



C7

VOLUME C: MIDDLE BANKS, MORETON BAY
Social Impact Assessment

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KEY FINDINGS

- This Chapter of the Draft EIS/MDP considers the potential direct, indirect or cumulative social impact of the sand extraction at Middle Banks associated with the NPR project on various nearby communities, tourism activities, recreational activities in Moreton Bay, commercial fishing operations, shipping and other commercial sand extraction activities.
- Social impact assessment is the analysis of social changes and impacts on community that are likely to occur as a result of a particular development, planning scheme or government policy decision. For the purposes of the NPR project, the social impact assessment has identified those potentially impacted, the social impacts likely to be experienced and methods to best manage any potential impacts identified.
- A number of consultative mechanisms were implemented which included discussions with industry bodies associated with commercial and recreational fishing, tourism operators with links in Moreton Bay and Moreton Island communities.
- No significant noise, visual or landscape impacts are expected to affect Moreton Island communities.
- Chapter C3: Coastal Processes explains that erosion occurring at Cowan Cowan on Moreton Island is part of a long term evolution of the shoreline and will not be influenced in any discernible way by dredging activities. Therefore, while erosion will continue to be of concern to residents on Moreton Island, the dredging activity will not have a direct connection with any associated social impacts.
- As outlined in Chapter C5, based on the premise that the dredging activity will be located away from areas generally used for commercial trawling and that impacts on seagrass are expected to be negligible, it is considered that the direct social impact on the commercial fishing industry will be negligible.
- The proposed dredging will have no identifiable impact on the tourism industry's use of Moreton Bay, with the NPR likely to contribute to industry growth.
- The proposed dredging will have no impact on existing sand extraction industry operations at Middle Banks.
- It is not considered likely that the proposed dredging will alter the experiences enjoyed by recreational fishers, either through general enjoyment of the Moreton Bay environment or through the availability of fish to catch.
- Impacts from dredging on water-based sports are expected to be minimal as Middle Banks is rarely used for activities such as swimming. Scuba diving sites are generally located closer to the shore and are excluded from marked shipping channels.
- Aside from appropriate safety zones, the dredge operation will not be an exclusive use of the Middle Banks area. Consequently, it is considered that the degree of social impact on tourism and recreational activities and access is negligible.
- There are no known projects that will act in a cumulative manner on the communities of interest associated with dredging of Middle Banks.

7.1 Introduction

This Chapter of the EIS/MDP considers the potential for direct, indirect or cumulative social impact from the proposed sand extraction at Middle Banks upon the following:

- Island settlements;
- Commercial fishing including trawling operations;
- Other commercial sand extraction activities;
- Recreational fishing;
- Diving;
- Tourism activities including whale watching and day trips around Moreton Bay;
- Island based tourist activities including camping, touring and water sports;
- Transport operators;
- Recreational boating/sailing;
- Commercial shipping; and
- River Users (in the context of the vessel approaching and departing the mooring facility at Luggage Point).

7.2 Proposed Development

A description of the NPR Project is contained within Chapter A4 of the EIS/MDP. In summary, dredge operations will involve three phases:

- Extraction of sand from Middle Banks (Moreton Bay) with a trailer suction hopper dredge (TSHD);
- Transportation of sand from Middle Banks to a designated mooring site, at Luggage Point in the Brisbane River, adjacent to the Brisbane Airport; and
- Delivering the sand to the NPR site by hydraulic placement via a dredge pipeline.

At Middle Banks, the dredge will operate over a 'footprint' which would be approximately 1 km wide by 6 km long. The footprint will be located in the north-eastern quadrant of Middle Banks, running along the western edge of the East Channel (East Channel separates Middle Banks from Moreton Island). The dredge will be a vessel of around 180 m in length which, when dredging, will travel at approximately 1 to 2 knots and will operate in long runs of between 3 km and 4 km.

Dredge operations will occur over a period of 12 – 18 months¹, 24 hours per day, on an approximate eight hour cycle:

- Filling the dredge hopper with sand at Middle Banks will take approximately 2 hours;
- Travelling from Middle Banks to the Brisbane River mouth (at approximately 10-15 knots) will take approximately 2 hours;
- Unloading the dredge hopper will take approximately 2 hours; and
- The return trip to Middle Banks will take approximately 2 hours.

Accordingly, the dredge is expected to be present at Middle Banks three times each day, for a period of two hours each time during the sand extraction phase of the project.

¹ Note that the overall time of the dredging operation is dependant on the size and hopper capacity of the dredge vessel that is contracted. For a large Trailer Suction Hopper Dredge the dredging activity can be completed in 12 months. A smaller dredge would take a longer period of time as it would need to travel to and from Middle Banks more times to obtain the required volume of material.

7.3 Methodology

7.3.1 Approach

There are many definitions of social impacts. Two definitions suitable to the present assessment are:

Significant events experienced by people as changes in one or all of the following:

- People's way of life – how they live, work, play and interact with one another on a day to day basis;
- Their culture – shared beliefs, customs and values;
- Their community – its cohesion, stability, character, services and facilities.

NSW Office of Social Policy (1995).

And

- By social impacts we mean the consequences to human populations of any public or private actions that alter the ways in which people live, work, play, relate to one another, organise to meet their needs and generally cope as members of society. The term also includes cultural impacts involving changes to the norms, values, and beliefs that guide and rationalise their cognition of themselves and their society.

The Interorganizational Committee on Principles and Guidelines for Social Impact Assessment (2003).

Social impact assessment is the analysis of social changes and impacts on community that are likely to occur as a result of a particular development, planning scheme, or government policy decision.

The social impact assessment has involved the following methodology:

1. **Scoping.** Identify potentially affected groups and individuals and their issues of concern and the nature of the likely impact – what might happen where and to whom?
2. **Profiling.** Describe the nature of the groups and individuals likely to be affected.
3. **Prediction.** What are the social impacts associated with the development, who is affected and to what extent.
4. **Assessment.** Are these impacts significant given the priorities, policies and programs of Government?
5. **Management, mitigation, monitoring and review.** How can the potential impacts of this development best be managed?
6. **Recommendations.** What recommended strategies and actions will produce the best outcomes for the groups or individuals potentially impacted by the development?

The scope of this Social Impact Assessment has been set by the EIS Guidelines issued for the project under the *Environment Protection and Biodiversity Conservation Act 1999*, Guidelines For An Environmental Impact Statement On The Proposed Parallel Runway At Brisbane Airport (August 2005).

The scope of the SIA, as identified in section 10.14 of the EIS Guidelines is as follows:

Address community impact issues arising from the proposal, including:

- A description of the key demographic characteristics of the South East Queensland region, including demographic trends;
- Impacts of runway construction and airport operation on regional and local communities including noise, traffic, air quality, amenity, demands on local services;
- Impacts of airport operations on regional and local communities including impacts on demographic characteristics due to redevelopment or changes in land values;
- Property acquisition requirements and processes;
- Impacts which may cause substantial change or disruption to the regional and local community in terms of loss of amenity, changes to lifestyle and everyday activities;
- Impacts on potential Native Title claimants; and
- Impacts on radio and television reception.

7.3.2 Significance Criteria

The significance of socio-economic impacts is a matter of judgement.

However, there is a need to assign a significance to this assessment so that any impacts can be considered in relation to the other environmental, engineering, social and economic impacts identified in association with the proposed development.

Table 7.3a defines significance criteria for assessing the environmental consequences of the proposal.

Table 7.3a: Significance Criteria: Social Impact Assessment.

Significance	Criteria: Social Impact
Major Adverse	Irreversible and significant negative change to current amenity, lifestyle and community activities and functioning.
High Adverse	Considerable adverse change to current amenity, lifestyle and everyday community activities with limited scope for mitigation.
Moderate Adverse	Noticeable adverse change to current amenity, lifestyle and everyday community activities, but with scope for some mitigation.
Minor Adverse	Localised or limited noticeable change to current amenity, lifestyle and everyday community activities, which can be largely mitigated. Some residual effects will still arise.
Negligible	Very little change in the current situation. No appreciable impact on local amenity, resident lifestyle and everyday community activities. Imperceptible changes to the amenity of nearby residences.
Minor Beneficial	Minor improvements to current amenity, lifestyle and everyday community activities.

7.4 Limitations and Assumptions

The following assumptions have been made in the study:

- The extent that Moreton Bay is used as a recreational resource has never been comprehensively assessed.
- The profile of the existing social environment is based primarily on 2001 data sourced from the Australian Bureau of Statistics 2001 Census of Population and Housing. Projections have been made of this data where possible based on an assumption of the continuation of social trends.

7.5 Baseline - Summary Description of the Social Environment

7.5.1 Introduction

This section summarises the social environment of the communities which may be directly or indirectly impacted by dredging activities. These investigations included the compilation of profiles of socio-economic information, social structure and conditions for these communities, as well as a description of their social infrastructure. The profile is based upon data provided by the Australian Bureau of Statistics (ABS) Censuses of Population and Housing for 2001 and 1996. It has been supplemented with other data where available.

Middle Banks is located approximately 4 km due west of Tangalooma Point on Moreton Island. Detailed investigations of the Social Environment are provided in **Appendix C7: A**. This includes demographic and other social information relevant to the settlements on Moreton Island.

7.5.2 Commercial Fishing

7.5.2.1 Trawl Fishery

The trawl fishery is Queensland's largest commercial fishery. This is also the case within Moreton Bay (defined as the Brisbane Town Resource Cluster, which consists of all commercial fishing businesses located in the towns and communities adjacent to Moreton Bay). It is upon this industry that emphasis is placed in the SIA.

Moreton Bay produces approximately 10.6 percent of the total value of production of the Queensland commercial fishing industry (2001). For 51 percent of fishing businesses operating in Moreton Bay, trawling is the primary fishing activity, followed by netting (39 percent) and crabbing (33 percent). Brisbane TRC accounts for 18 percent of all trawl fishing businesses, 23 percent of crabbing businesses and 21 percent of netting businesses in Queensland. It has the largest number of businesses in the State in these areas (Fenton and Marshall (2001)). Many fishing businesses participate in more than one of these fishing activities in a year.

Fenton and Marshall (2001) developed a comprehensive socio-economic profile of the commercial fishing industry in Queensland and its various commercial fishing areas. They define commercial fishers as trawlers, line fishers, netters, or crabbers, and include Master licence holders as well as crew in their assessment.

Relevant information derived from their profile of businesses active in Moreton Bay is contained in **Tables 7.5a and Table 7.5b**.

Table 7.5a: Brisbane Town Resource Cluster (TRC*) - Summary (2001).

No. of Businesses	No. of Employees	Av. No Employees	Predominant Activity	Mean Years Owned	Mean No. of Boats	Mean Boat Length	GVP (\$'000)	Median GVP	Total GVP (\$'000)
382 (95% C.I., 352-412)	1,070	2.8	Trawling; Line; Crabbing; Netting.	16.6	1.7	8.4	87	12.2	33,167

* A TRC is a cluster of mutually interdependent towns and communities that have relationships to specific areas of marine resource use (in Brisbane's case, Moreton Bay).

NB: Based on survey returns from 41.2 percent of the industry, 8.8 percent of the industry is considered latent, having not been actively engaged in commercial fishing within the last year.

Table 7.5b: Brisbane Town Resource Cluster (TRC*) - Socio-Economic Information (2001).

	Owner-Operator Profile	Employee/Crew Profile
No. of people	382	688
Mean Age	45.2	33.1
Years in Home town	28.3	21.2
Years in Industry	22.1	9.7
% Employed Elsewhere	16.7	46.3
% Own Home	54.5	17.9
% Completed Year 12	21.3	22.4
Percent Married	87.7	47.8
Mean Family Size	3.7	2.1
Total Family Size	1,413	1,445
Mean Income (\$'000)	37	16

Commercial fishing occurs all year round, although the peak months for commercial fishing activity within Moreton Bay are between February and June (Fenton and Marshall (2001)). Some commercial fishing operations are seasonal, such as the prawn season which runs from October/November to May. Squid is fished during winter. Commercial trawlers operate day and night (24 hours a day), 5 day a week (Monday to Friday). It is proposed to undertake dredge operations constantly over a 12 month period, therefore seasonality is not generally a mitigative consideration.

Commercial trawling is generally confined to the deeper channels of Moreton Bay and a strip from the southern end of Bribie Island to Bulwer (north-west Moreton Island). Logbook information from the Queensland Department of Primary Industries and Fisheries CHRIS database that was reviewed as part of the WBM Oceanics Australia (2004) sand

extraction study demonstrated that the spatial resolution of the data was insufficient to determine exactly how much trawl effort and catch is taken from the Middle Banks area.

WBM (2003) identified that in 2002 approximately 7.5 percent of the value of the 'northern Moreton Bay trawl fishery' was caught in the Central and Middle Banks. However, it is understood that the area generally utilised for commercial trawling lies south of the Middle Banks in an area unaffected by the proposed dredge footprint (refer Chapter C1 for the plan showing the dredge footprint and location of the trawl ground).

7.5.2.2 Crab Fishery

Commercial crabbing is undertaken throughout the sand banks of Moreton Bay with the exception of Spitfire, North and those banks to the north west of Moreton Island (WBM 2003). The two crab fisheries relevant to the Middle Banks area of Moreton Bay are the Blue Swimmer Crab Fishery and the Spanner Crab Fishery. Information for this section is summarised from a more comprehensive discussion about these fisheries within Chapter C5.

Blue Swimmer Crab Pot Fishery

In characterising the blue swimmer crab pot fishery in Moreton Bay, the following information is relevant:

- There has been a general shift in the operation of the commercial blue swimmer crab fishery from inshore areas (e.g. within the northern parts of Moreton Bay) to deeper offshore areas (e.g. offshore of Mooloolaba and Caloundra).
- The spatial scale of logbook information from the CHRIS database is insufficient to determine how important the Middle Banks area is for this fishery. The logbook information is only sufficient to determine the blue swimmer crab commercial catch in the Moreton Bay region in general.

- The information obtained from the CHRIS database is shown in **Table 7.5c**.
- The commercial catch figures peak in Autumn months (Mar-Apr) and again in Spring months (Oct) with the lowest catch periods in winter months.

Spanner Crab Fishery

In characterising the spanner crab fishery in Moreton Bay, the following information is relevant:

- The commercial spanner crab fishery is generally an offshore fishery.
- In analysing CHRIS database for information about spanner crab catch, it is likely that the majority of the spanner crab catch recorded in the W37 (Moreton Bay) grid was recorded east of Moreton Island.
- The information obtained from the CHRIS database is shown in **Table 7.5d**.
- Spanner crabs are primarily harvested using 'dilly' type crab pots all year round, except between 20 November to 20 December when this fishery is closed.

Table 7.5c: Blue Swimmer Crab Fishery Information Obtained from CHRIS Database Based on 1 x 30 Minute W37 Logbook Grid (Source: WBM Chapter C5).

Year	Grid	Species	Tonnes	Operators	Days	GVP (AUS \$)
2003	W37	Crab – Blue Swimmer	303	93	8091	\$2.4 million
2002	W37	Crab – Blue Swimmer	329	87	7984	\$2.6 million
2001	W37	Crab – Blue Swimmer	516	96	9146	\$4.1 million

Table 7.5d: Spanner Crab Fishery Information Obtained from CHRIS Database W37 Logbook Grid (Source WBM Chapter C5).

Year	Grid	Species	Tonnes	Boats	Days	GVP (AUS \$)
2003	W37	Crab - Spanner	14.7	5	84	\$51,500
2002	W37	Crab - Spanner	20.5	12	121	\$71,900
2001	W37	Crab - Spanner	22.1	15	132	\$77,400

7.5.3 Tourism and Recreational Use of the Bay

Middle Banks is situated in the 'General Use Zone' of the Moreton Bay Marine Park, enabling a variety of activities to take place. For the purposes of this SIA, it is considered that the main tourism and recreational activities which could potentially be undertaken in the vicinity of Middle Banks are:

- Boat-based recreational fishing;
- Recreational leisure craft/ boating (motorised and yacht), including swimming; and
- Tourism and recreation operations, namely charter boats involved in recreational fishing or ecotourism activities (such as dolphin, whale or dugong watching tours etc), transportation ferry's to Moreton Island or Tangalooma Resort, or dive boat operators.

Similar activities could potentially be undertaken during transit and at the Luggage Point transfer site, as well as some shore based activities such as fishing or general appreciation of water-vistas. It is considered that the desirability of Luggage Point as a location for shore-based recreational pursuits is low due to its land use and environmental qualities.

The extent that Moreton Bay is used as a recreational resource has never been comprehensively assessed.

7.5.3.1 Recreational fishing

In terms of recreational fishing, it is understood that no on-going monitoring is undertaken in Moreton Bay. A number of studies have been undertaken to determine participation in recreational fishing within the Queensland community. Whilst data is unavailable at the South East Queensland level, some extrapolations can be made from the State-wide data. The 2000-01 '*National Recreational and Indigenous Fishing Survey*' identified the following (Henry, G and Lyle, J (eds) (2003) Queensland Government (2003); Fenton, M and Marshall, N (2001) -

- Participation is higher in Queensland than the Australian average. Relevantly however, the 2001 survey identified that within each State, the lowest participation rates were generally associated with capital city residents. Approximately 24.7 percent of the Queensland population over the age of 5 years (0.79 million people) fished at least once a year (19.5 percent national average). However it is noted that the 2004 RFISH survey showed this rate has since declined to 20.6 percent.
- In Queensland, 28.8 percent of households had at least one recreational fisher (24.4 percent nationally). The average number of fishers per fishing household was 2.0 (1.9 nationally).
- The distribution of fishing effort (and catch) amongst recreational fishers is highly skewed. Most do relatively little fishing whilst a proportionally small number are very active. Approximately two thirds of all fishers do so for 5 or less days, while just 3 percent fished for more than 25 days a year. Just 15 percent of fishers were responsible for about half of the overall fishing effort, with the upper 3 percent contributing about 20 percent of the national fishing effort. On average, fishers fished 5.78 days a year (6.13 nationally).
- In Queensland 55 percent of fishing is shore-based, with 45 percent from boats. 14 percent of all households in Queensland owned at least one recreational vessel (11 percent nationally), with the rate rising amongst fishing households to 35 percent (32 percent nationally).
- In Queensland, 60.9 percent of boats are used for fishing (55.3 percent nationally). 45 percent are equipped with depth sounders and GPS equipment. 70 percent of vessels used for fishing are 4 to 5 m in size, 15 percent are less than 4 m and 11 percent are 6 to 7 m in length.
- Membership of fishing clubs or associations amongst recreational fishers was low (4.3 percent nationally, 3.4 percent Queensland).

- Demographically, 66.0 percent of fishers were male (67.8 percent nationally). The 30-44 age group has the largest number of people fishing (for both sexes), although participation rates are highest amongst the 5-14 age group, indicating its social value to families. Participation in fishing progressively declines after 44 years of age.
- The economic impact of fishing in Queensland is substantial, with fishers spending \$320 million a year in Queensland. Fishers spend an average of \$407 a year on fishing related equipment and activities.
- Fishing plays an important role in holidays/ domestic tourism, with 11.2 percent of fishing in Queensland by residents of other states (11.1 percent national average).

It is recognised that an ‘average fisher’ cannot be defined (Henry, G and Lyle, J (2003); Shafer (1969)), with participants coming from a wide variety of socio-economic backgrounds.

It has been estimated that approximately 30 percent of Queensland’s recreational fishing effort occurs in the Moreton Bay region, with approximately 300,000 anglers catching at least 2,000 tonnes of finfish alone (Quinn 1992, noted in WBM 2002). Since 1992 the population of South East Queensland has greatly expanded, however as identified above, participation rates are likely to have declined. As noted by in WBM’s Sand Extraction Study, all areas of Moreton Bay are used by recreational fishermen, although estuaries, beaches and areas adjacent to surf bars are particularly popular.

At the site specific scale, Chapter C5 reports that Middle Banks area is utilised by boat-based recreational fishers targeting pelagic fish including spotted mackerel, various tuna species, cobia and yellowtail kingfish adjacent to the beacons in the shipping channel. The area is known as one of the best areas within Moreton Bay to target these species. Diver whiting may also be targeted in the area, although other areas in Moreton Bay are far more popular for this particular species. Recreational crabbing for blue swimmer crabs using pots also occurs.

7.5.3.2 Tourism

Moreton Bay with its islands, beaches, waterways and wildlife is a key component of the tourism experience in South East Queensland. However, *“the tourism potential of Moreton Bay and its islands has been largely undiscovered”* (Whitmore and De Lacy, 2005). A recent study (Whitmore and De Lacy (2005)) used national datasets to estimate that the number of ‘tourists’ visiting Moreton Bay each year was approximately 1.7 million people. The study adopted a definition for ‘tourists’ of *“those people travelling and staying over night or travelling more than 50 km return on a day trip”*. Consequently this figure includes some of Brisbane’s residents, but excludes those local residents utilising the Bay for recreation, which would be a much greater number of people. Tourists are drawn predominately from the domestic market, with approximately 2 percent of visitor’s international tourists (or 39,000 people each year). Whitmore and De Lacy (2005) identified that the peak months of visitation correspond to traditional holiday periods, that is (in descending order of importance) December, January, April, and September.

Middle Banks is located approximately 4 km due-west of the Tangalooma Wild Dolphin Resort on Moreton Island. The Resort has 134 motel style units, 56 two storey family villas and 96 hotel rooms. In addition, a number of bed and breakfast style tourist developments are situated at Cowan Cowan. A number of water based recreational activities (swimming, kayaking, etc) occur at these locations. A major attraction of Tangalooma Resort is its wild dolphin programme.

7.6 Consultation

A number of public engagement mechanisms were implemented during the preparation of the EIS/MDP, as described in Chapter A6. This has included discussions with the Queensland Seafood Industry Association (QSIA), Sunfish Queensland Inc, Tangalooma Wild Dolphin Resort and Moreton Island residents. Information from these discussions has been considered in the analysis of social impacts.

7.7 Relevant Statutory and Policy Requirements and their Design Implications

These requirements are the same as those discussed in Chapter B9 of the EIS/MDP.

7.8 Assessment

The social impact assessment of the dredging activities considers the analysis of the social environment as well as the information gathered in the public engagement program, and predicts the project's likely impact, both beneficial and adverse, on regional and local communities and social infrastructure (services and facilities).

7.8.1 Potential Impact upon the Amenity of Island Settlements

Moreton Island has a long and important Indigenous and European heritage. There are three small townships established on the Island, of which Cowan Cowan is closest to Middle Banks being approximately 8 km away. A tourist facility, Tangalooma Wild Dolphin Resort (Tangalooma Resort), is also located on Moreton Island, approximately 4 km due-east of Middle Banks. The potential for social impact from the sand extraction phase of the project upon the tourist operations of the Resort is considered later in this report.

This EIS/MDP has considered the potential for the settlements of Moreton Island to be impacted by the sand extraction phase of the project. Such impacts could take the form of amenity-related impacts, namely noise and visual pollution, or the potential for change in local coastal processes leading to increased coastal erosion at inhabited locations. Such erosion if it eventuated would have a number of direct social impacts.

No significant noise, visual or landscape impacts are expected on the Island settlements and there will be negligible social impact in this regard. No noise impact from the dredge is expected at Tangalooma resort (the closest receptor), even at night. The frequency and duration of the dredge's presence at Middle Banks will not be high, which has been considered in this assessment. The potential for amenity-related impacts from dredge operations are mitigated by the following:

- The dredge will be itinerantly located at Middle Banks 3 times each 24 hour period, for a period of two hours each time;
- Large vessels already travel via the East Channel en-route to and from the Port of Brisbane each day and night. The appearance of the dredge will be no different to these vessels;
- Lighting of the dredge at night will have a very minor and localised effect, similar in appearance to other shipping;
- At a distance of 180 to 200 m from dredges noise levels are likely to be less than 50 dB(A) (WBM 2002). Further, a range of traditional dredging noises are not present in suction dredge operations; and
- Distances between the Island settlements and the dredge footprint.

Chapter B11 considers in detail the noise levels likely to be generated by the dredge operations and these issues are further referenced in the Dredge Management Plan Chapter C9.

It is understood that Cowan Cowan is presently experiencing and has historically experienced beach erosion. Investigations undertaken for this EIS/MDP included reviews and surveys of beach profile behaviours (lastly in February 2006) at locations including Cowan Cowan. The erosion mechanism appears to be part of the natural long term evolution of the shoreline. Chapter C3 demonstrates that dredging impacts are negligible and any which occur will be localised within the Middle Banks and will have no impact on the shoreline of Moreton Island. As such, the processes that influence the present shoreline erosion at the township of Cowan Cowan will not be affected in any discernible way by the project, either adversely or beneficially.

7.8.2 Potential Impact upon Commercial Activities in Moreton Bay

Potential social impacts have been considered upon commercial fishing, tourism and extractive industries.

7.8.2.1 Commercial Fishing

Whilst a small industry in terms of the number of people employed, the value of the Moreton Bay catch to the Queensland economy is substantial. The above baseline information suggests that those involved in the commercial fishing industry are vulnerable to any decline in incomes from impacts to their industry, even over the short term. Incomes in the industry are low, with many supplementing their livelihoods with other employment. Dependent family sizes are larger than average. Opportunities to move outside of the industry are likely to be limited due to older age groups and their lower level of educational achievement.

Chapter C5 found that the dredge footprint is not recognised as an important commercial, recreational fishing or trawling ground/location. The dredge footprint will not directly impact seagrass habitats at Middle Banks and water quality modelling (refer to Chapter C4) has demonstrated that the majority of the sediment in plumes generated from the dredge will disperse and settle rapidly. Highly elevated levels of suspended sediment concentrations are confined locally to the immediate vicinity of the dredge area. As the waters in this area are extremely clear, the small quantity of very fine

material disturbed by the dredger will produce some water discoloration that is visible for some distance beyond the dredge area. However, this will be of short duration at any particular location and a nature that is visible, but of very low (essentially undetectable) suspended sediment concentrations.

Chapter C5 also identified informal engagement that was carried out with commercial fishers representative during its preparation. As part of this engagement, commercial trawl fishers expressed concerns regarding the potential for dredging activities to limit or prevent fishing access both during the operational phases of dredging and for a long period after dredging has ceased. Of primary concern is if dredging activities overlap with important trawl grounds, then the dredging activity will lead to the seabed becoming “untrawlable” due to the physical nature of the dredged area (e.g. too steep). The dredge strategy has been specifically developed to address this issue. In this regard, the dredge footprint has avoided the recognised trawl ground to the south of Middle Banks, and the dredge profile will follow the present-day channel alignment of East Channel. This will have the benefits of (i) avoiding important trawl grounds to the south of Middle Banks; and (ii) not creating a distinct dredge hole, but rather re-creating the existing seabed slope.

Consequently, it is considered that the direct social impact on the commercial fishing industry would be negligible and that any residual impacts would be expected to be localised, of short duration and of low magnitude.

This is consistent with the Governments’ 2005 Sand Extraction Study which found that:

“The direct impacts of large-scale sand extraction scenarios such as disturbance to benthic fauna, potential degradation of water quality and impacts on Indigenous cultural heritage and fishing activity are considered to be relatively minor and of a temporary nature”.

Indirectly, economic growth in South East Queensland facilitated by the NPR may benefit the industry in the long term.

7.8.2.2 Tourism

In general terms, the proposed dredging of Middle Banks will have no identifiable effect on the tourism industry's utilisation of Moreton Bay. Importantly however, the development of the NPR and expanded airport capacity will facilitate the continued development of the local tourism industry. This is further considered in Volume A: Background and Need. Tourism brings major economic benefit to Bay communities. Whitmore and De Lacy (2005) very broadly estimate based on their visitation numbers that tourists expend \$400 million each year and are responsible for the generation of 6,000 jobs. This excludes local resident use of the Bay.

Due to the distances separating the uses, it is considered that there will be no impact on the operation of the Tangalooma Wild Dolphin Resort from the dredging of Middle Banks. As reported by WBM in Chapter C5, dredging will not affect the Bay's dolphin population (in terms of food stocks, underwater noise, or turbidity), from which the resort derives benefit.

7.8.2.3 Extractive Industries in Moreton Bay

There are currently three licensed sand extraction operations over Middle Banks, located on the shallower parts of the sand shoals typically in water depths of approximately 5 m. They are licensed to extract a total of 135,000 m³ of sand per year. The NPR dredge operations will be located in a different, deeper area of Middle Banks to the east. The amount of sand available to be taken by these operations will not be affected. Consequently, there will be no impact upon these commercial activities.

7.8.3 Potential Impact upon Recreational Use of Moreton Bay

Moreton Bay is an important recreational resource for the residents of South East Queensland. Potential interaction of the NPR dredging activities with recreational activities could occur primarily at the Middle Banks dredge site, but could also occur at the Luggage Point sand transfer operation in the Brisbane River mouth, as well as during transit between the two locations. The social impact of sand transfer operations is considered in Chapter B9.

7.8.3.1 Recreational Fishing

As most people who fish do so only a few times a year, any impact from the NPR project dredging operations would dis-proportionally be felt by the small number of people which fish regularly. It is considered that those that fish regularly are likely to demonstrate their commitment through association with fishing clubs or representative organisations. Support for such a conclusion is drawn from the 2001 National survey discussed in the baseline section.

In the examination of potential social impact, it is also important to consider why people fish, what fishers seek to gain from participation and how the proposal may influence these values. Henry and Lyle (2003) identified that the motives for fishing included, along with sporting aspects, perceived psychological, environmental and social benefits. This is supported by other research such as Fedler and Ditton (1994). The 2001 National Survey identified that over 90 percent of fishers reported that 'to relax or unwind and to be outdoors' were important to their participation, whilst 82 percent noted the enjoyment or sport of catching fish and 73 percent socialising with friends as important. It is not considered likely that the proposed dredging will alter the experiences recreational fishers value.

Disturbance to recreational fishing activities associated with dredge operations is likely to be minimal and temporary. Boat-based recreational fishing is a highly mobile activity. The likely impact on recreational fish stocks is identified in Chapter C5. As noted in this chapter, many of the fish species present are thought to be opportunistic and resilient to disturbance. As identified by the ecological assessment in Chapter C5, it is not considered likely that recreational catches will be affected.

7.8.3.2 Other Recreational Activities

Impacts from dredging on water-based sports (eg swimming) are expected to be minimal as the Middle Banks is very rarely used for such activities. Scuba diving sites are generally located close to the shore, and are excluded from marked shipping channels (such as the East Channel separating Moreton Island and Middle Banks). The main dive sites in the vicinity are located off the north eastern corner of Moreton Island. However, when rough sea conditions preclude operations, diving can be undertaken within the Bay along the Moreton Island coastline. The closest named dive sites are the Tangalooma Wrecks (on the edge of a sandbank one kilometre north of Tangalooma Resort and located approximately 2,075 m from the dredge footprint), Curtin Artificial Reef (between Bulwer and Cowan Cowan Point, located approximately 5,900 m from the dredge footprint), The Pines (near Bulwer, located approximately 5,900 m from the dredge footprint), and Comboyuro Drop Off (located approximately 11,050 m from the dredge footprint).

Dredging at Middle Banks will not affect these dive sites. As identified in Chapter C4, impacts on diving operations through a reduction in visibility from the dredge plume would be negligible at these locations.

Also considered is the potential for social impact which might accrue on people who may never utilise Moreton Bay but place a value on it for an environmental or other reason. Queenslanders have strong links with their coastal environments and place high value on the maintenance of its environment. In this respect it is noted that the Middle Banks dredge site is located within the General Use zone of the Moreton Bay Marine Park and away from areas of high conservation values such as Ramsar-listed wetlands, declared Fish Habitat Areas and extensive seagrass beds that support turtles and dugongs.

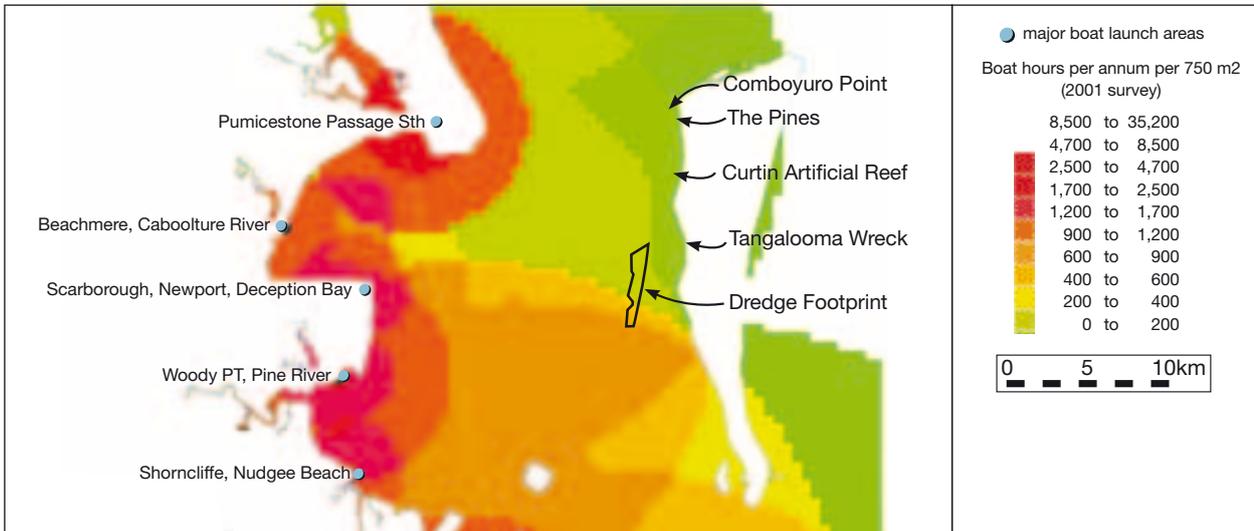
7.8.4 Access

The likely level of interaction between the dredging operations and recreation leisure craft cannot be accurately determined. Surveys have identified that, on average, 14 percent of all households in Queensland own at least one recreational vessel. Data is not available at the South East Queensland or Moreton Bay level from these surveys. As noted above there is a high corollary between boat ownership and recreational fishing participation.

Figure 7.8 identifies the major areas of recreational vessel usage (ie for boating or fishing) in Moreton Bay, based on the number of hours per year (in a 750 m² area) derived by a 2001 survey (Whitmore, M and De Lacy, T (2005)). This identifies that the Middle Banks area receives minimal recreational boating use, supposed primarily to be due to its distance from boat ramps in the region. The survey estimates that a recreational boat is present in the Middle Banks area for between 400 and 600 hours each year. On average, this is about one and a half hours each day boats are present within a 750 m² area around Middle Banks. This is minimal in the context of overall boating use of the Bay demonstrated in

Figure 7.8.

Figure 7.8: Major Areas of Recreational Vessel Usage in Moreton Bay.



Source: Whitmore, M and DeLacy, T. (2005) "Sustainable Development and Management of Moreton Bay", "Sustainable Tourism CRC".

In the consideration of the potential social impact of the proposed dredging upon tourism and recreational activities in Moreton Bay, the critical issue is the degree of conflict which could occur between the various uses at Middle Banks. As demonstrated, the potential for conflict at the Middle Banks dredge site is minimal. Aside from appropriate safety zones related to the general safe passage of vessels, the dredge operation would not be an exclusive use of the Middle Banks area. Consequently, it is considered that the degree of social impact on tourism and recreation activities is negligible.

Two separate vehicle and passenger freight services operate from the mainland over to Moreton Island, the *Moreton Venture* (from Lytton, near the mouth of the Brisbane River) and the *Combie Trader* (between Scarborough and Bulwer). Tangalooma Resort operates three passenger ferrys, which depart from Pinkenba near the Gateway Bridge. None of these transport services will be affected by the dredge operations.

The extraction at Middle Banks will not impact on existing shipping operations in the East or Main Channels, which will remain in operation for vessel traffic throughout the sand extraction operation. While cruising, the dredge captain will abide by all normal shipping protocols and directions from the Harbour Master.

7.9 Cumulative and Interactive Effects

Middle Banks selection as a dredge site follows a recommendation from the Queensland Government's Sand Extraction Study, released in 2005. This study examined the environmental, economic, cultural and social impacts of sand extraction and found that there would be no major environmental impacts associated with even large-scale sand extraction in Northern Moreton Bay.

It is noted that the alternative to the dredging of Middle Banks is the supply of large volumes of fill material from land-based sources. The Moreton Bay Sand Extraction Study identified land based extraction as a contentious community issue which would generate a wide range of localised social impacts. It has been estimated that to achieve the required level of fill for the NPR would necessitate a truck delivery to the Airport site every minute for three years.

The cumulative and interactive effects of other technical investigations have been considered as appropriate. There are no known relevant projects which will act in a cumulative manner on the communities of interest associated with dredging of Middle Banks.

7.10 Mitigation Measures

The critical issue for the proposal in the management of the potential for conflict between the various uses of Moreton Bay, particularly at Middle Banks. The dredge management plan (Chapter C9) details a range of actions which will be undertaken to ensure that the risk of conflict with other users is further minimised through:

- Publishing a notice to mariners (by Maritime Safety Queensland) prior to commencement of the dredging activity outlining where the vessel will be operating and travelling to ensure safe navigation
- Publishing a public notice in relevant newspapers advising potential users about the timing and location of the activities

- Creation of a free call service for feedback and or complaints related to the dredge (noise, light, air emissions, navigation and access issues).

7.11 Residual Effects

Moreton Bay is highly productive and supports a range of industries - the Port of Brisbane, commercial fishing, tourism and recreational activities as well as urban settlements.

It is considered that the likely social impact of the dredging of Middle Banks on these other uses and users will be negligible. Any social impacts which do arise will be minor and temporary in nature.

7.12 Assessment Summary Matrix

Table 7.12: Social Impact – Assessment Summary Matrix.

Impact Name	Description of impact		Description of mitigation measures	Description of residual impact	
	Description in words	Significance criteria		Description in words	Significance criteria
Development of tourism industry	Increased visitation to the Bay due to improved passenger capacity from NPR.	Minor +ve, I, P, LT	No mitigation measures are proposed as there is a net beneficial impact	N/A Impact is minor beneficial	Minor +ve, I, P, LT
User conflict	Conflict between dredge operations and Bay users (commercial and recreational)	Negligible -ve, I, R, ST	Implement actions outlined in the Dredge Management Plan (C9) (i.e.. notice to mariners, telephone service for complaints) to further reduce potential conflicts	N/A Impact is already negligible	Negligible -ve, I, R, ST

Key to Abbreviations

severe, major, moderate, minor, negligible

+ve or -ve (positive or negative)

D, I, C, In (direct, indirect, cumulative, interactive)

P, R (permanent, reversible)

ST, MT, LT (short-term, medium-term, long term)

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