and approaches available that can be applied to predicting population growth and boat number projections. The DoT has sought advice and investigated a number of alternative approaches to establish a level of confidence in the projections presented in this report.

4.1.1 A Discussion on the Statistical (Extrapolation) Process

A statistical study such as this utilises regression lines to project out to future events (extrapolation). The further the data is extrapolated the greater the chance of inaccuracy.

Factors that could lead to future inaccuracies in this study, and which cannot be easily incorporated into the model, might include:

- economic changes in WA's recent boom and bust cycles being reflected in boat sales and boat registrations;
- changes to regulations and legislation, including potential changes in recreational fishing legislation, to restrict fish catches;
- variations in fuel prices may have an impact;
- large unexpected changes in population;
- significant improvements in boat construction technology, better-storage systems, and improved fuel efficiency; and
- a relative decrease in the price of boats (due to technological improvements in boat construction) is already showing some signs of influencing the markets.

Any method of statistical projection can be varied by a range unpredictable factors such as those listed above. However for the purpose of planning new facilities, long range estimates of future demand are essential.

4.1.2 Microsoft Excel Derived Statistics

This methodology used the data for the Peel region as a whole as a base for extrapolation. The results are shown in Appendix 2. In July 2007 the DoT sought an independent review (of the methodology used for the Perth Recreational Boating Facilities Study) by the Department of Fisheries Recreational Fishing Research operation. The same methodology has been applied to this study for the Peel region. The following advice was received:

"The analysis was suited to the available data on population and boat ownership for the Perth metropolitan area. The predictions assume that current trends will continue which is reasonable given the data available. The methodology is statistically sound and suitable for estimating growth in the number of recreational boats and future needs".

4.1.3 Forecasting with Exponential Smoothing State Space

As a check against the Excel derived projection models, an alternative forecasting system¹ utilising “Exponential Smoothing” was investigated. The Department of Planning’s Demographic office was engaged to independently model the data² using alternative software and to reproduce the projections prepared in the Study.

The data provided by the Exponential Smoothing method was closely matched (high correlation) with the Excel derived method. For the purposes of this study, the Excel derived method will be used. An ongoing review of the statistical data against the available modelling approaches will be undertaken to verify the projections are accurate and on target. The chosen projection for this current Study is provided in Appendix 2.

4.1.4 Population Growth Predictions

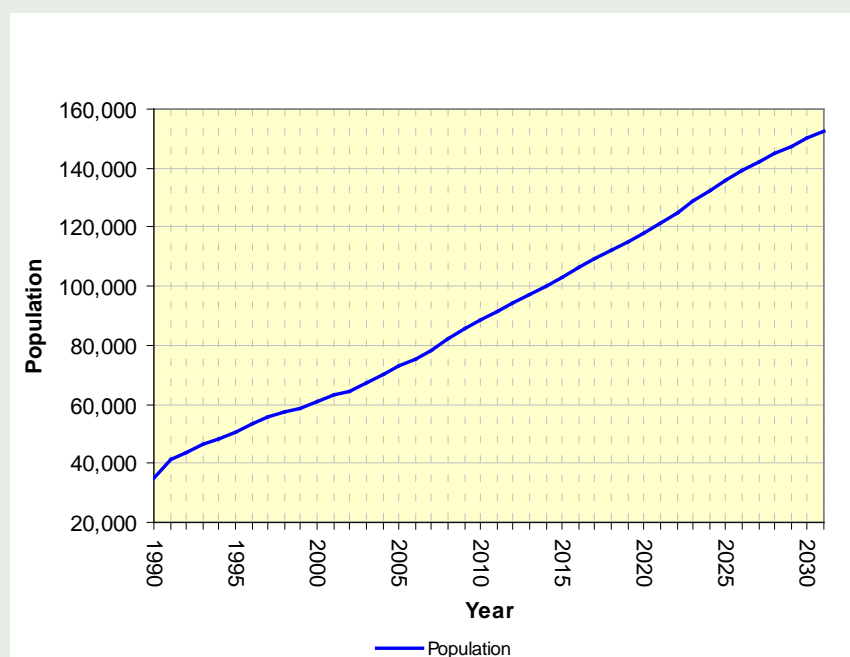
The population growth in WA is projected to increase steadily over the next 20 years. The State recorded the second fastest population growth of all the states and territories in 2003/04, increasing by 1.7 per cent³.

To determine the population projection for the Peel region, individual projections for the City of Mandurah and the Shires of Murray and Waroona were calculated from data released by the Western Australian Planning Commission (Department of Planning) in the report, *WA Tomorrow*⁴.

WA Tomorrow figures have since been adjusted in light of new estimates from the Australian Bureau of Statistics (ABS). These estimates vary slightly from the data used to provide the population projections outlined in the *WA Tomorrow* report. The City of Mandurah and Shire of Murray figures have subsequently been adjusted to account for this difference.

The current projections indicate that the Peel’s population is expected to grow at approximately 2.64 per cent per annum through to 2031⁵.

Graph 1. Projection of the Peel region Population to 2031



1 *Forecasting with Exponential Smoothing: the State Space approach* Hyndman R.J., Koehler A.B., Ord J.K., Snyder R.D. 2008 Springer

2 *Metropolitan Perth Local Government Areas. Recreational Boating Predictions 2008-2025* DPI Technical Report No 445 February 2008

3 Australian Bureau of Statistics *Western Australia at a Glance* Cat No. 1306.5 2005

4 *WA Tomorrow* - Population projections for planning regions 2004 to 2031 and local government areas 2004 to 2021

5 Australian Bureau of Statistics Estimated Resident Population figures from Census Rebasing (1996, 2001 and 2006), 1990 figures from 3311.5 (published in 1992).

4.1.5 Boat Registration Predictions

Table 3 shows the predictions of total boat numbers and the corresponding rate of boat ownership for the DoT's selected growth scenario. This table is a summary of the information presented in Appendix 2.

Table 3. Predicted Boating Increases to 2031

Year	Number of Boats			Population of Peel	Boats per 1,000 Population		
	0-7.5m	>7.5m	Total		0-7.5m	>7.5m	Total
2009	8,099	634	8,733	85,856	94.3	7.4	101.7
2016	10,434	1,084	11,518	106,256	98.2	10.2	108.4
2024	13,103	1,819	14,922	132,156	99.1	13.8	112.9
2031	15,719	2,719	18,438	152,456	103.1	17.8	120.9

4.2 Boat Registrations and Population

At the end of December 2009 there were some 8,733 licensed recreational boats in the Peel region, with 92.7 per cent being less than 7.5 metres in length. Table 4 shows the DoT's historical recreational boat registration data broken down into size groupings against population figures for the Peel region from 1990 to 2009. For the complete projection table refer to Appendix 2.

Boat registration is required if a boat has a motor or is fitted for one. As such yachts, canoes, surf-cats and tenders to larger boats are not required to be licensed, and are unlikely to have been reflected in the statistics provided. However these craft often utilise public boat launching facilities.

Table 4. Historical Peel Boat Registration and Population Records

Year	Number of Boats			Population	Boats per 1,000		
	0 - 7.5m	> 7.5m	Total		0 - 7.5m	> 7.5m	Total
1990	4,153	139	4,292	34,937	118.9	4.0	122.9
1991	4,359	137	4,496	41,030	106.2	3.3	109.5
1992	4,410	162	4,572	43,401	101.6	3.7	105.3
1993	4,614	182	4,796	46,577	99.1	3.9	103.0
1994	4,941	200	5,141	48,288	102.3	4.1	106.4
1995	4,995	198	5,193	50,656	98.6	3.9	102.5
1996	5,257	224	5,481	53,164	98.9	4.2	103.1
1997	5,486	235	5,721	55,458	98.9	4.2	103.1
1998	5,592	237	5,829	57,506	97.2	4.1	101.3
1999	5,872	243	6,115	58,818	99.8	4.1	103.9
2000	5,998	272	6,270	61,139	98.1	4.4	102.5
2001	6,333	289	6,622	63,276	100.1	4.6	104.7
2002	6,594	312	6,906	64,290	102.6	4.9	107.5
2003	6,933	358	7,291	67,052	103.4	5.3	108.7
2004	7,066	379	7,445	70,345	100.4	5.4	105.8
2005	7,322	466	7,788	73,004	100.3	6.4	106.7
2006	7,683	494	8,177	75,561	101.7	6.5	108.2
2007	7,997	584	8,581	78,375	102.0	7.5	109.5
2008	8,194	638	8,832	82,426	99.4	7.7	107.1
2009	8,099	634	8,733	85,856	94.3	7.4	101.7

4.2.1 Observations from the Data

When analysing predicted trends it can be noted that the rate of recreational boat ownership rises considerably from 101.7 boats per 1,000 head of population in 2009 to 120.9 per 1,000 head of population in 2031. This level of boat ownership is quite high when compared to the current level of ownership in the Perth metropolitan area of 32.4 boats per 1,000 head of population.

Boat ownership in the Peel region is increasing every year both absolutely and relatively (boats per 1,000 head of population) and with this comes a greater demand for boat launching and mooring facilities. From 1990 to 2009 there has been a small but noticeable trend towards larger boats (those greater than 7.5 metres) increasing from 3.2 per cent (139 boats) in 1990 to 7.3 per cent (634 boats) in 2009.

While the forecasts indicate that local smaller boat numbers will almost double, it is particularly relevant to observe that larger boats (greater than 7.5 metres in length) are forecast to quadruple. Boats in this size range generally require a water based pen or mooring. Possible reasons for increases in boat sizes may include increased affluence and advances in boat building technologies leading to larger and lighter boats, many of which are now trailerable.

The forecast boat numbers need to be considered alongside the Department of Fisheries' observations that on a good boating day approximately 50 per cent of the boats on the water in the Peel region will be visitors from elsewhere, predominantly Perth¹. These forecasts, supported by Department of Planning's demographic reviews, clearly demonstrate an expected growth in facility demand in the Peel region.

¹ Fisheries Research Report No. 127, Department of Fisheries, 2001



5. Future Planning for the Peel Region

The Peel region is subject to many planning initiatives and studies by other agencies. Some of these are complete, some are in progress, and yet others are ongoing. This Study has briefly examined those key reports, studies and initiatives that are readily available to identify issues relevant to boating facility development in the Peel region and to provide comment.

5.1 Directions 2031 and Beyond

In August 2010, Minister Day released a document titled *Directions 2031 and Beyond - Spatial Framework for Perth and Peel*¹. The document is a spatial framework, a high level strategic plan that establishes a vision for future growth of the Perth and Peel regions, and provides a framework to guide the detailed planning and delivery of housing, infrastructure and services necessary to accommodate that growth.

It examines some of the strategy's underlying assumptions in the context of contemporary growth trends and the existing structure and form of the city. It encompasses all land within the Perth and Peel region schemes. It represents the highest level of strategic land use planning for the city. The document identifies six planning sub regions, one of which is the Peel region.

The Peel sub-region is situated immediately south of the Perth metropolitan region boundary, and comprises the local government areas of Mandurah, Murray and Waroona. The area is characterised by an extensive coastal plain stretching from the Indian Ocean in the west to the Darling Escarpment in the east. The coastal plain contains three major river systems (Serpentine, Murray and Harvey rivers) that drain into the Peel-Harvey Estuary, and a system of inter-connected wetlands (including the internationally recognised and Ramsar registered Peel-Yalgorup system), which contribute to the complex hydrology of the area.

The sub-region has experienced significant population growth over the past decade, with much of this growth occurring in the coastal city of Mandurah. *Directions 2031* estimates that by 2031 the population of the Peel sub-region will have grown by 50 per cent². This level of growth will place significant pressure on existing infrastructure and will need to be carefully planned to ensure it does not unduly impact on the sensitive environmental features of the area.



¹ "Directions 2031 and Beyond – Spatial Framework for Perth and Peel", Western Australian Planning Commission August 2010

² "Directions 2031 and Beyond – Spatial Framework for Perth and Peel", Western Australian Planning Commission August 2010

5.2 City of Mandurah

The City of Mandurah has a boat ownership rate of 89.1 boats per 1,000 head of population (almost 6,100 boats) as at 2009¹. This is forecast to rise to 113.6 boats per 1,000 head of population (12,550 boats) by 2031.

Forecast growth in boat numbers within the City of Mandurah indicates demand for a further 1,500 boat moorings by 2031. A portion of this demand may be met by mooring facilities as provided within canal developments either underway or planned. However this is somewhat offset by the fact that a high percentage of boats kept in the Peel region are not locally registered and also from the pen demand from the Shire of Murray which does not currently have a marina facility. Clearly there will continue to be growing demand pressures on marina facilities in the Peel region and the City of Mandurah in particular.

The forecast growth in trailer boats indicates that boat numbers will increase from approximately 5,600 to over 10,600 by 2031. Fortunately some capacity already exists at existing facilities and with improvements such as extensions to service jetties and car trailer parking areas the requirement for additional new facilities to 2031 could be reduced.

Beyond the expansion capacity of existing facilities it is anticipated there will be significant demand for new boat launching infrastructure.

The City of Mandurah has released a draft Master Plan entitled *Mandurah Foreshore Focus 2020 Vision*², as a vision for the future development of the City's foreshore. The Mandurah Estuary is a major recreational resource for local people, tourists and residents of Perth. Water based activities are popular and the area's attraction as a holiday and tourist destination is closely linked to fishing and crabbing in the estuary.

The aim of the Plan is to outline a clear vision for the Study Area, which will guide the future development and use of the foreshore and waterways, in addition to a number of key locations adjacent to the foreshore. The Plan identifies the need to provide additional boating facilities in Mandurah and the desire of the boating/sailing community to examine the opportunity for an expanded marina.

¹ Australian Bureau of Statistics Estimated Resident Population figures from Census Rebasing (1996, 2001 and 2006), 1990 figures from 3311.5 (published in 1992).

² *Mandurah Foreshore Focus 2020 Vision* City of Mandurah April 2007

The recommendations seek to balance the provision of new boat moorings on the ocean side of the existing marina with the need for commercial development to help economically sustain the project, provide appropriate parking facilities, minimise the impact of the development on views from existing residences and to provide high quality community facilities. The Plan outlines a number of opportunities/recommendations.

- Additional marinas built on the seaward side of the existing Mandurah Ocean Marina, and Mary Street Lagoon.
- Provide berthing facilities within Mandjar Bay associated with the development of the Peninsular site and enhanced public short term facilities within the bay. This will require dredging of the western side of the bay.
- Provide short term parallel berthing and short stay visitor berthing to the boardwalk areas between the Peninsular site and the Mandurah Ocean Marina entrance.
- The provision of piled moorings on the western side of the main navigation channel against Fairbridge Road Bank south of the Mandurah Ocean Marina entrance, and on the eastern side of the channel just north of the marina entrance when the outer marinas are developed.
- In particular, there is strong and growing demand from visiting boating enthusiasts wanting short stay holiday accommodation with easy access to their moored boats. The extensive Mandurah waterways offer this potential.
- A possible marina expansion on the northern side of Breakwater Parade to provide additional boat moorings would require commercial development to assist with the feasibility of the marina construction. Such development should include opportunity for tourist accommodation, residential, a small amount of retail, restaurants and cafes.
- Rehabilitate Soldiers Cove peninsula through boat activity management and environmental remediation.
- Promote 'hire and drive' and local boat storage facilities.
- Increased boat mooring/pen facilities and accommodation and the requirement for an assessment of boat movement patterns in the Study Area.



Figure 1. Mandurah Foreshore Focus 2020 Vision Proposed Estuary Development



As an extension to the *City of Mandurah's Foreshore Focus 2020* plan the City has also released its *Civic and Cultural Precinct Plan*¹. The precinct is located to the north of the Mandurah city centre and to the east of the new Mandurah marina development, incorporating Mandjar Bay. This plan seeks to create a lively civic and cultural precinct. The plan includes a revitalisation of the Mandurah waterfront, by improving Mandjar Bay and the Administration Bay foreshores.

Some of the water based opportunities identified by the plan are:

- access to the site by water could be improved with additional short term and tourist boat berthing;
- increase opportunities for day visits from boat owners; and
- a new jetty and berthing area will provide increased casual boat access and the potential for charter boats and water taxis.

The City is currently investigating opportunities to deliver new short stay boating facilities in Mandjar Bay in the short term.

Recommendations	
1.	Encourage existing facilities in the Peel region to be developed to their full potential before new facility proposals are pursued at nearby locations.
2.	Support the City of Mandurah's Foreshore Focus 2020 Vision marina development proposals subject to appropriate environmental and engineering studies being completed.
3.	Support the boating facility initiatives proposed in the Mandurah Foreshore Focus 2020 Vision report particularly in relation to short stay and boating destination initiatives.
4.	Support the development of short stay boating facilities in Mandjar Bay subject to community support and resolution of design constraints including adequate water depth. (Medium term)

¹ Civic and Cultural Precinct Plan, City of Mandurah, 2007

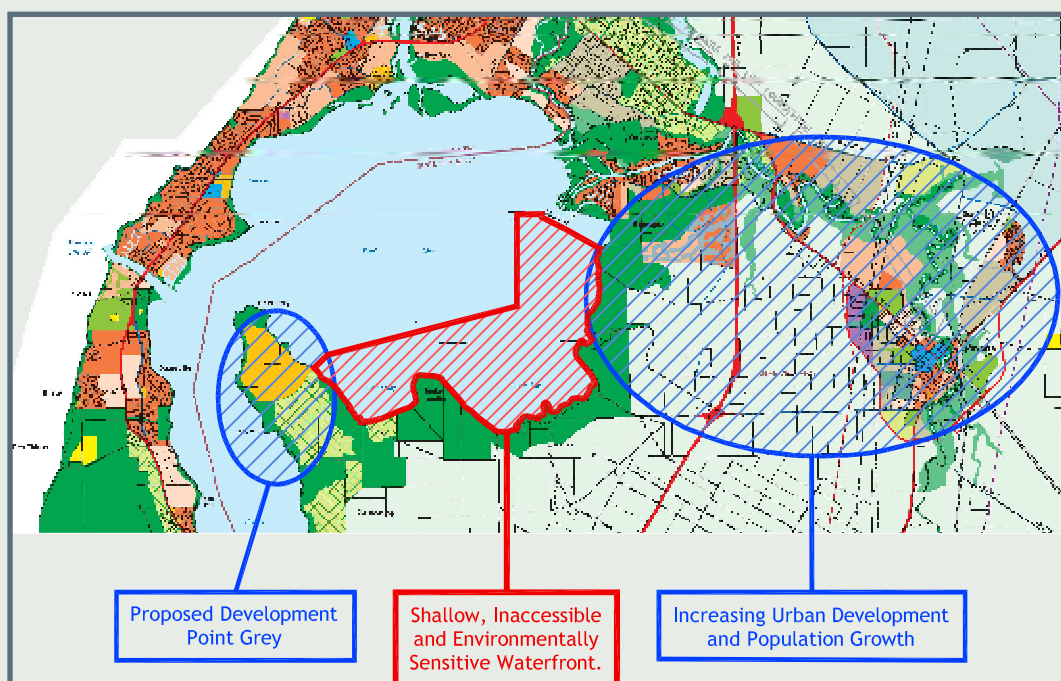
5.3 Shire of Murray

5.3.1 Boating Facility Challenges in the Shire of Murray

The Shire of Murray represents one of the most challenging areas in the Peel region with regard to potential boating facility development. Whilst the Shire has a high rate of boat ownership (174.4 boats per 1,000 as at 2009¹) along with substantial areas of waterfrontage on the Peel Inlet, Harvey Estuary, Murray River and part of the Serpentine River, the opportunities to develop or expand boating facilities in the Peel region are considered to be limited.

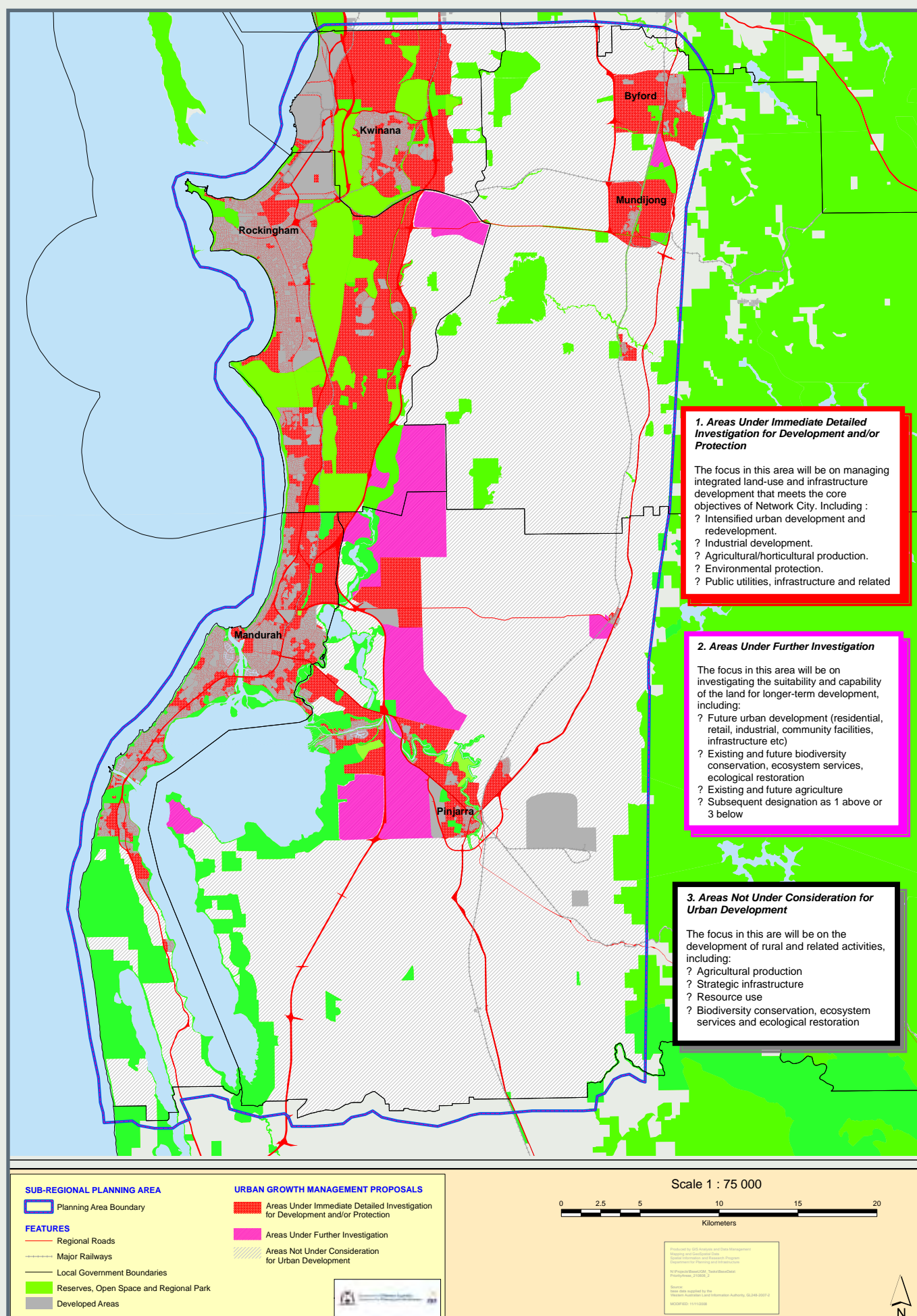
Many areas within the Shire of Murray are expected to grow significantly in the course of the next decade as described by documents such as *Directions 2031 - Draft Spatial framework for Perth and Peel*. It is reasonable to anticipate that boat ownership in the Shire of Murray will remain high and, based on conservative projections, boating facilities within the Shire will become inadequate during the planning horizon considered by this Study.

Figure 2. Shire of Murray - Growth in facility demand versus waterfront access



¹ Australian Bureau of Statistics Estimated Resident Population figures from Census Rebasing (1996, 2001 and 2006), 1990 figures from 3311.5 (published in 1992).

Figure 3. Southern metropolitan and Peel Region growth strategy



A number of new or planned development centres in the Shire of Murray will contribute to population growth in this area. Significant land developments include:

- Point Grey: 270 hectares.
- Austin Cove: 270 hectares - Plans submitted to Council propose 2600 lots.
- Ravenswood: 180 hectares urban zone - 860 lots already released with more proposed.
- Murray River Country Estate: 250 hectares comprising 3200 lots total with approximately 370 lots released so far.

The Shire of Murray is faced with significant challenges in regard to the future provision of recreational boating facilities and some of these include:

1. A growing population which (by current indications) will have one of the highest rates of boat ownership in Western Australia.
2. A general lack of naturally suitable sites for boating facility development.
3. Considerable stretches of waterfront land abutting vast extents of shallow water which are problematic for the following reasons:
 - Acid Sulphate Soils.
 - Requirement for dredging.
 - Wildlife Habitats.

The Shire of Murray currently has nine boat launching facilities within its boundary providing an estimated 12 ramp lanes and parking capacity for approximately 260 car / trailer units.

From recent ramp surveys it is noted that on peak boating days ramp usage in the Shire of Murray is approximately 200 boats with some facilities in overflow. It is to be noted that the most popular facilities are those downriver and that some upriver facilities rarely reach peak capacity. Future demand and environmental considerations will likely see lower river and estuary access locations continue as favoured future development sites.

The boat launching ramp at Riverside Drive is the most popular facility with peak usage recorded at over 70 trailers on site, mostly parked in an overflow arrangement. This facility is located on the Serpentine River, north of the Murray River and would cater for residents from the City of Mandurah, Shire of Murray and visitors.

It is also noteworthy that projections for larger boats (over 7.5 metres) in the Shire indicate a growth of close to 600 boats by 2031. Typically these boats require on water mooring facilities and with no existing marina in the Shire of Murray this facility demand will likely be directed towards facilities in Mandurah and possibly a new marina at Point Grey. The developers of Point Grey have suggested that a 300 boat marina may form part of their development.

No other potential marina developments have been identified within the Shire of Murray.

The problems relating to suitable locations for facility development are particularly relevant to the estuary foreshore between South Yunderup and Point Grey where there is little likelihood or potential for any facility development. However, there is a clear future demand for additional facilities in the Shire of Murray and if some portion of this demand is to be addressed within the Shire then new or expanded facility locations will need to be identified and developed.

Whilst demand for facilities on the eastern side of the Peel Inlet and Harvey Estuary is likely to grow in line with residential expansion there are few locations that present as suitable sites. A general principle in relation to boating facility development is that existing facilities should be developed to capacity before new sites are developed. The following observations and considerations are provided:

- The existing boat ramp at North Yunderup is undersized and requires closure, expansion or relocation. Furthermore it is the only ramp on the northern shore of the Murray River close to Pinjarra Road;
- Community consultation has taken place in North Yunderup which has shown that the community is against any change to the existing launching facility on Culeenup Rd (i.e. maintain the ramp as a local facility for locals). However there is significant community support for ongoing investigations into a new launching facility to be constructed at the end of Tonkin Drive¹;
- It is noted that the Shire of Murray is investigating opportunities for the relocation of the North Yunderup facility and this investigation is supported by this Study;
- The Perth-Bunbury highway has significantly decreased the travel time for Perth day trippers to the Peel region and this already has increased the number of users to facilities, especially those located on the northern and eastern banks of the estuary system; and
- Any proposals for significant facility developments along either the Murray or Serpentine Rivers are unlikely to receive either community or environmental support.

5.3.2 South Yunderup Boat Launching Facility

The establishment of a boat launching facility to service communities to the south of the Murray River with capacity to accommodate a significant portion of the demand from the growing adjacent population within the Shire of Murray is considered important.

Whilst any new facility proposal is likely to be contentious, the location considered to have realistic potential is either on or adjacent to the South Yunderup bund wall (refer figure 4). Government records identify this bunded area as having been illegally developed as a “temporary construction feature” that was established during the development of the South Yunderup Canal system. Whilst this bunded area is now recognised as a community asset, a project to include a boat ramp and associated facilities would have the potential to enhance the amenity and facilities of the area generally.

The benefits of building a boat launching facility at this location include:

- improvement to the access channel;
- potentially good wind and wave shelter in the peak boating season;
- potentially good road connections to future residential developments and surrounding areas;
- room to expand the facility and room for car/trailer overflow parking; and
- protection for the bund wall and assistance in keeping the lagoon in an improved condition.

An alternative site nearby that has been considered for expansion is the existing Warma Way boat launching facility. There are a number of factors which make this location less favourable than the South Yunderup bund wall option. These are:

- vehicle access restrictions. The only access would be via a series of suburban roads through existing residential housing estates;

¹ Communication with the Shire of Murray. The Community group in support is the North Yunderup Community Association.

- the new facility would encroach on the access to the existing canal development and restrict accessibility;
- this site would offer no shelter from the dominant wind in the peak boating season; and
- there would be no room for car/trailer overflow parking.

Figure 4. Aerial photo of the Yunderup area



The development cost of such a facility would be significant and funding and maintenance considerations would need to be identified. Typically such a facility would be owned and maintained by the local government authority. The DoT's Recreational Boating Facilities Scheme may be able to provide some funding assistance and contributions from local land developers in the surrounding areas should be sought. The introduction of a parking fee or other such cost recovery arrangements will assist in offsetting ongoing maintenance costs and potentially also provide funding assistance towards the maintenance dredging of the South Yunderup entrance channel which this facility would share.

5.3.3 Point Grey

The proposed development at Point Grey is noted, as is the concept for this development to provide a marina. A marina established in this location could service a significant portion of community demand with respect to boat pens. The establishment of boat pens elsewhere on the eastern side of the Peel and Harvey Estuaries is considered problematic due to shallow water and environmental sensitivities. Should the marina proposal at Point Grey proceed, then the inclusion of a public boat launching facility should also be encouraged.

The proximity to the Dawesville Channel, with good access to ocean waters from the eastern side of the Harvey Estuary, lends support to the development of this facility. However, the proposal remains subject to the necessary environmental and engineering approvals.

A development site such as this has the potential to provide a new tourism and recreational node. On this basis the inclusion of maritime facilities to accommodate short stay visitors, with facilities should be established.

Figure 5. Point Grey future development



Recommendations	
5.	Encourage and support the incorporation of a waterside facility at the proposed land development at Point Grey, subject to appropriate environmental and engineering studies being completed and the relevant government approvals being obtained.
6.	Incorporate a public boat launching facility in the Point Grey marina subject to appropriate environmental and engineering studies being completed and the relevant government approvals being obtained.
7.	Develop Point Grey as a boating destination with facilities to cater for short stay visitors subject to appropriate environmental and engineering studies being completed and the relevant government approvals being obtained.
8.	Investigate opportunities to utilise the site adjacent to the South Yunderup bund wall dredge spoil area and opposite Wellya Crescent for the development of a new regional boat launching facility.
9.	Support the Shire of Murray's investigation into an alternative site for the North Yunderup (Culeenup Road) boat ramp.

5.4 Shire of Waroona

The Shire of Waroona ranges from the ocean to the Darling Range and incorporates the localities of Waroona, Hamel, Preston Beach and Lake Clifton. The Shire has a boat ownership rate of 65.9 boats per 1,000 head of population as at 2009¹ which is forecast to rise to 118.2 boats per 1,000 by 2031. Similar to the Shire of Murray, the opportunities to develop or expand boating facilities in the area are considered to be limited.

There are two main locations within the Shire for recreational boating.

5.4.1 Preston Beach

Preston beach is located about 25 minutes drive west of Waroona and is one of the few locations in the Peel region that provides direct access to the ocean. Being a beach launching facility it can only be accessed by 4 wheel drive vehicles. Close to the beach is a children's playground, lawn area with shady trees, free electric barbecues and an ablution block with disabled facilities. This is an exposed location and safe launching conditions are not common due to wind and waves and lack of available shelter.

Figure 6. Preston Beach



5.4.2 Waroona Dam (Lake Navarino)

Waroona Dam was built on Drakes Brook with work completed in 1966. The reservoir known as Lake Navarino covers an area of 145 hectares with its primary use being irrigation. It is also used extensively for recreational activities such as water skiing and freshwater fishing².

The Department of Water currently have the reserve vesting management order for Lake Navarino. A '2003 Waroona Waterways Recreation and Tourism Master Plan' was prepared by the Water Corporation (by consultant Regeneration Technology Pty Ltd) in consultation with the Shire of Waroona, Department of Water, Department of Environment and Conservation and the community.

Whilst use does not occur year round, most activities are seasonally restricted by regulations, water levels or weather. Taking water for irrigation purposes resulting in extreme water levels and numerous sites use for boat launching does not allow for permanent ramps.

Waroona Dam has been a popular boating destination with locals and visitors since it opened. This has been primarily due to its relative close proximity to Mandurah and Perth, its sheltered waters and family friendly surrounding facilities. There are a number of facilities available at Waroona Dam including picnic

¹ Australian Bureau of Statistics Estimated Resident Population figures from Census Rebasing (1996, 2001 and 2006), 1990 figures from 3311.5 (published in 1992).

² Shire of Waroona website: www.waroona.wa.gov.au

tables, barbecues and toilets. A caravan park and camping ground is also available.

There are no formal boat ramps located at the Dam, however there are several locations on the Dam's edge that provide direct and easy access for a trailerable boat to launch.

Figure 7. Water Ski Boat on Waroona Dam



5.4.3 Future Considerations

It is evident that there are very limited opportunities to develop new or to expand existing boating facilities in the Shire of Waroona. However improvements to existing facilities may be achievable. In the longer term population growth and development may provide other opportunities to develop facilities in the Peel region that are not currently identified. The Shire may consider undertaking a boating facility audit and strategic site investigation to determine opportunities for new and improved boating facilities. The DoT's Recreational Boating Facilities Scheme may be able to assist with funding.

Recommendations	
10.	Support the Shire of Waroona to undertake a strategic site evaluation and audit investigation into boat launching facilities. (Short term)

5.5 Facility Supply and Demand – Potential facility development options

This Study examines the recreational boating requirements of the Peel region now and into the future, with the intention that this will be an ongoing study, reviewed regularly as new data becomes available. For this reason it is necessary to establish a benchmark or datum point from which to commence future assessment and planning. For the purpose of this Study the year ending 2009 has been chosen to represent this datum point.

In considering development timeframes an indicative schedule has been prepared that breaks down the planning horizon of 2031 into three terms: Short Term (within the next 1 to 5 years), Medium Term (the next 5 to 15 years), and Long Term (greater than the next 15 years).

Table 5 examines the forecast demand arising from the growth in recreational boat numbers in the Peel region against the growth capacity of existing facilities. Based on this assessment there is a future shortfall of 1,455 boat pens and 17 boat ramp lanes.

Table 5. Planned facility expansion capacity vs. demand to 2031

Projects	Boat pens / berths	Boat Ramp Lanes	Term
Canal development existing expansion capacity :			
Mariners Cove Canal Development	280		Short
Eastport Canal Development	300		Short
Southport Canal Development	50		Short
Boat ramp lanes :			
Mariner's Cove Canal Development		2	Short
Totals	630	2	
Facility target by 2031 (from Appendix 5 and 6)	2,085	19	
The 'Gap' (New initiatives beyond those already progressing, required to meet the shortfall to 2031)	1,455	17	

Table 6 (below) provides a schedule of potential development options for how this shortfall or "gap" may be addressed. This does not necessarily represent approved proposals and the list is not necessarily exhaustive. The proposals listed are considered feasible and have the capacity to provide recreational boating facilities for a large part of the boating community.

Table 6. Schedule of possible initiatives to address 'The Gap' to 2031

Site	New boat pens / berths	New boat ramp lanes	Term
Bridging 'The Gap' : Potential new facility proposals			
Marina - South East of the Dawesville Channel	400	4	Medium
Boat Stacking - sites to be determined	150		Short - Medium
Point Grey Marina	300	4	Medium
City of Mandurah Foreshore 2020 Plan	800		Medium
South Yunderup Boat Launching Facility		4	Medium
North Yunderup Boat Launching Facility		2	Short
Total	1,650	14	

When the capacity of the Peel region's existing facilities is examined along with the potential provided by new facility proposals, it is recognised that there is a shortfall of 3 boat ramp lanes and a surplus of almost 200 boat pens.

The number of planned boat pens appears to be slightly in excess of the demand, however timing of the delivery of these boat pens will need to be monitored to ensure the new facility proposals are on target.

Given the extent of undeveloped and unplanned sites within the Peel region, it is possible that further new waterside facilities incorporated within land developments may be identified in time, thus helping to alleviate some of the shortfall demand for boat ramps.

As mentioned, these facility proposals have the capacity to provide additional recreational boating facilities, however these need to be considered within the margin of planning over the identified time frame (up to 2031).

5.6 Peel Regional Park

Historically, most management of the Peel region's reserves and waterways has been carried out by local governments (City of Mandurah, Shires of Murray and Waroona) and the relevant State Government authorities including the Department of Environment and Conservation (DEC) and the Department of Fisheries (DoF). This task was proving increasingly difficult as development in the area became more complex. The *Waterways Conservation Act 1976* allowed for the establishment of the Peel Inlet Management Authority (PIMA) with a role 'to preserve or enhance the quality of the environment and amenities of the waters and of the associated land'.

In 1994, the then State Planning Commission released the *Peel Regional Strategy* to set goals and objectives for future land use in the Peel region which, in 1997, gave rise to the *Inner Peel Region Structure Plan*.

PIMA was replaced in 2003 by the Peel Inlet Management Council and on 17 October 2008 by the Peel Inlet Advisory Council, a non-statutory body and the powers of the *Waterways Conservation Act 1976* reverted to the Department of Environment.

In 2003 the Peel Region Scheme came into effect with statutory mechanisms to implement the recommendations of the *Inner Peel Region Structure Plan*. One outcome of this is the establishment of the Peel Regional Park with statutory provisions to:

- reserve the land and waterways that will make up the Peel Regional Park;
- acquire land and waterways for inclusion in the Park. 252 hectares of private land has already been purchased to add to the Park¹;
- compensate affected landowners;
- control the use and development of land within the Park; and
- prepare an Operational Management Plan for the Park.

The Peel Regional Park aims to create a clear delineation of non-negotiable areas of conservation, areas for rehabilitation, recreation and multi-use areas. It will provide protection for the Peel Harvey Estuary and wider catchment area through improved liaison on planning for critical infrastructure and resourcing requirements for the park.

1 *Peel Region Infrastructure Plan* October 2006 http://www.peel.wa.gov.au/data/client/files/269_peel_regional_infrastructure_plan_final.pdf

Recommendations	
11.	Support the planning and approval agencies in the Peel region including Local Governments, the Departments of Transport, Water, and Environment and Conservation in the finalisation of the Peel Regional Park Plan to identify appropriate recreational sites and facilities. (Short term)

5.7 Economic Development and Recreational Management Plan for the Peel Waterways

The *Economic Development and Recreational Management Plan*¹ for the Peel Waterways was commissioned by the former Peel Inlet Management Authority and Waters and Rivers Commission and was completed in August 2002.

The goal of the study was to prepare an *Economic Development and Recreation Plan* for the Peel waterways which will provide for clear and planned use of the waterways and related land based activities. The specific objectives of the plan were to develop strategies to:

1. identify the economic and employment opportunities offered by the waterways;
2. better manage and cater for the development and employment potential of the waterways;
3. identify, promote and manage the recreational opportunities offered by the waterways;
4. protect and enhance the environmental quality of the waterways;
5. protect and enhance the natural diversity of flora and fauna;
6. protect and enhance culturally significant sites;
7. safeguard the scenic qualities of the waterways;
8. promote and protect the tourism potential of the waterways;
9. maximise community involvement in the planning for the waterways;
10. streamline approval processes for management and development on the waterways; and
11. develop and promote 'best practice' in all aspects of the management and development of the waterways.

The Plan included consideration of key sites of regional importance for future recreational, conservation, tourism and institutional uses. A number of these sites were discussed in terms of their recreational significance and more broadly as potential sites for boating facility development. This included references to Point Grey and Dawesville Channel (South East). These sites are also discussed in later sections of this report.

Four strategic active and passive recreation sites including Herron Point, Ravenswood, Nairns and Tonkin Drive Furnissdale and Boundary Island Master Plans are currently in preparation by the Department of Water. When the Master Plans are complete they will be incorporated into the proposed Peel Regional Park Masterplan for consideration.

¹ *Economic Development and Recreation Management Plan*, Water & Rivers Commission, August 2002

6. Environmental Considerations for the Peel Region associated with Boating Facility Development

The waterways of the Peel region are environmentally sensitive. These sensitivities span a broad range of issues including water quality, soils, habitats, wetlands, flora and fauna. As boating activity and the associated infrastructure requirements can lead to environmental impacts, the consultation, planning, design, investigations and ongoing facility management need to be comprehensive.

6.1 Boating Facility Design

Marina facilities, including boat launching facilities, have an inherent level of environmental impact. The appropriate siting and design of these facilities, along with sound management practices, is an essential part of the development of any modern facility. Facilities should be designed to reduce coastal impacts, to have minimal dredging requirements, and where enclosed, to consider water quality and circulation. The associated facility management should be of best practice particularly in relation to potential environmental impacts.

6.2 Dredging and Acid Sulphate Soils

Much of the Peel Inlet and Harvey Estuary is exceptionally shallow and, in many locations, dredging has been required to develop and maintain safe navigable boating access to channels and facilities including to marinas and boat ramps. The *1976 Waterways Conservation Act*, Section 46 and the *Licenses and Waterways Conservation Regulations 1981*, Regulation 16 allow for licensing to dredge, disposal of soil and reclamation.

A dredging management plan is currently in preparation by Oceanica Consulting for the DoT to assist with the long-term management of dredging works in the Peel-Harvey system. The plan aims to ensure the dredging activities are carried out in an appropriate and coordinated manner that will not exacerbate water quality issues including those posed by the presence of acid sulphate soils which are known to exist across much of the Peel region¹.

All new maritime facility developments throughout the Peel region, including canal estates, need to consider and research the environmental implications of any dredging proposal. This is usually the single greatest challenge for any new facility proposal. For this reason and due to the extremely shallow waters (over much of the Peel Inlet and Harvey Estuary foreshore), suitable sites for facility development are rare. Appropriate sites exist where either natural water depth is adequate or where there are existing facilities including dredged channels.

6.2.1 Fisheries Restrictions

The Peel region is well known for its excellent fishing, including crabbing and prawning, and these activities are often associated with recreational boating. Changes to fishing arrangements including restrictions, the implementation of licences and bag limits currently affect the Peel region, and it can be anticipated that further restrictions and limitations will be applied into the future.

In recent times the Peel waterways have been closed to crab fishing for September and October each year in an effort to improve blue swimmer crab stocks in WA.

On 2 July 2009, the Minister for Fisheries announced changes to recreational fishing management in WA. These changes followed an extensive independent review of West Coast demersal (bottom dwelling) scalefish and have been made to ensure the State maintains a high quality recreational fishery for the future.

¹ Oceanica Consulting Pty Ltd, 2007

The main change included:

A state-wide Recreational Fishing from Boat Licence (RFBL) was introduced in March 2010 at an annual fee of \$30. An RFBL is required to undertake any general fishing activity (including crabbing) conducted with the use of a powered boat anywhere in the State. Fishing from kayaks or other boats that are not required to be registered under the *WA Marine Act 1982*, will not need a licence. People fishing from beaches or jetties and shore-based crab fishers will not need a licence except where existing licences already apply.

Detailed information on all changes is available at the Department of Fisheries website:

<http://www.fish.wa.gov.au>

6.2.2 Boat Wash

In February 2009, the Swan River Trust released the *Boating Management Strategy for the Swan Canning Riverpark* which proposes boating management strategies for the Swan Canning Riverpark¹. The aim of the strategy is to facilitate better management of boating activities in the Swan Canning Riverpark without adversely affecting the environment or other river users. The strategy makes recommendations on several areas including:

- boat accommodation including moorings and marinas;
- boat wash;
- boat launching facilities;
- sewage disposal;
- jetties.

Boat wash can have a significant impact on the foreshore. The upper reaches of the Murray and Serpentine Rivers are susceptible to damage from boat wash. Boat wash is also undesirable in canal developments, with signage often placed at the entrance to canal estates warning boats to slow down and avoid creating excessive boat wash.

Figure 8. Boat wash sign at the entrance to a canal estate.



¹ <http://www.swanrivertrust.wa.gov.au>

Figure 9. Example of riverbank erosion



Recommendations	
12.	<p>Manage the impacts of boat wash to preserve and protect the natural environment and artificial waterways in the following ways:</p> <ul style="list-style-type: none">• Signage in canal estates and river systems;• Discourage larger boats from operating in the Serpentine River;• Implement speed restrictions; and• Review the effectiveness of the Swan River Trust’s 2009 recommendations on boat wash as shown in the <i>Boating Management Strategy for the Swan Canning Riverpark</i>.

7. Boating Facility Considerations

7.1 Boat Launching Facilities

7.1.1 Existing

In 2004, the DoT undertook audits of all boat launching facilities in the Peel region to determine their condition, capacity and quality of ancillary amenities. These facilities were reviewed again in 2009¹. The location of Peel’s boat ramps are shown on Map 2 at the end of this report.

The majority of the region’s boat ramps are formal public facilities and are considered to be the primary means for trailer boat access to the navigable waters of the Peel Estuary and the coast. It is noteworthy that 93 per cent of registered boats are kept on trailers and are dependant on such facilities. Public boat ramps are generally available for use 24 hours a day. Some sites charge parking fees. There are also a few small private boat launching facilities within the Peel region.

For planning purposes it is considered that there are currently 24 established public boat launching sites that service the Peel region and these vary from beach launching sites requiring a four wheel drive vehicle to a modern six lane facility complete with finger jetties and sealed carparks.

¹ DPI Peel Region Public Boat Launching Facilities Audit (Technical Report 450)

These 24 sites currently cater for the Peel region's public boat launching needs, servicing around 8,000 local trailed boats together with a similar number of visiting boats that come from outside the Peel area¹, predominately from Perth's metropolitan areas.

Table 7 identifies the 21 existing formalised (non beach) boat launching ramps and their corresponding number of ramp lanes and finger jetties in the Peel region.

Table 7. Established boat launching facilities in the Peel region

Ramp	No of lanes	No of Finger Jetties	Car / Trailer Parking	
			Capacity	Overflow
BIRCH WAY	1	-	10	5
BIRCHLEY ROAD	1	1	20	6
CULEENUP ROAD	1	1	15	-
DAWESVILLE RAMP	4	3	50	50
EASTPORT MARINA	4	2	140	-
FORREST STREET	1	-	40	-
HERRON POINT	1	-	10	5
LEURA STREET	2	-	10	-
MANDURAH OCEAN MARINA	2	1	90	-
MARY STREET	6	4	73	50
MURRAY BEND	1	1	50	10
NAIRN ROAD	5	1	5	10
NOVARA RAMP	4	2	50	30
OLIVE ROAD	1	-	5	-
PARKRIDGE RAMP	2	2	10	10
REDCLIFFE ROAD	1	1	10	10
RIVERGUM ESPLANADE	1	-	8	10
RIVERSIDE DRIVE	2	1	25	20
BATAVIA QUAY/WARMA WAY	2	-	15	-
WATERSIDE DRIVE	1	1	28	30
WHARF COVE	2	-	20	20
TOTAL	45	21	684	266

The DoT encourages the development of existing boat launching facilities to their maximum capacity prior to the development of further facilities. Many of the existing facilities identified in Table 7 above have expansion capacity in terms of ramp lanes, trailer parking and jetty improvements. These improvements should be considered as a first stage in providing improved boat launching capacity in the Peel region. However some of these facilities are already at or close to being developed to their maximum capacity and limited further development may be possible.

¹ Fisheries Research Report No. 127, Department of Fisheries, 2001

The figure below is an example of a well designed four lane ramp with associated facilities. There are finger jetties that provide easy and safe access to a launched boat, dedicated lanes to launch and retrieve, adequate water depths and a well designed car park. Ancillary facilities that are not obvious from the aerial photograph include toilets and lighting. Also included are landscaped areas, shady trees, sandy beaches, rubbish bins and reserved areas for boat rigging, de-rigging and wash down.

Figure 10. Aerial view of the Dawesville boat launching facility



7.1.2 Future

A major attraction of living in the Peel region is the sheltered inland waterways which are also well connected to the ocean providing an excellent boating environment.

The State Government, through the DoT's Coastal Infrastructure Business Unit, is tasked to advise on and approve the development of recreational boating facilities, including those contained within private developments. Many public facilities in the Peel region have been provided via a combination of boat registration fees and local government funding.

There is a fundamental difference between boating in the ocean and on the rivers and estuaries. The more sheltered estuary and river environments allow for longer periods to be spent on the water boating. The duration of ocean boating trips is largely influenced by weather and sea conditions. This typically means that during the popular summer boating season, ocean boaters are likely to launch early and return before the sea breeze makes boating uncomfortable, leading to a rush on ramp facilities over a short period of time following the onset of the sea breeze.

Major factors to be considered when planning for new or upgraded boat launching facilities are their capacity and efficiency. It is important that ocean ramps are designed with safety and efficiency (or handling capability) as the primary objectives. The efficiency of boat launching operations at major facilities can also be improved through traffic management, possibly including the use of a traffic warden (at peak times) who can ensure that orderly and efficient car/trailer movements in the manoeuvring area of the ramp are maintained.

When a trailer parking area exceeds its capacity, it is common for surrounding areas to be subject to trailer parking overflow. At some sites this peak overflow is managed by utilising adjacent reserves, parks and additional on-street parking, often of major concern to local residents. At some locations consideration should be given to the construction of a small hard-standing car park for off-peak use coupled with a tree-covered,

grassed parking for peak usage. This approach may be more acceptable to Peel residents rather than a large area of bituminised car park with little aesthetic appeal and would be more in keeping with the park-like atmosphere of the estuary surrounds.

The Australian Standard Guidelines for the Design of Marinas AS3962-2001 provides guidance on the number of trailer parking bays that should be provided per boat ramp lane (Table 8).

Table 8. Parking recommendations at boat ramps

Parking at a public boat launching ramp			
Area classification	Number of car/trailer spaces for each ramp lane		
	Ramp only	With boat holding structures	With separate rigging and derigging areas
Urban	30 – 40	40 – 50	50 – 60
Rural	20 - 30	30 - 40	40 - 50

Given the Peel region's increasingly urban status, boat launching facility design should be based around the AS3962-2001 requirement of between 40 and 50 car/trailer spaces per ramp lane. However it is recognised that it may be difficult to achieve 40 car/trailer spaces at some of the existing facilities due to limited public/available land – public access near waterways.

When a vehicle with a loaded trailer approaches a ramp lane it may have to wait in a queue to get onto the ramp. Once on the ramp the boat must be launched, the trailer parked and the driver return to the boat before proceeding from the ramp to the open water. This is reversed when retrieving the boat. A waiting and service time of up to 30 minutes to launch or retrieve a boat is considered to be an upper limit that would be acceptable to the average boat owner.

The length of jetties provided at boat ramps can significantly affect the efficiency of the launch and retrieval process, particularly at busy times. By extending the length of a jetty, the numbers of holding berths are increased allowing more time for boat owners to park and retrieve their vehicles. As much of the delay caused at boat ramps is due to the time taken up by dropping off or collecting the car and trailer, locating the car/trailer parking as close as possible to the ramp also helps to reduce wait times and delays.

Figure 11. Typical two-lane boat ramp with finger jetty on the Serpentine River



Over the past five years the DoT has conducted annual surveys of boating activity at boat launching facilities located in the Peel region. The purpose of the surveys is to record periods of peak boat ramp usage and to observe their performance and associated problems. The data is also used to identify trends assisting the DoT to forecasting future demand and boat usage in the Peel region. Map 5, derived from survey data, illustrates the extent to which boat owners are travelling to access boat launching facilities in the Peel region. This is indicative of the popularity of the Peel region as a recreation and tourism destination.

An analysis of where trailer boats are coming from has revealed that under peak boating conditions only approximately 5 per cent of local boats are likely to be in use¹ and of these, approximately 50 per cent of the boats being launched are non-local.

Table 9 is based on current growth projections and visitor numbers and provides a rough guide to the numbers of boats that could be using the Peel waterways in the future on good boating days.

Table 9. Estimate of total number of boats launched on a peak boating day in the Peel region

Year	Peel Registered Boats (< 7.5 metres)	Forecast number of boats launched on a peak boating day (local and non-local)
2009	8,099	810
2010	8,655	866
2011	8,938	894
2012	9,227	922
2013	9,520	952
2014	9,819	982
2015	10,124	1,012
2016	10,434	1,044
2017	10,749	1,074
2018	11,069	1,106
2019	11,395	1,140
2020	11,726	1,172
2021	12,062	1,206
2022	12,404	1,240
2023	12,751	1,276
2024	13,103	1,310
2025	13,461	1,346
2026	13,824	1,382
2027	14,192	1,420
2028	14,566	1,456
2029	14,945	1,494
2030	15,330	1,534
2031	15,719	1,572

Recommendations	
13.	Include beach landing and launching areas when appropriate, adjacent to existing formal boat launching facilities for use by non-powered craft. (Short term)

The following recommendations in relation to existing public boat ramps in the Peel region are proposed (locations are shown in Map. 2). Note: when referring to ramp lane jetties they all have an **active** berth where the boat is initially launched and they may also have a **holding** berth(s) where the boat is held while a vehicle and trailer is parked.

¹ Fisheries Research Report No. 127, Department of Fisheries, 2001

Mary Street Lagoon Boat Ramp, Halls Head (BR 6)

This six lane ramp has only one berth for each ramp. An extension to the finger jetties will increase the berthing capacity leading to improved efficiencies at the ramp. The trailer parking capacity is below the requirements of the Australian Design Standards and therefore the number of formal trailer parking bays needs to be increased. Some reorganisation of the current pen moorings may also be possible to maximise the effective use of this small marina.

Recommendation	
14.	Extend the finger jetties, increase the level of formalised trailer parking and optimise the mooring capacity at the Mary Street Lagoon boat ramp. (Short term)

Novara Boat Ramp, Owen Avenue, Falcon (BR 12)

The two finger jetties at this ramp require extension to provide two holding positions. This will increase the berthing capacity.

Recommendation	
15.	Extend the two finger jetties at the Novara boat ramp. (Short term)

Dawesville Boat Ramp, Crocos Place, Dawesville (BR 14)

Recommendation	
16.	Extend the finger jetties at the Dawesville boat ramp to accommodate additional berthed boats. (Short term)

Parkridge Boat Ramp, Estuary Road (BR 15)

Recommendation	
17.	Extend the finger jetties at the Parkridge boat ramp to accommodate three boats on each side. (Short term)

Rivergum Esplanade, South Yunderup (BR 21)

A jetty with the capacity of two holding berths and one active berth is required at this ramp. The trailer parking capacity should be increased and formalised to complement the ramp.

Recommendation	
18.	Construct a jetty and formalise the trailer parking at Rivergum Esplanade boat ramp. (Short term)

Batavia Quay (Warma Way), South Yunderup (BR 24)

The trailer parking capacity should be increased and formalised to complement the ramp.

Recommendation	
19.	Expand and formalise trailer parking at Batavia Quay (Warma Way), South Yunderup. (Short term)

Wharf Cove (Murray Lakes), South Yunderup (BR 20)

Recommendation	
20.	Investigate berthing arrangements at Wharf Cove, Murray Lakes. (Short term)

Riverside Drive, Furnissdale (BR 23)

The trailer parking capacity should be increased and formalised to complement the ramp.

Recommendation	
21.	Upgrade parking facilities at the Riverside Drive boat ramp. (Short term)

Lakes Road, Greenfields (BR 1), Olive Road, Falcon (BR 13) and Leura Street, Estuary Road (BR 16)

These ramps are inefficient and contribute little to the launching of recreational power boats. It is recommended that these ramps be restricted to non-powered boats and utilised for rowing, canoeing, beach sail craft etc as these pastimes are popular and important. These activities also have a lower environmental impact and are to be encouraged. Lakes Road boat ramp has been closed due to road works involving the Water Corporation.

Recommendation	
22.	Restrict powered boat usage at the Lakes Road, Olive Road, and Leura Street (Estuary Road) boat ramps.

Herron Point and Birch Way (Birchmont), (BR 25 & BR 26)

The Perth-Bunbury highway has significantly decreased the travel time for Perth day trippers to the Peel region and this has increased the number of users to facilities located on the eastern banks of the estuary system.

Recommendation	
23.	Evaluate options to upgrade the Birchmont and Herron Point boat launching facilities. (Medium term)

In the 1996 Study¹ there was a recommendation for a District Launching Facility (Level 4) on or near Leisure Way. In 2007 there was an application to develop the area on the south-west side of the Mandurah Estuary Bridge to be called Bridgewater North. Current proposals for this development indicate that a small craft launching facility may be included as part of the development.

Recommendation	
24.	Investigate opportunities for the development of a new public boat launching facility or non-powered launch site, on the western side of the Mandurah Estuary Bridge close to the Bridgewater North development. (Short term)

7.2 Marina Pens

7.2.1 Existing

The Peel region currently has two significant marinas providing mooring pens and boating services to the local community. These are the Eastport Marina (150 pens) and the Mandurah Ocean Marina (568 pens). The smaller Mary Street Lagoon also provides 58 pens.

The Mandurah Ocean Marina has recently completed the final stages of its development. Beyond some further minor adjustment this marina is unlikely to provide significant numbers of new pens.

A feature of the Peel region is the high number of canal estate developments within which high numbers of private moorings exist. These moorings address some of the pen demand that would otherwise exist within the region's marinas. It is estimated that there are in excess of 2000 canal estate moorings.

Other observations include:

- A search on the 'home' postcode of 320 boats penned at the City of Mandurah's Mandurah Ocean Marina and the Mary Street Lagoon Marina in February 2008 revealed that 58 per cent of the boats were not Peel registered;
- Marina managers currently have long waiting lists for berths; and
- It is frequently stated, particularly by commercial traders, that the lack of available pens in the Peel region is a limiting factor in the growth of boat sales as the purchase or upgrade to a larger boat is prevented because the lack of a mooring.

7.2.2 Future

The forecast growth in boats over 7.5 metres in the Peel region indicates that numbers will increase from approximately 630 in 2009 to approximately 2,700 by 2031. This forecast growth represents a quadrupling in the number of boats registered in the Peel region that will likely require an on-water pen or berth.

¹ Boating Facilities Study for the Peel Region Nov 1996 Dept Of Transport Report 386/96

Mandurah Foreshore Focus 2020 Vision

The *Mandurah Foreshore Focus 2020 Vision* proposes a major expansion to the City's mooring capacity through the development of further marina complexes located either side of the Peel Inlet's ocean entrance. The success of the Mandurah Ocean Marina as a tourism and residential centre provides insight into the City's vision for further similar development. From a maritime facility planning perspective the proposals could address a significant portion of the growing demand for facilities for larger boats and, subject to environmental, social and engineering considerations, should be supported.

It is estimated that the marina proposals within the *Mandurah Foreshore Focus 2020 Vision* could provide berths for up to 800 boats.

The Strategic Sites Policy Area

(The Economic Development and Recreational Management Plan for the Peel Waterways, August 2002)

The Strategic Sites Policy Area¹, report was prepared for the Water and Rivers Commission (now the Department of Water) by Everall Consulting Biologist. This report identified two potential locations in the Peel Inlet for the construction of marinas:

Site 1: Dawesville Channel (South East)

In relation to the Dawesville Channel (South East) site, the Strategic Sites Policy report states:

"This site is a mostly publicly owned area of bushland and reclaimed land containing a bowling club, sailing and leisure facilities. It is understood that the area has been the subject of several development proposals ranging from commercial and recreational uses through to retention as a bushland area. This is probably the last large area of strategically located public land available on the estuary and thus has considerable potential value for the future. In planning for the short term or interim use of the land, long-term options should be kept open and protected, so that the coming generations do not have to incur high compensation costs to redevelop the area for contemporary purposes. For example, leases for any club sites, commercial ventures and say, private moorings or recreational facilities offshore, should be short to medium term without the requirement for compensation for capital improvements on termination if the area is required for other purposes. Any development should ensure there is adequate provision for public open space needs, particularly along the foreshore."

A new marina in this location close to the Dawesville Channel would be well located in relation to a growing area of demand, proximity to boating destinations, sheltered water and access to deep water. Whilst this site may also lend itself to other land uses and facilities a public marina component could be highly compatible. This area has a number of unique advantages:

- it is strategically located close to the Dawesville Channel to give good, protected access to the sea as well as direct access to the estuary. This would alleviate some of the pressure from the Mandurah Ocean Marina entrance;
- this site has a large area of public land suitable for on-shore facilities;
- a marina in this area could accommodate up to 300 larger boats; and
- this marina could include a boat launching facility.

¹ *Economic Development and Recreation Management Plan*, Water & Rivers Commission, Aug 2002

Recommendations	
25.	Investigate opportunities for the development of a new boating facility development within the Regional Open Space reservation adjacent to the Harvey Estuary on the southern side of the Dawesville Channel.

Site 2: Point Grey

In relation to the land at Point Grey the Strategic Sites Policy report states:

“Point Grey is proposed to be zoned Urban Deferred in the PRS and subject to environmental assessment, a marina has been proposed for the western side of the point, in association with the foreshore open space and the future urban development. Like Herron Point and Birchmont, it is at the end point of an access from the Peel Highway deviation and is likely to experience very high use from day visitors. The planning issues are to ensure that there is sufficient future capacity in the development to accommodate day visitor parking, boat launching, and tourism facilities; and that there is sufficient foreshore open space to accommodate likely recreational demands.”

Since this report has been prepared significant work has been undertaken by the land owner to prepare development concepts for this land and to investigate the environmental issues associated with its development. In addition, the developer has been successful in having the zoning modified to Urban from Urban Deferred. Current concepts for the land include the establishment of a marina with pens and boat launching facility.

Point Grey is located close to the Dawesville Channel and represents a rare location on the Peel and Harvey Estuary's eastern shoreline where boating access could be achieved. With significant population growth predicted in the Shire of Murray, any waterside facilities in this location are anticipated to be popular. This site has the potential to be highly desirable as a recreational and tourism destination.

7.3 Dry Storage - Boat Stackers / Boat Lifters

7.3.1 Existing

There is currently only one boat stacking facility in the Peel region, Mandurah Boat Stacking, located in the Mandurah Ocean Marina. The boat stacker has a storage capacity of approximately 45 boats up to about 9 metres in length. This operation also includes a boat lifting facility available to the public for boat servicing purposes. The boat lifting facility is a unique and important service to the Peel region with owners otherwise needing to complete maintenance work in Perth or Fremantle.

Boat stacking systems can deliver substantial numbers of dry storage spaces and have the potential to play a significant future role in boat storage. With a trend towards smaller housing lot sizes (where boats cannot be stored at home) and higher density living in the Peel region, boat stacking facilities are likely to become increasingly attractive. Boat stackers are characterised by the following features:

- Forklifts are used to launch and retrieve boats to the owners' requirements.
- Servicing of the boat, including washing and fuelling, can occur on site.
- Modern stackers can accommodate boats up to 10 metres, in some cases even bigger.
- Boats in stacks do not require antifouling treatments and are often subject to less deterioration.
- Boat stackers may not be compatible visually or operationally with the surrounding area.

- Recent boat stacker buildings constructed in the U.S.A. have been developed to look like attractive buildings or apartments and in some cases include restaurants and club lounge facilities.
- Boat stackers are relatively compact and do not require extensive car parking areas.

Figure 12. Design for a Boat Stacker with reduced visual impact (Port Sanibel Marina, Fort Myers, Florida)



Figure 13. Boat Stacker at Mandurah Ocean Marina



7.3.2 Future

Increasingly, Peel residents live in higher density dwellings including apartments and on smaller suburban blocks. As such the ability for many boat owners to store their boat at home is diminishing. With more than 90 per cent of the Peel region's registered boats kept on trailers, the demand for boat storage facilities is growing. Modern boat stackers are increasingly capable of storing larger boats and, when considered against the shortage of on-water pens and moorings, the use of a boat stacker for storage of boats over 7.5 metres is now becoming an attractive option. This is already reflected in the Perth metropolitan area where pen fees have escalated in recent times.

Boats stored in stacks benefit from not requiring antifouling, are generally kept cleaner and are less exposed to the marine elements leading to deterioration and loss in value. In the future, the migration of many smaller penned boats to stackers may free up on water pens for larger boats in the Peel region.

Recommendation	
26.	Support the development of boat stacking facilities in locations where they can be demonstrated to be compatible with the surrounding land use.

7.4 Permanent Swing Moorings

7.4.1 Existing

It is estimated that there are approximately 238 swing moorings (Appendix 4) of varying construction and quality located throughout the Peel Inlet and Harvey Estuary and in various locations along the Murray and Serpentine Rivers.

Currently there are no controls on swing moorings in the Peel Inlet however, the DoT is investigating the merits of proclaiming the waterways of the Peel region as a mooring control area. It is anticipated that designated and managed mooring areas will, in time, be established within the gazetted mooring control area of the Peel region.

For the Perth metropolitan area it was found that only 40 per cent of established swing moorings are used as the primary storage location for private boats. Many are only used on a seasonal basis.

7.4.2 Future

The transition to a formally licensed and managed moorings control area in the Peel region would occur in the same way as the transition from uncontrolled to controlled moorings has occurred in Mangles Bay, Rockingham. Further study will be required to select areas for establishing swing moorings and areas where moorings are banned. The DoT has conducted preliminary audits of existing mooring sites in the Peel region.

Recommendation	
27.	Progress the implementation of a mooring control area for the Peel region and proceed to establish a number of managed, permanent swing mooring areas. (Short term)

7.5 Short Stay Facilities

The Peel region's waterways have traditionally been utilised by fishermen and crabbing enthusiasts and this is likely to continue despite increasing fisheries regulations. It should be recognised that with the establishment of new marinas, houseboat operations and residential canal estates, an increasing number of boats are likely to be used for more passive activities. These activities include cruising, day tripping, picnicking and, increasingly, as an alternative form of road transport. It is perhaps in this area of demand that the biggest improvement in facilities could be made in the provision of attractive destinations, short stay facilities, information guides and services.

The forecast growth in boat numbers, and in particular the growth in larger boats in the Peel region, highlights a requirement to plan for the creation of destination nodes with appropriate mooring facilities. Houseboats currently operating in the Peel region often have their own particular requirements for short stay and overnight facilities and their operators well understand the need for these types of facilities.

The development of well located and planned short stay facilities associated with destination nodes have the potential to add to the tourism appeal and vibrancy of the Peel region.

7.5.1 Existing

Throughout the Peel region's waterways there is a significant number of destinations where boat owners can visit, tie up and moor including marinas, public jetties, courtesy moorings, foreshore parks and shopping precincts. The establishment of the Mandurah Ocean Marina with its waterfront retail, cafes and restaurants represents one form of a popular boating destination. Others would include isolated moorings, foreshore picnic areas, shopping areas, upriver restaurants and parkland reserves.

It is evident that more could be done to promote and provide these types of facilities in the Peel region. The City of Mandurah's *Foreshore Focus 2020 Vision* recognises the opportunity to improve short stay and destination facilities near the town's centre but there are many other areas within the Peel's waterways that should also be considered and planned.

Houseboats and overnight facilities

In 1996 the Waters and Rivers Commission conducted a houseboat study within the Peel Inlet, including the Mandurah Estuary, Harvey Estuary and the Murray and Serpentine Rivers¹. The Study was conducted as a result of increased numbers of permanent and holidaying houseboats using the waterways of the Peel region. The Study identified a need for strategic planning of this activity in order to properly cater for and control these boats. The study recognised a shortage of temporary mooring facilities for houseboats at various destinations throughout the area and identified several sites suitable for a variety of moorings.

There are currently three hire and drive houseboat operators functioning in the Peel region. These are:

- Dolphin Houseboat Hire: situated in the Mandurah Ocean Marina on Dolphin Pool (has eight houseboats, with licences for two more);
- Murray River Houseboats: located opposite the Ravenswood Hotel, Pinjarra Road, Ravenswood (has three houseboats with licences for eight more);
- Pt Bouvard Houseboat Hire: located at the Port Bouvard Marina (has 16 houseboats, with licences for ten more).

There are approximately a further 46 (generally smaller) private houseboats operating within the Peel region². Requirements of live-on-board boats include berthing, moorings at strategic locations within the waterway, refuelling and sullage pump out facilities.

Current locations/destinations that are discouraged/excluded from visiting by the houseboat operators are:

- the Serpentine River;
- all canal systems except for the main canal in Port Mandurah;
- the main entrance into Wharf Cove;

¹ Houseboat Study – PIMA Region, Waters and Rivers Commission, September 1996

² Houseboat Study – PIMA Region, Waters and Rivers Commission, September 1996

- overnight mooring in Wharf Cove (now limited to four hours);
- visiting the Mandurah town centre (unless there are very favourable weather conditions); and
- larger boats are discouraged from proceeding further than Ravenswood Sanctuary up the Murray River.

7.5.2 Future

Discussions with houseboat operators¹ have identified their desire for more short stay moorings, mainly in the Murray River to provide overnight destinations for houseboats and potentially other larger private boats. Map 4 shows sites under consideration for short stay houseboat moorings.

A number of short stay destinations have been identified by houseboat operators. Many of these locations are also of benefit to recreational boating in general. Their suggested locations are listed below.

1. Boundary Island, which is a popular and safe haven for all boats could have additional short stay moorings installed.
2. Up-river from Coopers Mill, before the end of Culeenup Island could be suitable for the installation of mooring poles.
3. The jetty in front of Tathams (Strain Glen) would be ideal for larger boats, however there is currently a four hour mooring limit and the jetty can only accommodate boats up to five metres in length. Removing the mooring limit and upgrading the jetty would allow larger boats to moor overnight and provide direct access to public toilets, playground, BBQ and picnic area, and the delicatessen at Tathams Caravan Park.
4. Pelican's Delicatessen. The jetties have recently been refurbished and better cater for short stay visitors including houseboats.
5. The foreshore area at the River Resort could be significantly upgraded, with construction of a jetty across the front of the restaurant with room for five to six boats. This area is well protected and sheltered, suitable for people to disembark and has no noise implications for nearby residents.
6. Up-river, (Murray) downstream of the new Perth-Bunbury Highway Bridge, there are several potential mooring sites on both sides of the river that would have no noise implications.
7. Up-river, (Murray) upstream of the new Perth-Bunbury Highway Bridge, there is a location where the river widens. This area is safe from wind movements, has no noise implications and would be suitable for mooring poles.
8. The area just prior to the Ravenswood Bridge, on the northern side, would also be suitable for some mooring poles.
9. Beside the Murray River Houseboat pens, both up-river and down-river. The poles are in need of maintenance and would also be a good position for extra moorings of all types of boats, as there is public open space/car parking/public toilets, and easy access to the Ravenswood Hotel and delicatessen.

Other possible sites for short stay moorings include:

- Several spots up-river towards Pinjarra which could have poles for overnight mooring. These are in areas where the river widens, there are some beach landings and tranquil, quiet areas. Poles for mooring would protect the fragile river edges; and
- Swing moorings in front of "Lazy Days Caravan Park" in Lake Clifton.

¹ Peel Inlet Advisory Council meeting with Commercial Houseboat Hire Operators, 3 June 2009

Figure 14. Boundary Island (jetty and mooring area)



Recommendations	
28.	Establish and promote additional short stay moorings and berths at key destination points. (Short term)
29.	Establish short stay and overnight mooring facilities in the Murray River for use by recreational boats and houseboats, at appropriate locations. Install extra mooring facilities in the Murray River.
30.	Create a publication/s identifying short stay facilities and destination points within the Peel region to promote tourism and recreational opportunities. Such facilities would provide further boating alternatives to activities such as fishing and crabbing. (Short term)

7.6 Waterfront Developments

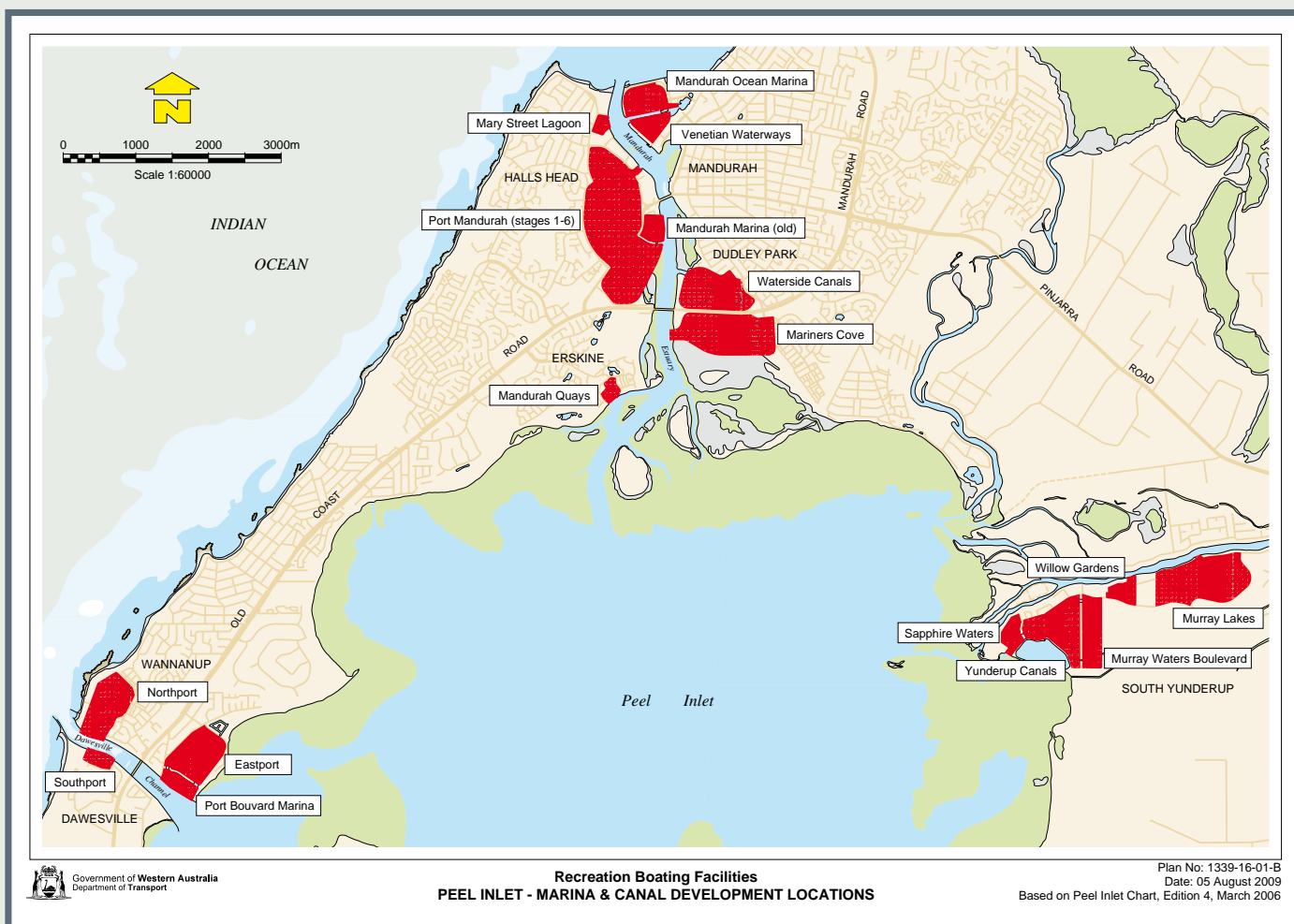
7.6.1 Existing

Mandurah is well known for its numerous and extensive canal estates and waterfront developments. Since the construction of the South Yunderup canal development in the 1970's there have been many further canal estates established, primarily in the City of Mandurah. These developments often include provision of mooring facilities for each lot and as such are able to address a significant portion of boating facility demand. It is to be recognised that the provision of waterfront lots with jetties inflates the numbers of larger boats in the Peel region.

It is currently estimated that there are just over 2,000 canal lots in the Peel region with mooring potential, and with the completion of proposed developments and development underway, a further 1,364 berths are considered possible.

The canal estate at Mariners Cove is nearing completion and Stage 5 of the Eastport canal development has recently been completed. These two developments are purported to be the last canal developments likely to be established in the Peel region in the foreseeable future.

Figure 15. Existing Peel Inlet marina and canal development locations.



7.6.2 Future

Many developments in the Peel region, including canal estates and waterfront developments, provide private boating facilities for their land owners. Whilst this is primarily a reflection of the demand for a waterfront lifestyle and an associated preparedness to pay premium land prices for such property, perhaps there is also a need to consider how such land developments, with close proximity to the waterway, of the Peel also contribute to public infrastructure.

The Peel region has one of the highest rates of boat ownership in WA currently running at 101.7 boats per 1,000 head of population. Land developments in this region will clearly add to boat numbers and associated facility demand. It would not be unreasonable to consider boating facilities as part of the range of public infrastructure to be provided by developments in the Peel region. This could be via the direct provision of public facilities within the development area or via a contribution to improvements to, or establishment of, new regional facilities.

It is noted that the Mariners Cove canal development has made provision for a two lane public boat launching facility and similarly, boating facilities have been indicated at Point Grey. In other areas, developers in the Shire of Murray have in the past indicated a willingness to support the establishment or improvement of public facilities.

7.7 Fuel / Servicing / Sullage

7.7.1 Fuel

All power boats require fuelling facilities and fuel requirements vary from petrol (both 2 and 4 stroke) to diesel. Trailer boats and/or their fuel tanks are highly portable and can be readily fuelled from automotive petrol stations. Larger boats, which are predominantly kept in pens on the water, require water based fuelling facilities. At present there are on-water fuelling facilities located at Mandurah Ocean Marina, Eastport Marina, and Pelican's Delicatessen which are available to the public.

Most spills are the result from careless refuelling or pumping oily bilge water overboard, either manually or via the operation of an automatic bilge. Small amounts of fuel or oil in the water column can be devastating to marine life and birds, while also having lasting effects on the environment.

7.7.2 Servicing

Boat maintenance may include the use and/or discharge to the waterway of antifouling and cleaning agents, hydrocarbons, paint, solvents, dust and other chemicals. When released into the river or estuarine systems, many of these substances have the potential to adversely affect aquatic marine life, water quality and public health¹.

The use of Tributyltin (TBT) for use as an antifouling compound has been banned in Australia on boats under 25 metres in length since 1991 (*Environmental Protection Regulations, 1987*)².

All larger non-trailerable boats require periodic maintenance and repair and this can often only be achieved by 'lifting' them from the water into a service area. The facilities and equipment required to do this are specialised and in the Peel region they only exist within the Mandurah Ocean Marina.

7.7.3 Sullage

Sullage is the term used for the liquid wastes stored onboard a boat. Untreated sewage that is discharged by boats can significantly degrade the water quality and can potentially introduce harmful bacteria and other pathogens into the water. Increasingly, recreational boats are now equipped with toilets and waste water management systems. Such systems need to be emptied periodically.

Most yacht clubs and private facilities have, or are moving towards having, sullage facilities provided for use by their members. However it needs to be recognised that increasing numbers of boats are permanently stored on swing moorings or in boat stacking facilities and may not have access to private sullage facilities. If there are no public sullage pump-out facilities provided there is a real risk of increased faecal pollution, particularly within the Murray and Serpentine Rivers.

Public pump out facilities should be encouraged within all marina developments, noting that facilities are available at the Mandurah Ocean Marina, Port Bouvard Marina and adjacent to the Pelicans Delicatessen site on the Murray River.

A boat owner survey³ revealed that 40 per cent of boat owners were not even aware that sullage pump-out facilities were available.

¹ Swan River Trust, 2008

² Swan River Trust, 2008

³ *Sullage Pump Out Facility on the Murray River* 2006 File No P115 Dept of Environment, Kwinana Peel

7.7.4 Future

For the future health of the waterways, increased use of sullage facilities will be necessary. The provision of additional publicly available sullage and fuelling facilities should be encouraged within marina developments. Public awareness of these facilities will need to be promoted.

Figure 16. Sullage Facility



Figure 17. Fuel Pumps



Recommendations	
31.	Improve public awareness and the availability of sullage facilities in the Peel region.
32.	Encourage any new marina developments to provide additional on-water public fuelling and sullage facilities. (Medium term)

7.8 Ancillary Boating Amenities

7.8.1 Existing

The provision of new and improved support infrastructure at major waterfront public access nodes will be required to meet the demands of increased population growth in the Peel region. Ancillary boating amenities can complement a boat launching facility and enhance the level of boating usage at the facility.

Many existing boat launching facilities lack a range of amenities. These include lighting, fish cleaning facilities, ablutions, rigging and wash down bays. The DoT's Recreational Boating Facilities Scheme (RBFS) can assist local governments to provide these amenities.

Projects eligible for funding under the RBFS include:

- Land-based items located at a boating facility, such as trailer parking, lighting, ablution blocks, waste facilities and fish cleaning tables;
- Signage regarding marine safety, fishing and other relevant information; and
- Infrastructure which enhances people's access to boating, such as floating jetties and universal access pontoons.

For more information on the RBFS refer to the DoT's website: www.transport.wa.gov.au/rbfs

Figure 18. Examples of a fish cleaning facility and an ablution facility



7.8.2 Future

Facility managers are encouraged to investigate opportunities to enhance their existing facilities via the provision of new and improved ancillary amenities. In particular the inclusion of universal access pontoons, improved parking areas and ablution facilities can greatly enhance the community's experience when using this public infrastructure.

Pontoons provide a safer and easier method for people to board a boat because the structure moves with the tide and limits the distance between the jetty and the floor of a boat. They allow improved access to and from boats, especially for people with limited mobility.

It has been observed that many boating facilities in the Peel region, in particular boat launching facilities are poorly signposted from major roads and this could be readily addressed by facility managers.

Figure 19. Universal access floating pontoon at Mary Street Lagoon boat ramp



Recommendations	
33.	Encourage the upgrade of existing boat launching facilities via the installation of related ancillary amenities and services such as universal access pontoons, improved parking and other facilities generally supported by the DoT's Recreational Boating Facilities Scheme. (Short term)
34.	Upgrade and standardise directional signage at boat launching facilities in the Peel region. (Short term)

8. Funding Options for New Boating Facilities

The options available to fund the development of new maritime infrastructure in Western Australia range from state, federal and local government funding, through to private enterprise and land development contributions. Joint funding opportunities also exist. In the Peel region the majority of boats in use are kept on trailers and require boat ramps for launching, whilst canal estates and marinas cater for the larger craft which are kept on water. Notably, most marina facilities are at capacity and boat ramps are heavily utilised on good boating days including by large numbers of non-local users.

8.1 Government Funding

Capital Works Funding for Major Facility Projects

In past decades the State Government (Department's of Transport, Marine and Harbours, and Public Works) planned, funded and delivered numerous small boat harbours along the Western Australian coast. The majority of these harbours were established to primarily assist local fishing and commercial marine industries and to generally benefit the local economies.

However, in recent years competition and tighter regulation has seen a sustained reduction in the number of fishing boats operating along the Western Australian coast. In contrast, recreational demands on existing boating facilities is increasing and today most new maritime facilities are more likely to be based around recreational and tourism demands. The recently developed Mandurah Ocean Marina with its tourism and residential emphasis reflects this trend.

With the changing focus of small harbours in Western Australia it is less likely that state governments will be inclined to be the sole investor in major developments that are predominantly recreationally focussed, and that might otherwise be commercially attractive to the private sector. Arrangements that include a mix of public / private funding may provide one model for the delivery of major new initiatives.

The Recreational Boating Facilities Scheme

The Recreational Boating Facilities Scheme (RBFS) is a State Government grants program that is administered by the DoT to provide improved recreational boating infrastructure through joint funding arrangements. The scheme is funded from recreational boat registration fees, and provides up to 75 per cent funding to local government authorities, state government departments, and statutory authorities towards public maritime facility development projects and planning studies which benefit recreational boat users. There is one funding round per financial year.

The RBFS aims to fund projects that:

- Improve recreational boating access to navigable waters;
- Enhance the safety of recreational boating infrastructure;
- Ensure that the environmental impact of recreational boating facilities is minimal;
- Provide new and upgraded recreational boating infrastructure; and
- Ensure consultation with recreational boating organisations.

Since its inception in 1998 the scheme has enabled significant improvements to recreational boating facilities with a total of \$11.1 million granted to 225 projects throughout Western Australia, from Wyndham in the north to Esperance in the south. Both the City of Mandurah and the Shire of Murray have been active participants of the RBFS with many new and improved facilities delivered with RBFS funds.

Local Government

Local governments are able to fund and develop new recreational boating facilities and may seek State and federal funding support, and / or draw on rate revenues or establish partnership or funding contributions from private developers. Increasingly, the costs to establish new facilities such as boat launching facilities are becoming prohibitively expensive and the majority of new local government projects relate to enhancements at existing facilities. However, local governments in the Peel region are well placed to pursue new and improved facilities via developer contributions and facility inclusions.

8.2 Private Sector Projects

Private sector developments can deliver significant community benefit by including or contributing to recreational boating facilities at their site or in the vicinity. Clearly, in the Peel region the significant numbers of canal estates are able to address a large portion of community demand for on water storage facilities; however, these developments often provide little in the form of public amenity. Given that the Peel region has one of the highest rates of boat ownership in Australia (101.7 boats per 1,000 head of population¹) it is reasonable to require land developments in the Peel region to contribute towards community boating infrastructure. Accordingly, the Mariners Cove and Waterside Canals in Mandurah have included a public boat launching facility within their developed land. Alternatively, the Port Coogee development closer to Perth provided funding towards new public boat ramps at the nearby Woodman Point.

Another aspect often raised in relation to private development is the alienation of sections of shorelines that were once public open space. Suitable locations for boating facilities on river and ocean shores are rare and where private developments are proposed in these locations they should consider providing public boating access and facilities.

The establishment of boat launching facilities has typically remained a responsibility of State and local governments. It is noteworthy that 93% of the Peel region's registered recreational boats are kept on trailers and require boat launching facilities. As these facilities require considerable land for trailer parking they are rarely popular inclusions within private developments.

Recommendation	
35.	Encourage land developers in the Peel region to provide new or improved public boating infrastructure within their development or contribute to the provision of public facilities nearby. (Short term)

¹ Australian Bureau of Statistics Estimated Resident Population figures from Census Rebasing (1996, 2001 and 2006), 1990 figures from 3311.5 (published in 1992).

9. Contacts and Sources of Further Information

The DoT's maritime operations are predominantly located in Fremantle. The DoT performs a broad range of maritime functions including the provision of funding, advice and services across Western Australia.

Visit www.transport.wa.gov.au for detailed information, including:

Marine Safety	
Regulations	www.transport.wa.gov.au/imate/19087.asp
Peel and Harvey Nautical Charts	Information: www.transport.wa.gov.au/imate/19100.asp Email: chart.sales@transport.wa.gov.au Telephone: 08 9216 8234
Mandurah Boating Guide	Guide: www.transport.wa.gov.au/imate/19128.asp Brochure: www.transport.wa.gov.au/mediaFiles/mar_rb_Mandurah-2009.pdf
Coastal Infrastructure Business Unit	
Jetty Licensing	Contact: Maritime Licensing Officer Information: www.transport.wa.gov.au/imate/19430.asp Email: CoastalFacilities@transport.wa.gov.au Telephone: 08 9216 8877
Facility design and development	Contact: Administration Email: NewCoastalAssets@transport.wa.gov.au Telephone: 08 9216 8875
The Recreational Boating Facilities Scheme:	Contact: Project Officer, RBFS Information: www.transport.wa.gov.au/rbfs Email: RBFS@transport.wa.gov.au Telephone: 08 9216 8917
Emergency Contacts: Report an incident / accident / complaint	Email: marine.safety@transport.wa.gov.au Telephone: 08 9431 1,000 (8am – 4pm - seven days) After hours: (Water Police) 08 9442 8600 Email: marine.pollution@transport.wa.gov.au
Report a spill	Telephone: 08 9480 9924

Appendices

Appendix 1: 1996 Study recommendations

Appendix 2: Boat registration projections 1990 - 2031

Appendix 3: Population projections 1990 - 2031

Appendix 4: Existing Peel region pens and moorings

Appendix 5: Boats 0 – 7.5 metres - Projections 2009 – 2031

Appendix 6: Boats > 7.5 metres - Projections 2009 - 2031

Appendix 7: Ramp level definitions

Maps

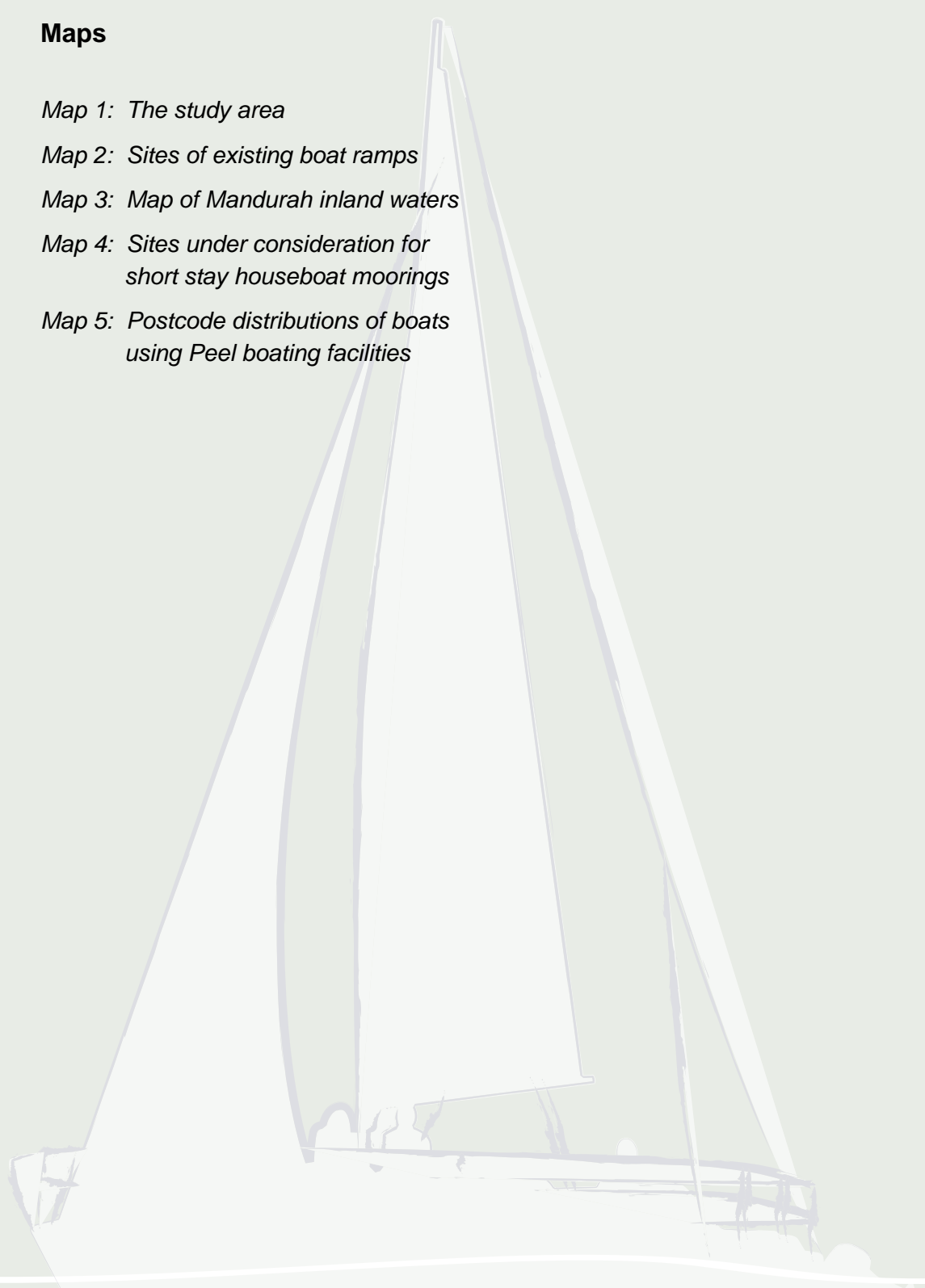
Map 1: The study area

Map 2: Sites of existing boat ramps

Map 3: Map of Mandurah inland waters

*Map 4: Sites under consideration for
short stay houseboat moorings*

*Map 5: Postcode distributions of boats
using Peel boating facilities*



Appendix 1. 1996 Study Recommendations

These recommendations have been selected from the *Boating Facilities Study for the Peel Region* Dept of Transport Report 386/96 All sites referred to are identified on Map 2. Note: the Peel Inlet Management Authority has been replaced by the Peel Inlet Management Council. Description of the levels referred to in the table below can be found in Appendix 7.

	Recommendation 1996	Action since 1996
1.	Ocean beach launching facilities (Level 2 boating facility) be retained at Melros Beach Road (BR11), Yeedong Road (BR10) and Spinaway Parade (BR9).	Spinaway Parade now closed. Melros and Yeedong are still operational.
2.	The public boat ramp in the Serpentine River at Lakes Road (BR1) be closed.	Closed.
3.	The ocean boat launching facility (Level 2 Boating Facility) at Halls Head Parade (BR8) be closed once beach launching ramps at Mandurah Ocean Marina (Level 6 Boating facility, BR5) have been established.	Halls Head beach launching facility has now been closed.
4.	The professional fisherman's boat launching facility in Estuary Road, Leura Street (BR16) should be closed.	Unchanged.
5.	That local area boat launching ramps be upgraded to a Level 3 boating facility. <ul style="list-style-type: none"> Birchley Road (BR3), Waterside Drive (BR7), Parkridge (BR15), Wharf Cove (BR20), Rivergum Esplanade (BR21), and Culeenup Road (BR22). 	These facilities have all been upgraded to Level 3 boating facilities, with the exception of Parkridge, which is a Level 4 boating facility.
6.	The public boating facility at Olive Road (BR13) be closed.	Not closed by 2009. The recommendation is to retain only for canoe launching subject to acceptable traffic and parking control measures being put in place.
7.	A new local boat-launching ramp (Level 3 Boating Facility) be constructed at Creery Wetlands (Mariners Cove) as a condition of sub-division, should that canal development proceed.	The canal development is proceeding; the ramp is under construction.
8.	Regional boat launching ramps be provided at Estuary Road (Florida) and Eastport Marina (BR17).	Both constructed.
9.	New district boat launching ramps (Level 4 Boating Facility) be constructed at Leisure Way (Mandurah) and Birch Way (BR26).	Leisure Way has not been constructed.

10.	<p>Level 4 Boating Facility launching ramps should be constructed at:</p> <ul style="list-style-type: none"> ▪ Redcliffe Road (BR2), ▪ Nairn Road (BR4), ▪ Novara (BR12), ▪ Mary Street Lagoon (BR6), ▪ Herron Point Road (BR25), ▪ Forrest Street (BR18), ▪ Ravenswood Road (BR19), ▪ Warma Way (BR24), and ▪ Riverside Drive (BR23). 	<p>These facilities have been improved to the following standards:</p> <p>Level 3</p> <p>Level 4</p> <p>Level 5</p> <p>Level 5</p> <p>Level 2</p> <p>Level 3</p> <p>Level 3</p> <p>Level 4</p> <p>Level 4</p>
11.	New regional boat launching ramps (Level 5 Boating Facility) be constructed at Point Grey and Tonkin Drive (Furnissdale).	Point Grey is at the planing stage. Tonkin Drive has had no action.
12.	A boat harbour (Level 6 Boating Facility) be constructed at Dolphin Pool (Mandurah).	Constructed (Level 6).
13.	The construction of new private jetties in the Peel inlet, Harvey Estuary, Dawesville Channel and the Peel Inlet Entrance Channel no longer be permitted.	Partially implemented.
14.	<p>For live-in on-board boats including houseboats,</p> <ul style="list-style-type: none"> • Berthing should be determined on the basis of available services including landside ablutions, water, power and sullage pump out facilities on a commercial basis. • Mooring is restricted to declared mooring areas. 	Partially implemented.
15.	Subject to land use planning and requirements, facilities suitable for shallow draft boats (power and sail), both commercial and private, be established in the Harvey Estuary between the Dawesville Channel and Crocos Place in association with related leisure activities currently undertaken in the area.	Partially Implemented.
16.	The City of Mandurah commence negotiations with interested parties for a public jetty to be located immediately upstream of the Old Traffic Bridge on the western side of the Peel Inlet entrance channel.	For City of Mandurah to provide comment.
17.	On-going development of the canoe club at Ravenswood be supported.	On-going.

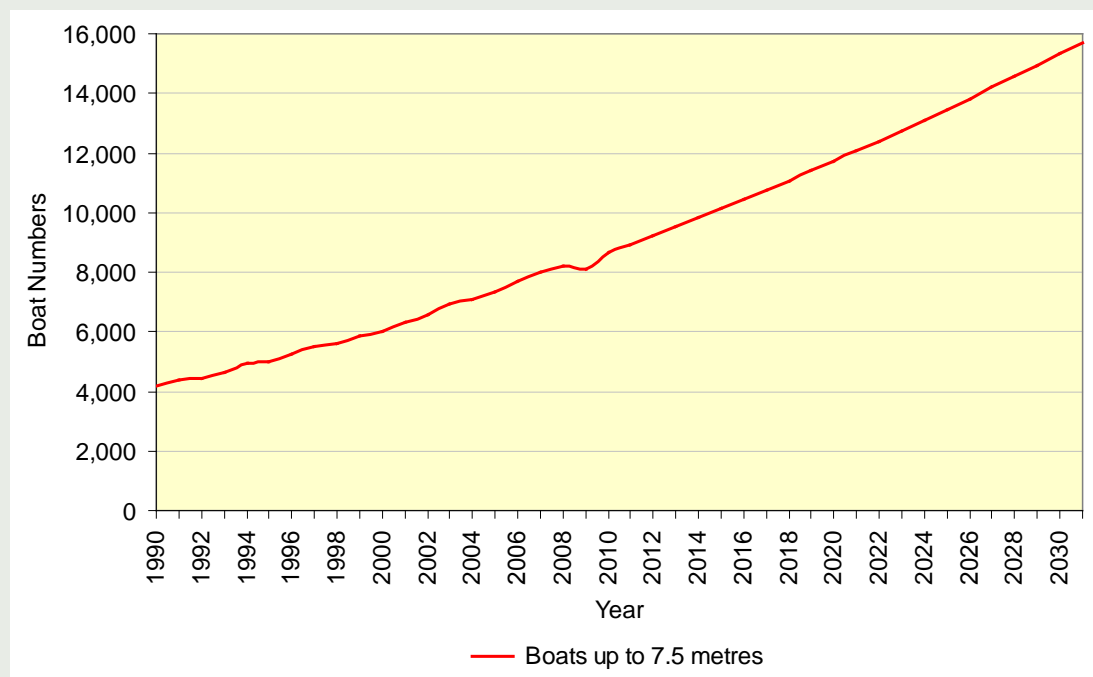
18.	<p>The Mandurah Volunteer Sea Search and Rescue Group:</p> <ul style="list-style-type: none"> • Continue be supported in seeking to achieve its objective of providing high quality sea search and rescue services, including boating education, for residents and visitors to the Peel region. • Be allowed to establish an annex in the Harvey Estuary adjacent to the Dawesville Channel southern breakwater in due course subject to agreed land use planning requirements. • Be the controlling volunteer sea Search and rescue organisation in the Peel region, conditional upon the group working in close association with the Police Department and other organisations including the Department of Transport. • Liaise with the WA Police Department, the Department of Transport and commercial boating operators in the formulation of the Peel Region Counter Disaster Plan. • Be renamed the Peel region Sea Search and Rescue Group in recognition of its role in marine safety throughout the Peel region. 	Mostly Implemented.
19.	<p>An action plan be adopted to improve boating behaviour in the Peel region, particularly in the Murray and Serpentine Rivers and the Yunderup Canals during holiday periods. The action plan should feature:</p> <ul style="list-style-type: none"> • An increased presence on the waters of agencies having control over boating activities during holiday periods. • Education programs aimed at lifting the awareness of skippers of boats as to their responsibilities. • Relevant and prominent signage aimed at specific user groups. • The introduction of a licensing system for skippers of all boats. • Co-agency agreements enabling agencies other than the Department of Transport to take action in respect to boating behaviour should the need arise. 	<p>Under Review.</p> <p>A recreational skipper's licence is now mandatory.</p>

20.	<p>Management Issues</p> <ul style="list-style-type: none"> • Approvals for access to the waterways in the Peel-Harvey Estuarine System for all purposes to be managed by each relevant Local Government in consultation with the Water and Rivers Commission (Peel Inlet Management Authority). • The City of Mandurah and the Shire of Murray explore with the Department of Transport the possibility of establishing a memorandum of understanding for the ongoing management of jetties, including licensing, in the Peel region. A joint Working Party, representing the agencies involved and including the Waters and Rivers Commission (Peel Inlet Management Authority) be established to progress this issue. • A Working Group, representing the City of Mandurah, the Shire of Murray, the Waters and Rivers Commission (Peel Inlet Advisory Committee) and the Department of Transport be established to define a number of declared mooring areas in the Peel-Harvey Estuarine System thereby enabling the mooring of boats to be controlled throughout the Peel region. • This report to be adopted by the City of Mandurah, the Shire of Murray, the Waters and Rivers Commission (Peel Inlet Management Authority) as a reference or working document, to be used when addressing proposals for new development in the Peel region. • The City of Mandurah and the Shire of Murray prepare detailed designs of the recommended boating facility upgrade program. • Upgrading works be progressively carried out to all boating facilities in the Peel region in accordance with the recommended preliminary schedule of upgrading works detailed in this report, as finances allow. • This report to be reviewed within a period of five years. 	<p>These issues are under consideration as a part of the Peel Regional Park Plan.</p>
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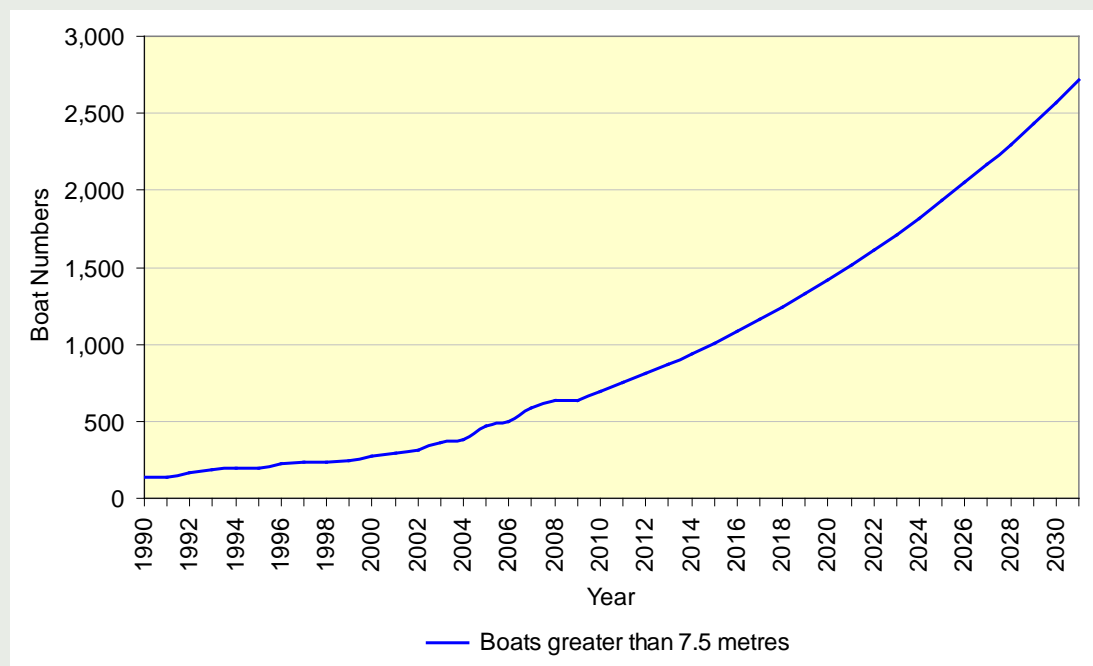
Appendix 2. Boat Registration Projections 1990 - 2031

Year	Number of Boats			Population	Boats per 1,000		
	0 - 7.5m	> 7.5m	Total		0 - 7.5m	> 7.5m	Total
1990	4,153	139	4,292	34,937	118.9	4.0	122.9
1991	4,359	137	4,496	41,030	106.2	3.3	109.5
1992	4,410	162	4,572	43,401	101.6	3.7	105.3
1993	4,614	182	4,796	46,577	99.1	3.9	103.0
1994	4,941	200	5,141	48,288	102.3	4.1	106.4
1995	4,995	198	5,193	50,656	98.6	3.9	102.5
1996	5,257	224	5,481	53,164	98.9	4.2	103.1
1997	5,486	235	5,721	55,458	98.9	4.2	103.1
1998	5,592	237	5,829	57,506	97.2	4.1	101.3
1999	5,872	243	6,115	58,818	99.8	4.1	103.9
2000	5,998	272	6,270	61,139	98.1	4.4	102.5
2001	6,333	289	6,622	63,276	100.1	4.6	104.7
2002	6,594	312	6,906	64,290	102.6	4.9	107.5
2003	6,933	358	7,291	67,052	103.4	5.3	108.7
2004	7,066	379	7,445	70,345	100.4	5.4	105.8
2005	7,322	466	7,788	73,004	100.3	6.4	106.7
2006	7,683	494	8,177	75,561	101.7	6.5	108.2
2007	7,997	584	8,581	78,375	102.0	7.5	109.5
2008	8,194	638	8,832	82,426	99.4	7.7	107.1
2009	8,099	634	8,733	85,856	94.3	7.4	101.7
2010	8,655	692	9,347	88,556	97.7	7.8	105.5
2011	8,938	749	9,687	91,256	97.9	8.2	106.1
2012	9,227	809	10,036	94,156	98.0	8.6	106.6
2013	9,520	872	10,392	97,156	98.0	9.0	107.0
2014	9,819	939	10,758	100,156	98.0	9.4	107.4
2015	10,124	1,010	11,134	103,156	98.1	9.8	107.9
2016	10,434	1,084	11,518	106,256	98.2	10.2	108.4
2017	10,749	1,162	11,911	109,156	98.5	10.6	109.1
2018	11,069	1,243	12,312	112,056	98.8	11.1	109.9
2019	11,395	1,328	12,723	115,056	99.0	11.5	110.5
2020	11,726	1,418	13,144	118,156	99.2	12.0	111.2
2021	12,062	1,512	13,574	121,456	99.3	12.4	111.7
2022	12,404	1,610	14,014	124,956	99.3	12.9	112.2
2023	12,751	1,712	14,463	128,656	99.1	13.3	112.4
2024	13,103	1,819	14,922	132,156	99.1	13.8	112.9
2025	13,461	1,931	15,392	135,856	99.1	14.2	113.3
2026	13,824	2,049	15,873	139,056	99.4	14.7	114.1
2027	14,192	2,171	16,363	142,256	99.8	15.3	115.1
2028	14,566	2,299	16,865	145,056	100.4	15.8	116.2
2029	14,945	2,433	17,378	147,556	101.3	16.5	117.8
2030	15,330	2,573	17,903	150,156	102.1	17.1	119.2
2031	15,719	2,719	18,438	152,456	103.1	17.8	120.9

Graph 2. Peel boat registration projections to 2031 (boats up to 7.5 metres)



Graph 3. Peel boat registration projections to 2031 (boats > 7.5 metres)



Appendix 3. Population Projections 1990 - 2031

Year	Mandurah	Murray	Waroona	Total
1990	24,399	7,821	2,717	34,937
1991	29,223	8,797	3,010	41,030
1992	31,397	8,947	3,057	43,401
1993	34,168	9,235	3,174	46,577
1994	35,639	9,423	3,226	48,288
1995	37,647	9,705	3,304	50,656
1996	40,460	9,510	3,194	53,164
1997	42,423	9,724	3,311	55,458
1998	44,131	9,993	3,382	57,506
1999	45,045	10,335	3,438	58,818
2000	47,023	10,616	3,500	61,139
2001	48,877	10,875	3,524	63,276
2002	49,574	11,211	3,505	64,290
2003	51,905	11,657	3,490	67,052
2004	54,841	11,969	3,535	70,345
2005	57,062	12,345	3,597	73,004
2006	59,288	12,629	3,644	75,561
2007	61,624	13,037	3,714	78,375
2008	64,787	13,825	3,814	82,426
2009	68,450	13,706	3,700	85,856
2010	70,850	14,006	3,700	88,556
2011	73,250	14,306	3,700	91,256
2012	75,650	14,806	3,700	94,156
2013	78,050	15,406	3,700	97,156
2014	80,350	16,006	3,800	100,156
2015	82,650	16,706	3,800	103,156
2016	84,950	17,506	3,800	106,256
2017	87,050	18,306	3,800	109,156
2018	89,050	19,206	3,800	112,056
2019	90,950	20,206	3,900	115,056
2020	92,850	21,406	3,900	118,156
2021	94,850	22,706	3,900	121,456
2022	96,750	24,306	3,900	124,956
2023	98,750	26,006	3,900	128,656
2024	100,550	27,706	3,900	132,156
2025	102,450	29,506	3,900	135,856
2026	104,050	31,106	3,900	139,056
2027	105,650	32,706	3,900	142,256
2028	107,050	34,106	3,900	145,056
2029	108,250	35,406	3,900	147,556
2030	109,450	36,806	3,900	150,156
2031	110,450	38,106	3,900	152,456

Appendix 4. Existing Peel Region Pens and Moorings

Name of Development	Number of Existing Pens	Number of Residential Jetties	Number of Potential Mooring Sites	Swing Moorings	
				Star Picket	Buoy or Pole
Port Mandurah Stages 1-6		541	298		
Mandurah Marina (old)		46	19		
Venetian Waterways		25	55		
Waterside Canals		292	51		
Mariners Cove Canal		163	278		
Murray Waters Boulevard		106			
Northport Canals		222	58		
Eastport Canals		122	303		
Southport Canals			50		
Mandurah Quays Canals		80			
Mandurah Ocean Marina	568				
Mary Street Lagoon	58		20		
Port Bouvard Marina	150				
South Yunderup Canals		180	102		
Murray Lakes Canals		205	77		
Willow Gardens		45	12		
Sapphire Waters		5	41		
Water Edge Caravan Park				71	9
Point Repose - South					9
Point Repose - North				12	5
Estuary Road					2
Birchmont - Harvey Estuary					1
Point Morfitt - North					3
Fernwood Road					4
Chapman Road					1
Crocos Place - South					67
Crocos Place - North					3
Dawesville Channel - South					3
Dawesville Channel - South					1
Owen Avenue - South					1
Owen Avenue - North					1
Halls Head					7
Mandurah Ocean Marina					2
Soldiers Cove					8
Soldiers Cove					1
Ronlyn Road					1
Culeenup Road					3
Strain Glen					14
Tathams Caravan Park				5	
Murray River Caravan Park				1	
Pelican Road					2
Redcliffe Road					1
TOTAL	776	2,032	1,364	89	149

Appendix 5. Boats 0 – 7.5 metres - Projections 2009 - 2031

Table 10. City of Mandurah boats 0 – 7.5 metres projections to 2031

Year	Boats 0 - 7.5 metres	Population	Boats per 1,000 Population	Actual increase	Boats in use on a good day *		No of lanes required
					Local boats	Non local boats	
2009	5,642	68,450	82.4				
2010	6,103	70,850	86.1	461	23	23	1.2
2011	6,289	73,250	85.9	647	32	32	1.6
2012	6,478	75,650	85.6	836	42	42	2.1
2013	6,670	78,050	85.5	1,028	51	51	2.6
2014	6,865	80,350	85.4	1,223	61	61	3.1
2015	7,062	82,650	85.4	1,420	71	71	3.6
2016	7,263	84,950	85.5	1,621	81	81	4.1
2017	7,466	87,050	85.8	1,824	91	91	4.6
2018	7,672	89,050	86.2	2,030	102	102	5.1
2019	7,880	90,950	86.6	2,238	112	112	5.6
2020	8,092	92,850	87.2	2,450	123	123	6.1
2021	8,306	94,850	87.6	2,664	133	133	6.7
2022	8,523	96,750	88.1	2,881	144	144	7.2
2023	8,743	98,750	88.5	3,101	155	155	7.8
2024	8,966	100,550	89.2	3,324	166	166	8.3
2025	9,192	102,450	89.7	3,550	178	178	8.9
2026	9,420	104,050	90.5	3,778	189	189	9.4
2027	9,651	105,650	91.4	4,009	200	200	10.0
2028	9,885	107,050	92.3	4,243	212	212	10.6
2029	10,122	108,250	93.5	4,480	224	224	11.2
2030	10,362	109,450	94.7	4,720	236	236	11.8
2031	10,604	110,450	96.0	4,962	248	248	12.4

* An analysis of where trailer boats are coming from has revealed that under peak boating conditions approximately 50% of the boats being launched are non-local and only approximately 5% of local boats are likely to be in use.

No. of lanes required is based on 40 car/trailer parking spaces for each ramp lane at an urban facility with boat holding structures as specified in the Australian Standard Guidelines for the Design of Marinas.

Table 11. Shire of Murray boats 0 – 7.5 metres projections to 2031

Year	Boats 0 - 7.5 metres	Population	Boats per 1,000 Population		Boats in use on a good day *		No of lanes required
				Actual increase	Local boats	Non local boats	
2009	2,220	13,706	162.0				
2010	2,309	14,006	164.8	89	4	4	0.2
2011	2,398	14,306	167.6	178	9	9	0.4
2012	2,489	14,806	168.1	269	13	13	0.7
2013	2,582	15,406	167.6	362	18	18	0.9
2014	2,678	16,006	167.3	458	23	23	1.1
2015	2,777	16,706	166.2	557	28	28	1.4
2016	2,877	17,506	164.4	657	33	33	1.6
2017	2,980	18,306	162.8	760	38	38	1.9
2018	3,085	19,206	160.6	865	43	43	2.2
2019	3,193	20,206	158.0	973	49	49	2.4
2020	3,303	21,406	154.3	1,083	54	54	2.7
2021	3,415	22,706	150.4	1,195	60	60	3.0
2022	3,530	24,306	145.2	1,310	66	66	3.3
2023	3,647	26,006	140.2	1,427	71	71	3.6
2024	3,767	27,706	135.9	1,547	77	77	3.9
2025	3,888	29,506	131.8	1,668	83	83	4.2
2026	4,012	31,106	129.0	1,792	90	90	4.5
2027	4,139	32,706	126.5	1,919	96	96	4.8
2028	4,268	34,106	125.1	2,048	102	102	5.1
2029	4,399	35,406	124.2	2,179	109	109	5.4
2030	4,532	36,806	123.1	2,312	116	116	5.8
2031	4,668	38,106	122.5	2,448	122	122	6.1

* An analysis of where trailer boats are coming from has revealed that under peak boating conditions approximately 50% of the boats being launched are non-local and only approximately 5% of local boats are likely to be in use.

No. of lanes required is based on 40 car/trailer parking spaces for each ramp lane at an urban facility with boat holding structures as specified in the Australian Standard Guidelines for the Design of Marinas.



Table 12. Shire of Waroona boats 0 – 7.5 metres projections to 2031

Year	Boats 0 - 7.5 metres	Population	Boats per 1,000 Population	Actual increase	* Boats in use on a good day		No of lanes required
					Local boats	Non local boats	
2009	237	3,700	64.1				
2010	244	3,700	65.8	7	0	0	0.0
2011	251	3,700	68.0	14	1	1	0.0
2012	260	3,700	70.1	23	1	1	0.1
2013	268	3,700	72.4	31	2	2	0.1
2014	276	3,800	72.7	39	2	2	0.1
2015	285	3,800	75.0	48	2	2	0.1
2016	294	3,800	77.3	57	3	3	0.1
2017	303	3,800	79.6	66	3	3	0.2
2018	312	3,800	82.1	75	4	4	0.2
2019	321	3,900	82.3	84	4	4	0.2
2020	331	3,900	84.8	94	5	5	0.2
2021	340	3,900	87.3	103	5	5	0.3
2022	350	3,900	89.8	113	6	6	0.3
2023	360	3,900	92.4	123	6	6	0.3
2024	370	3,900	95.0	133	7	7	0.3
2025	381	3,900	97.6	144	7	7	0.4
2026	391	3,900	100.3	154	8	8	0.4
2027	402	3,900	103.1	165	8	8	0.4
2028	413	3,900	105.9	176	9	9	0.4
2029	424	3,900	108.7	187	9	9	0.5
2030	435	3,900	111.6	198	10	10	0.5
2031	447	3,900	114.6	210	11	11	0.5

* An analysis of where trailer boats are coming from has revealed that under peak boating conditions approximately 50% of the boats being launched are non-local and only approximately 5% of local boats are likely to be in use.

No. of lanes required is based on 40 car/trailer parking spaces for each ramp lane at an urban facility with boat holding structures as specified in the Australian Standard Guidelines for the Design of Marinas.

Appendix 6. Boats > 7.5 metres - Projections 2009 - 2031

Table 13. City of Mandurah boats > 7.5 metres projections to 2031

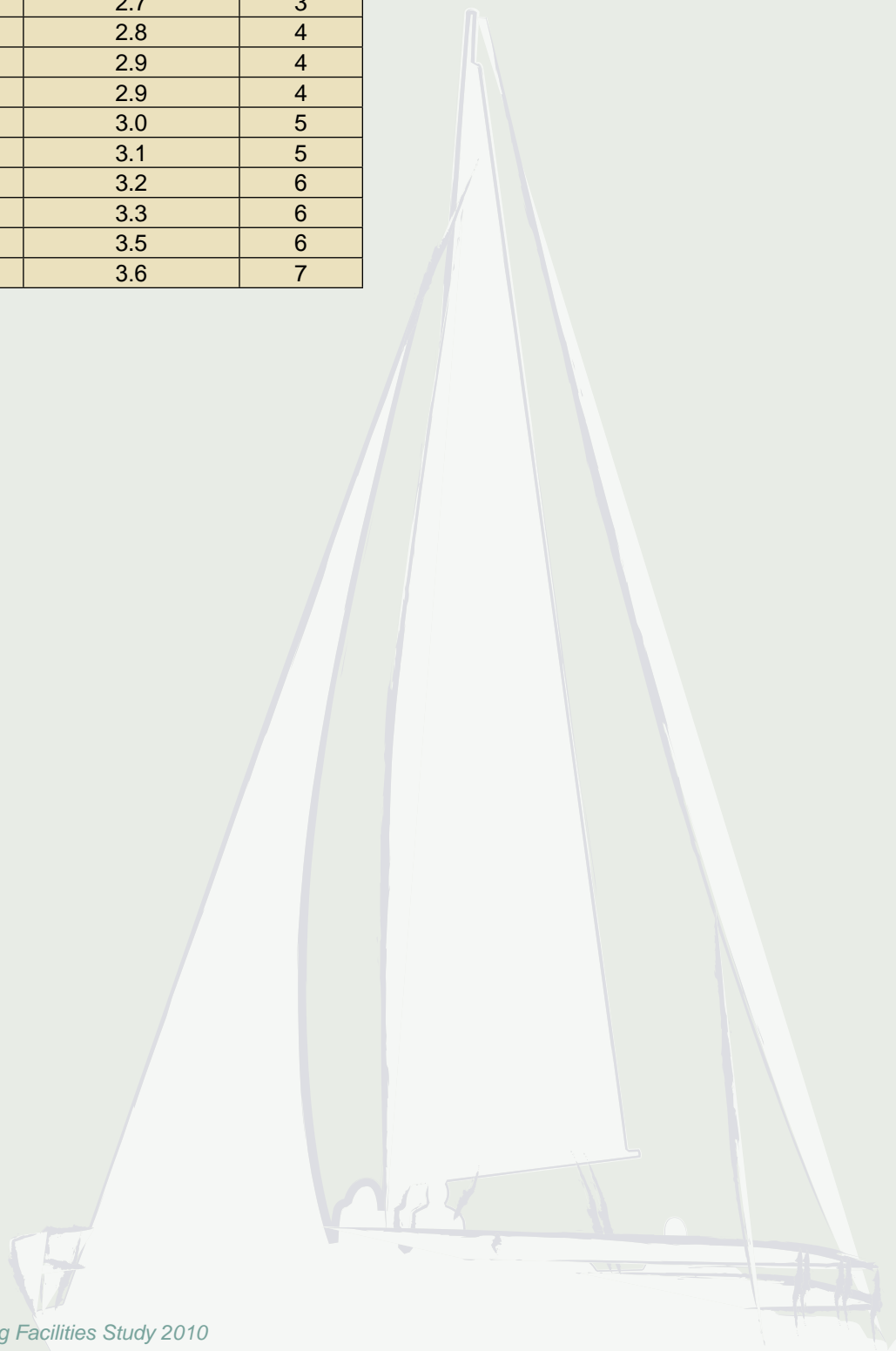
Year	Boats > 7.5 metres	Population	Boats per 1,000 Population	Actual increase
2009	456	68,450	6.7	
2010	532	70,850	7.5	76
2011	577	73,250	7.9	121
2012	624	75,650	8.2	168
2013	673	78,050	8.6	217
2014	724	80,350	9.0	268
2015	778	82,650	9.4	322
2016	834	84,950	9.8	378
2017	892	87,050	10.2	436
2018	953	89,050	10.7	497
2019	1,015	90,950	11.2	559
2020	1,081	92,850	11.6	625
2021	1,148	94,850	12.1	692
2022	1,217	96,750	12.6	761
2023	1,289	98,750	13.1	833
2024	1,363	100,550	13.6	907
2025	1,440	102,450	14.1	984
2026	1,518	104,050	14.6	1,062
2027	1,599	105,650	15.1	1,143
2028	1,683	107,050	15.7	1,227
2029	1,768	108,250	16.3	1,312
2030	1,856	109,450	17.0	1,400
2031	1,946	110,450	17.6	1,490

Table 14. Shire of Murray boats > 7.5 metres projections to 2031

Year	Boats > 7.5 metres	Population	Boats per 1,000 Population	Actual increase
2009	171	13,706	12.5	
2010	153	14,006	10.9	-18
2011	165	14,306	11.5	-6
2012	178	14,806	12.0	7
2013	192	15,406	12.5	21
2014	207	16,006	12.9	36
2015	224	16,706	13.4	53
2016	241	17,506	13.8	70
2017	261	18,306	14.2	90
2018	281	19,206	14.6	110
2019	304	20,206	15.0	133
2020	328	21,406	15.3	157
2021	354	22,706	15.6	183
2022	382	24,306	15.7	211
2023	412	26,006	15.8	241
2024	445	27,706	16.1	274
2025	480	29,506	16.3	309
2026	518	31,106	16.7	347
2027	559	32,706	17.1	388
2028	604	34,106	17.7	433
2029	652	35,406	18.4	481
2030	703	36,806	19.1	532
2031	759	38,106	19.9	588

Table 15. Shire of Waroona boats > 7.5 metres projections to 2031

Year	Boats > 7.5 metres	Population	Boats per 1,000 Population	Actual increase
2009	7	3,700	1.9	
2010	7	3,700	1.9	0
2011	7	3,700	2.0	0
2012	8	3,700	2.1	1
2013	8	3,700	2.1	1
2014	8	3,800	2.1	1
2015	8	3,800	2.2	1
2016	9	3,800	2.3	2
2017	9	3,800	2.3	2
2018	9	3,800	2.4	2
2019	9	3,900	2.4	2
2020	10	3,900	2.5	3
2021	10	3,900	2.6	3
2022	10	3,900	2.7	3
2023	11	3,900	2.8	4
2024	11	3,900	2.9	4
2025	11	3,900	2.9	4
2026	12	3,900	3.0	5
2027	12	3,900	3.1	5
2028	13	3,900	3.2	6
2029	13	3,900	3.3	6
2030	13	3,900	3.5	6
2031	14	3,900	3.6	7



Appendix 7. Ramp Level Definitions

Note: Some variations in facility standards are allowed throughout each category

Level 1 An effective and efficient sea search and rescue organisation.

Level 2 Minimal recreational boat-launching facilities with each facility providing:

- A restricted length of waterside (usually a beach) over which launching can take place as determined by environmental conditions
- Launching and retrieval of craft by a four-wheel drive vehicle
- Limited unsealed car parking
- Limited landscaped surrounding
- Marine safety signage
- Rubbish collection
- Occasional maintenance as determined by annual budget constraints

Level 3 Local boat-launching facilities with each facility providing:

- A single or two-lane ramp with a holding jetty for launching and retrieval of shallow draft craft by a two-wheel drive vehicle Note: it is generally cheaper to install two lanes initially rather than extend later.
- Limited sealed car parking with unsealed car parking as overflow (ref. Australian Standards AS3962-2001)
- Limited landscaped surroundings
- Marine safety signage
- Rubbish Collection
- Occasional maintenance as determined by annual budget constraints

Level 4 District boat-launching facilities with each facility providing:

- A two-lane ramp with a holding jetty for launching and retrieval of shallow draft craft by a two wheel-drive vehicle
- Limited sealed car parking with unsealed overflow (ref. Australian Standards AS3962-2001)
- Navigation aids
- Public toilets
- Landscaped surroundings
- Drinking water
- Barbeques
- Playground
- Shade Trees
- Appropriate signage with an architecturally designed shade enclosure
- Rubbish collection
- Regular maintenance as conditions arise

Level 5 Regional boat launching facilities accessible on the payment of the requisite fee, with each facility providing:

- A multiple number of lanes for launching and retrieval by a two-wheel drive vehicle
- Holding jetties to assist launching and retrieval for each lane
- Navigation aids
- Formal sealed car parking with unsealed car parking as overflow (ref. Australian Standards AS3962-2001)
- Public toilets
- Channel access for trailerable boats at all condition of tide
- Boat wash down facilities
- Lighting
- Security fencing
- Recreational shopping facilities within close proximity
- Landscaped surroundings
- Shade Trees
- Playground
- Appropriate signage with an architecturally designed shade enclosure
- Rubbish collection
- Regular maintenance on demand
- Appropriate planning in place to allow for the possible upgrade of the facility to boat harbour status at some time in the future

Level 6 A major boat harbour providing:

- Boat pens
- Club facilities
- Multiple ramp lanes for launching and retrieval by two-wheel drive vehicle
- Holding jetties to assist in launching and retrieval
- Formal sealed car parking (ref. Australian Standards AS3962-2001)
- Service jetty
- Boat repair facilities including one boat lifter in the region
- Boat refuelling facilities including diesel and petrol (two-stroke)
- Public toilets and showers
- Sullage pump out facilities
- Channel access for deep-keeled boats at all conditions of tide
- Boat wash down facilities
- Lighting
- Recreational shopping and tourist facilities within close proximity
- Landscaped surroundings
- Shade trees
- Playground
- Navigation aids
- Appropriate signage within an architecturally designed shade enclosure
- Rubbish collection
- Regular maintenance on demand
- Associated commercial and residential development



Department of Transport
Government of Western Australia

Plan No: MI 1338-08-02_C Date 05 Aug. 2009

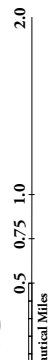
MAP 1



MANDURAH INLAND WATERS

NOT TO BE USED FOR NAVIGATION
For more detailed information,
Refer to the Department of Transport's Nautical Charts
Peel Inlet and Harvey Estuary WA 848

Bouvard WA 755
Cape Peaton to Dawsville WA 913
Government of Western Australia
Department of Transport



LEGEND

- 5 Knot Speed Area
- 8 Knot Speed Area
- 12 Knot Speed Area
- Boating Prohibited Area
- Water Ski Area
- Open water
- Shallow water
- Very shallow water
- Launching ramp
- Non-powered launching

Speed conversion chart	
knots	km/h
1	1.85
5	9.25
8	14.80
12	22.20

Radio frequencies	
Call sign	WMA 611
Mandurah Water Rescue	Ch. 16 & 73
VHF Radio Band	Ch. 27.88
Emergency	Ch. 27.91
Local	Ch. 27.96
Boat to boat	

Cardinal marks

Keep Northward flashes
uninterrupted flashes

RED
6 flashes in a group
Keep WEST of

GREEN
3 flashes in a group
Keep SOUTH of

WHITE
6 flashes + 1 long flash in a group

Basic rules of the waterways

Vessel Overtaking
Every overtaking vessel gives way (this includes sailing vessels)

Power Vessels Meeting Head On
Each vessel alters course to starboard

Power Meeting Sailing Vessel
Power gives way to sailing vessel except when sailing vessel is overtaking

Heading up river

Red Flashing Light
Keep this to Port

Green Flashing Light
Keep this to Starboard

Heading down river

Red Flashing Light
Keep this to Starboard

Green Flashing Light
Keep this to Port

Safe Water / Mid Channel Marks

Safe Water Mark
(in centre of channel)
Long white flashes

Diving flag

Any boat with divers (not snorkellers) operating from it must always display signals by day or night to inform other boat users. The daytime signal for divers is an International Code-Flag "X". The flag must be at least 750mm long and 600mm wide.

Divers operating without a vessel, for example from a jetty, must display the International Code-Flag "X". The flag must not be less than 300 mm in length and 200 mm in width. The flag may be displayed from a buoy. If displayed from a buoy, the flag must not be less than 300 mm in length and 200 mm in width. The flag must be clearly visible to all vessels operating in the vicinity.

International Code-Flag "X"

Water skiing

Water skiing is when a person(s) is being towed behind a vessel at a speed of 8 knots or more. It takes at least three people to go water skiing:

- a driver of at least 17 years of age;
- an observer of at least 14 years of age; and
- a skier who is being towed by the vessel.

A vessel taking-off with skiers shall give way to a vessel landing skiers.

CAUTION
Overhead powerlines exist at various locations over waterways on this guide.

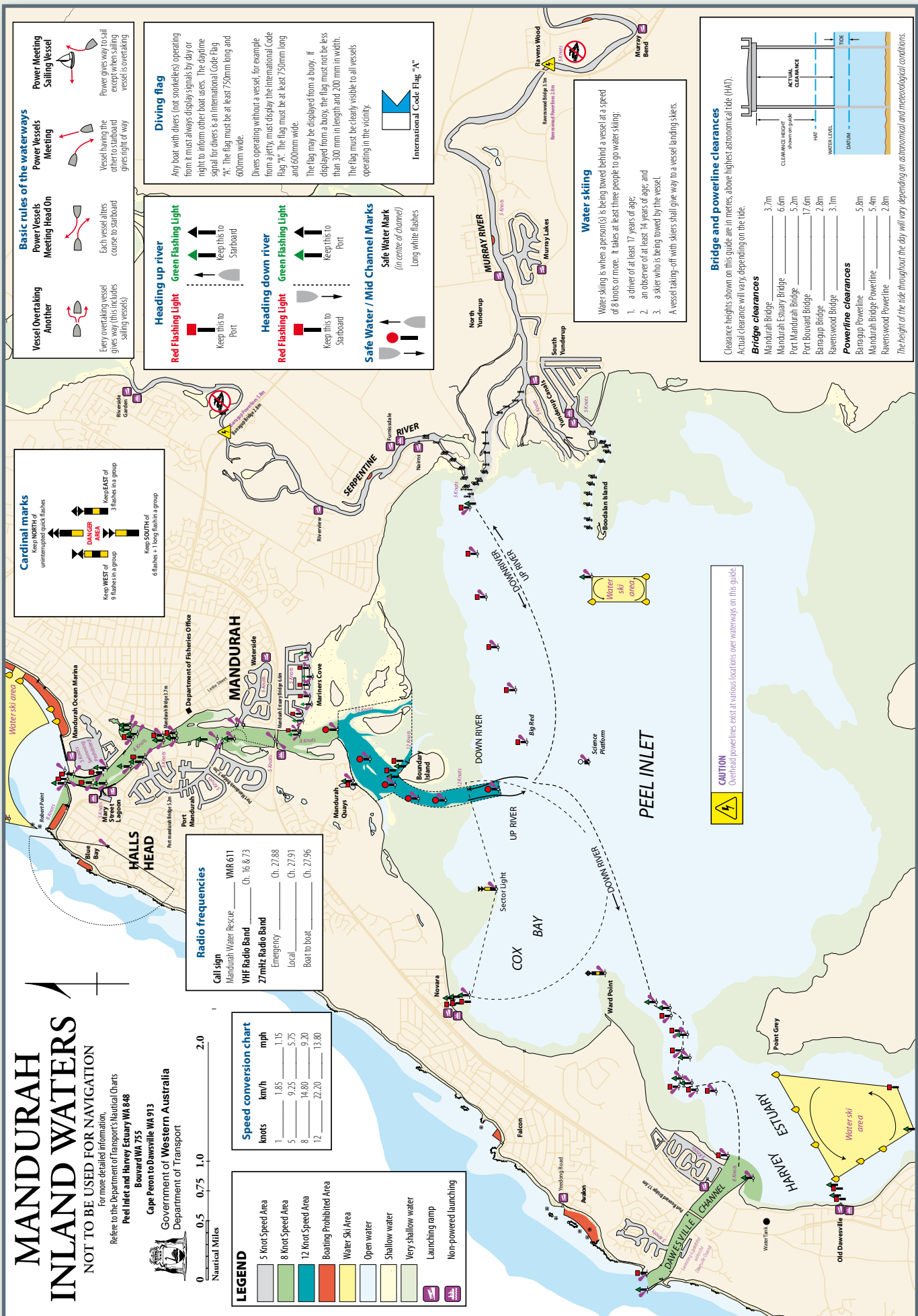
Bridge and powerline clearances

Clearance heights shown in this guide are in metres, above highest astronomical tide (HAT). Actual clearance will vary depending on the tide.

Bridge	Clearance
Mandurah Bridge	3.7m
Mandurah Esuary Bridge	6.6m
Port Mandurah Bridge	5.2m
Port Bourard Bridge	17.6m
Barraquup Bridge	2.8m
Ravenswood Bridge	3.1m

Powerline	Clearance
Barraquup Powerline	5.8m
Mandurah Bridge Powerline	5.4m
Ravenswood Powerline	2.8m

The height of the tide throughout the day will vary depending on astronomical and meteorological conditions.

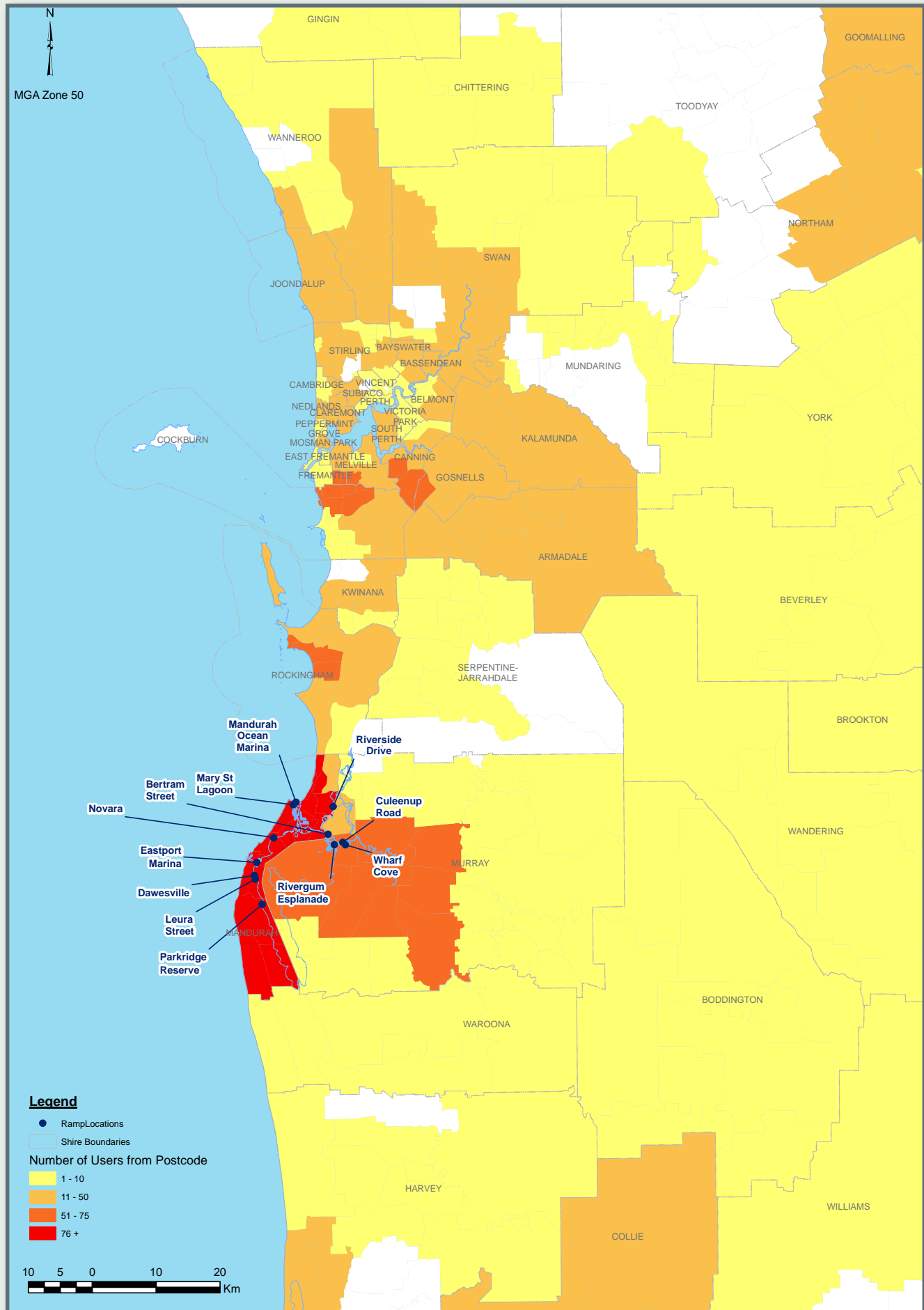


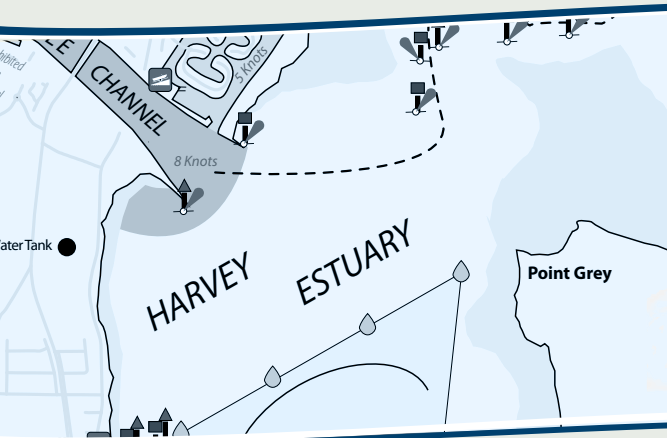


Map 5

Postcode distributions of boats using Peel boating facilities

Recreational Boating Facilities in the Peel Region
Postcode Locations of Boats using Peel Region Boat Ramps
Survey December 2008 – January 2009





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